

EPS

Experimental
Psychology
Society

BANGOR MEETING

3-5 JULY 2013

A scientific meeting will be held at the Main Arts Building, Bangor University, College Road, Bangor, LL57 2DG on 3-5 July, 2013. The local organiser is Charles Leek.

Twentieth EPS Prize Lecture Award

Thursday 4 July 6.00pm

Towards a neurocognitive framework for social interaction

Dr Antonia Hamilton, University of Nottingham

Symposium - To accompany the 20th EPS Prize Lecture

Thursday 4 July 3.30pm – 5.30pm

Sensorimotor foundations of understanding others

Organiser: Emily Cross, University of Bangor

Symposium – Local Organiser

Thursday 4 July 9.00am – 12.30pm

Object and face recognition and representation in man and machine

Organiser: Professor Charles Leek, Bangor University

Poster Session

This will be held in conjunction with the drinks reception on Wednesday evening at 6pm in Pritchard-Jones Hall, Main Arts Building, Bangor University. Delegates may put up posters from midday and they may remain up until the end of the meeting on Friday morning.

Platform Presentations

Sessions will be held in Lecture Theatre 3, and Lecture Theatre 4 located in the Main Arts Building, Bangor University on College Road, LL57 2DG. All theatres have data projectors available for Powerpoint presentations. Presenters can either bring their presentations on USB sticks for use with the computers in the lecture rooms (which run Windows 7, Office 2010), or can email them in advance to Angela Nicholls a.nicholls@bangor.ac.uk. If you have any queries about the facilities please email Angela.

The conference dinner will be at 7.30pm on Thursday, 4th July in Pritchard-Jones Hall, Main Arts Building, Bangor University, College Road, LL57 2DG. A booking form is enclosed.

 START OF PARALLEL SESSIONS
*Session A***Lecture Theatre 4**

- 1.30 **Rachel Cooper* and Steffan Kennett** (University of Essex)
Are all face recognition biases the same? Comparing eye movements in own-race and own-university biases
- 2.00 **Nadia Menon*, Richard Kemp and David White*** (University of New South Wales)
Do identity representations mediate unfamiliar face matching performance? Evidence from simultaneous and sequential matching tasks
- 2.30 **Natalie Mestry*, Michael J. Wenger *, Tamaryn Menneer*, Nicholas Benikos* and Nick Donnelly** (University of Southampton,)
University of Oklahoma
ERP Evidence for Multiple Sources of Configural Processing Contributing to the Thatcher Illusion
- 3.00 **Katie L.H. Gray*, Wendy J. Adams* and Matthew Garner*** (University of Southampton) (Sponsor: Julie Kirkby)
Unconscious face processing in a case of prosopagnosia
- 3.30 TEA
- 4.00 **Letizia Palumbo* and Tjeerd Jellema*** (University of Liverpool, University of Hull) (Sponsor: Marco Bertamini)
The role of involuntary emotional anticipation in social perception
- 4.30 **Louise Kirsch* and Emily Cross** (Bangor University)
Grasping How Action Experience Shapes Object Perception
- 5.00 **Felicity D A Wolohan* and Paul C Knox*** (University of Liverpool) (Sponsor: Marco Bertamini)
Inhibitory Control in “Express Saccade Makers”: Performance in the Minimally-Delayed Oculomotor Response Task
- 5.30 **EPS/British Science Association Prize - Amy Gibb*** (Newcastle University)
Defining the lower limit of human pitch perception
- 6.00 POSTERS AND DRINKS RECEPTION – Posters will be displayed and drinks will be served in Pritchard-Jones Hall, Main Arts Building.

START OF PARALLEL SESSIONS

Session B

Lecture Theatre 3

- 1.30 **Kirsten J. McKenzie*** (University of Nottingham Malaysia Campus)
(Sponsor: Ruth Ogden)
Embodiment and Bodily Illusions
- 2.00 **Mark J Horne*, Louise Brown, Ian Deary* and Robert H. Logie**
(University of Edinburgh, Nottingham Trent University)
Differential visual patterns task performance in young and older adults
- 2.30 **Leah Johnstone* and David Carey*** (Bangor University) (Sponsor:
Charles Leek)
Probing manual asymmetries in localisation using targets that vary in
two dimensions
- 3.00 **Xavier Laurent* and Paloma Mari-Beffa** (Bangor University)
Role of Selective Attention and Action on Episodic Memory
- 3.30 TEA
- 4.00 **James A. Grange** (Keele University)
Challenging a Temporal Distinctiveness Account of Task Switching:
Data and a Model
- 4.30 **Daniel Müllensiefen* and Andrea Halpern*** (Goldsmiths,
University of London, Bucknell University) (Sponsor: Lauren Stewart)
The Role of Features and Context in Recognition of Novel Melodies
- 5.00 **Melanie Wulff* and Glyn W. Humphreys** (University of
Birmingham, University of Oxford)
Effects of Broken Affordance on Visual Extinction
- 5.30 **EPS/British Science Association Prize - Amy Gibb*** (Newcastle
University)
Defining the lower limit of human pitch perception
- 6.00 POSTERS AND DRINKS RECEPTION – Posters will be displayed
and drinks will be served in Pritchard-Jones Hall, Main Arts Building.

*Session A***Lecture Theatre 4**

Symposium: Object and face recognition and representation in man and machine
Organiser: Professor Charles Leek

- 9.00 **Charles Leek** (Bangor University)
What can eye movements tell us about the recovery of 3D shape during object recognition in human vision?
- 9.30 **Euan Strachan*** and **J. Paul Siebert*** (University of Glasgow)
Multimodal feature formulation for point based matching in coaligned range and intensity images
- 10.00 **Neil A. Thacker*** (University of Manchester)
Dual component linear interpolation for viewpoint invariant object recognition
- 10.30 COFFEE
- 11.00 **Guillaume Thierry*** (Bangor University)
When does a visual object become a human face in the brain?
- 11.30 **Paul Rosin*** (Cardiff University)
Facial analysis: trustworthiness and backchannels
- 12.00 **Alan Pegna*** (University of Geneva and Geneva University Hospitals)
Visual processing of behaviourally relevant stimuli

End of Symposium

- 12.30 **Victoria J. Williamson, Kelly Jakubowski* and Lauren Stewart**
(Goldsmiths University of London)
Coping with earworms
- 1.00 LUNCH

*Session B***Lecture Theatre 3**

- 9.00 **Joost Rommers***, **Antje S Meyer**, **Peter Praamstra*** and **Falk Huettig*** (Max Planck Institute for Psycholinguistics, Radboud University)
Anticipating references to objects during sentence comprehension
- 9.30 **Antje S Meyer**, **Zeshu Shao***, **Randi Martin*** and **Ardi Roelofs*** (Max Planck Institute for Psycholinguistics, Radboud University, Rice University)
The role of selective inhibition in semantic interference tasks
- 10.00 **Dean P. Wybrow*** and **J. Richard Hanley** (University of Essex)
Eliminating bias in selection criteria reveals equal prevalence of developmental surface and phonological dyslexia
- 10.30 COFFEE
- 11.00 **Betty Mousikou***, **Kevin D. Roon*** and **Kathleen Rastle** (Royal Holloway University of London, New York University)
Activation of phonetic features in masked priming
- 11.30 **Awel Vaughan-Evans***, **Jan Kuipers***, **Guillaume Thierry*** and **Manon Jones*** (Bangor University) (Sponsor: Charles Leek)
Syntax transfers between languages and is rule based
- 12.00 **Dermot Lynott**, **Louise Connell**, **Himanshu Kansal*** and **Kerry O'Brien*** (University of Manchester, Monash University)
Modelling group-level implicit attitudes using linguistic distributional information
- 12.30 **Louise Connell** and **Dermot Lynott** (University of Manchester)
I See/Hear What You Mean: Semantic Activation in Reading Depends on Implicit Perceptual Attention
- 1.00 LUNCH

Session A**Lecture Theatre 4**

2.00 **Andrew Surtees***, **Ian Apperly** and **Dana Samson** (Université catholique de Louvain, University of Birmingham)
I've got your number: Spontaneous perspective-taking in an interactive task

2.30 **Emily S Cross**, **Louise Kirsch***, **Emily Butler***, **Julia Scaife*** and **Alexis Sweetman*** (Bangor University, Radboud University Nijmegen)
Synchrony in the eye of the beholder: The influence of kinematics and gaze cues on social action perception

3.00 TEA

Symposium: Sensorimotor foundations of understanding others
Organiser: Dr Emily Cross

3.30 **Scott Grafton*** (University of California)
Is motor simulation a useful concept?

4.00 **Elisabeth L. Hill** (Goldsmiths, University of London)
Motor development and social functioning in children at-risk of developing autism spectrum disorder

4.30 **Danielle Ropar**, **Amy Pearson***, **Lauren Marsh*** and **Antonia Hamilton** (University of Nottingham)
Cognitive abilities underlying visual perspective taking in children with and without Autism

5.00 **Dana Samson** (Université catholique de Louvain)
How and when do we compute what others see?

End of Symposium

5.30 **EPS Business Meeting** - Members only (**Lecture Theatre 5**)

Comment [hj1]: Why in not 3 or 4?
We'll lose people, nothing g else is in 5?

6.00 **Twentieth EPS Prize Lecture – Dr Antonia Hamilton** (University of Nottingham)
Towards a neurocognitive framework for social interaction
(Lecture Theatre 4)

Session B**Lecture Theatre 3**

- 2.00 **Mark Atkinson***, **Andrew Simpson***, **Paul Skarratt** and **Geoff Cole**
(University of Essex, University of Hull)
Visual attention and movement corepresentation during joint action
- 2.30 **Noreen O'Sullivan***, **Richard P. Bentall***, **Jason Braithwaite**,
Hannah Sharp*, **Warren Smith-Donnellson***, **Roberta Bolda***,
Amy Millward* and **Marco Bertamini** (University of Liverpool,
University of Birmingham)
When sense of self goes AWOL: the rubber-hand illusion in
depersonalization- and hallucination-proneness
- 3.00 TEA
- 3.30 **Ascension Pagan***, **Hazel Blythe** and **Simon P. Liversedge**
(University of Southampton)
Parafoveal pre-processing of word-initial trigrams during sentence
reading: Evidence for flexible coding
- 4.00 **Manon W. Jones***, **Kristina Moll***, **Margaret Snowling** (Bangor
University, University of Graz, University of Oxford)
What automaticity deficit? Dyslexic readers' activation of lexical
information in a RAN-Stroop task
- 4.30 **Ehab W. Hermena***, **Denis Drieghe**, **Sam Hellmuth***, **Simon P.**
Liversedge (University of Southampton, University of York)
Disambiguating Arabic Homographic Verbs during Reading
- 5.00 **Anna Samara*** and **Marketa Caravolas** (Bangor University)
Intact implicit skill learning in dyslexic adults. Evidence from the
Artificial Grammar Learning task
- 5.30 **EPS Business Meeting** - Members only (**Lecture Theatre 5**)
- 6.00 **Twentieth EPS Prize Lecture – Dr Antonia Hamilton** (University of
Nottingham)
Towards a neurocognitive framework for social interaction
(Lecture Theatre 4)

Comment [hj2]: Why not stay in 3 for
this while Antonia gets set up in 4?

*Session A***Lecture Theatre 4**

- 9.00 **Peter J Hills** (Anglia Ruskin University)
The FIAE results in permanent changes to the representation of facial identity
- 9.30 **Rebecca Lawson** (University of Liverpool)
Identifying one or more familiar objects at unusual locations by hand and by foot: haptic shape perception generalises to inputs from unusual locations and untrained body parts
- 10.00 **Filipe Cristino*, Lina Davitt* and Charles E. Leek** (Bangor University)
Stereo-defined depth information facilitates view generalisation in object and face recognition
- 10.30 COFFEE
- 11.00 **Chang Hong Liu, Wenfeng Chen* and James Ward***
(Bournemouth University, Chinese Academy of Sciences, University of Hull)
Achieving expression-invariant face recognition
- 11.30 **Alice Towler*, David White* and Richard Kemp** (University of New South Wales)
The effect of feedback on unfamiliar face matching: A selective improvement for target absent trials in array tasks
- 12.00 **Margaret C. Jackson*** (University of Aberdeen) (Sponsor: Charles Leek)
Eye gaze influences working memory for emotional faces
- 12.30 **Geoff G Cole and Arnold J Wilkins** (University of Essex)
Trypophobia

End of parallel sessions

End of meeting

Session B

Lecture Theatre 3

- 9.00 **Jessica L. Holt* and Jean-François Delvenne** (University of Leeds)
A bilateral advantage in controlling access to visual short-term memory
- 9.30 **Andrea Halpern* and Daniel Mullensiefen*** (Bucknell University, Goldsmiths University of London) (Sponsor: Lauren Stewart)
When Musicians Remember Music Better than Nonmusicians (or Not)
- 10.00 **Lauren Stewart, Diana Omigie* and Marcus Pearce*** (Goldsmith University of London, Queen Mary University of London)
Dissociating Implicit and Explicit Performance in Congenital Amusia
- 10.30 COFFEE
- 11.00 **Gavin Buckingham*, John Haverstock*, Lucia van Eimeren*, Sayra Cristancho*, Ken Faber*, Marie-Eve LeBel* and Melvyn A. Goodale*** (Heriot-Watt University, Western University) (Sponsor: Antonia Hamilton)
Observing errors vs. expertise during surgical training
- 11.30 **Hoi Fei Kwok* and Alan Wing** (University of Birmingham)
Finger kinematics during active touch for tactile pleasantness
- 12.00 **Briony D. Pulford, Andrew M. Colman, and Catherine L. Lawrence*** (University of Leicester)
Explaining Strategic Coordination: Cognitive Hierarchy Theory, Strong Stackelberg Reasoning, and Team Reasoning
- 12.30 **Robin S. S. Kramer* Ulrich W. Weger* and Dinkar Sharma** (University of Kent, Universität Witten/Herdecke)
The effect of mindfulness meditation on time perception

End of parallel sessions

End of meeting

1. **Alex L. Jones***, **Robin S. S. Kramer*** and **Rob Ward*** (Bangor University, University of Kent) (Sponsor: Richard Ramsey)
Attractiveness ideals: Self and other perceptions of cosmetics use
2. **Massimiliano Di Luca*** and **Darren Rhodes*** (University of Birmingham) (Sponsor: Alan Wing)
Time and time again: isochronous sequences create temporal expectations

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3. **Daniela Altavilla***, **Marco Cecchini***, **Paola Aceto***, **Letizia Palumbo*** and **Carlo Lai*** (Sapienza University of Rome, Catholic University of Sacred Heart of Rome, University of Liverpool) (Sponsor: Maarco Bertamini)
The role of the eyes in processing an intact face and its scrambled image: a dense array ERP and low-resolution electromagnetic tomography (sLORETA) study
 4. **Massimiliano Di Luca*** and **Darren Rhodes*** (University of Birmingham) (Sponsor: Alan Wing)
Time and time again: isochronous sequences create temporal expectations
 5. **Ben Dornan***, **Elizabeth Milne** and **Ying Zheng*** (University of Sheffield)
Frontal Theta EEG Activity and the Default Network: A Task-Based Investigation
 6. **Stephanie Dunn***, **Elizabeth Milne**, **Megan Freeth** and **Tom Stafford** (University of Sheffield)
Electrophysiological indices of spatial attention differ in those with high levels of autistic traits
 7. **Erin Hawkins***, **Duncan E. Astle***, and **Kathleen Rastle** (Royal Holloway, University of London, MRC Cognition and Brain Sciences Unit)
Consolidation-dependent semantic influence on word learning in the brain
 8. **Nicholas Hedger***, **Wendy Adams*** and **Matthew Garner*** (University of Southampton) (Sponsor: Valerie Benson)
Physiological responses to visual threat are dependent on awareness
 9. **Philippa Howard***, **Valerie Benson** and **Simon Liversedge** (University of Southampton)
Semantic processing differences in Autism Spectrum Disorder: Evidence from eye movements and reading
 10. **Stacey Hunter***, **Carl Hughes***, **John Parkinson*** and **Michael Beverley*** (Bangor University) (Sponsor: Steven P. Tipper)
Reducing the barrier of technical jargon with the use of SAFMEDS
 11. **Kelly Jakubowski***, **Andrea Halpern*** and **Lauren Stewart** (Goldsmiths, University of London, Bucknell University)
Effects of Exercise-Induced Arousal on Perceived and Imagined Tempi for Familiar Melodies
 12. **Alex L. Jones***, **Robin S. S. Kramer*** and **Rob Ward*** (Bangor University, University of Kent) (Sponsor: Richard Ramsey)
Attractiveness ideals: Self and other perceptions of cosmetics use
 13. **Jenny Josephs***, **Erich Graf***, and **Wendy Adams*** (University of Southampton) (Sponsor: Denis Drieghe)
Masking, but not priming of amplitude statistics in natural image categorisation

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14. **Luis Manssuer***, **Ralph Pawling*** and **Steven Tipper** (Bangor University, University of York)
Learning of face evaluations from identity-contingent predictive gaze-cues: The role of emotion and individual differences as evidenced by facial electromyography
 15. **Bradley Mattan***, **Kimberly Quinn**, **Ian Apperly**, **Jie Sui**, **Pia Rotshtein*** (University of Birmingham, DePaul University, Oxford University, Tsinghua University)
Self in the first and third person: Self-tagging and perspective taking
 16. **Samantha F McCormick***, **Colin J Davis** and **Kathleen Rastle** (Royal Holloway, University of London)
Orthographic effects on speech perception reflect online activation, not phonological restructuring
 17. **Elizabeth Milne**, **Lauren Powell***, **Megan Freeth** and **Elizabeth Sheppard*** (University of Sheffield, University of Nottingham Malaysia Campus)
Cross-cultural differences in perceptual style and their relationship to self-construal
 18. **Letizia Palumbo*** and **Anna Pecchinenda** (University of Liverpool, Sapienza University of Rome)
Implicit preference for smiles: when does asymmetry matter?
 19. **Jessica Pattison White***, **Antonia Hamilton** and **Lucy Cragg** (University of Nottingham)
Social Executive Function
 20. **Ralph Pawling*** and **Steven Tipper** (Bangor University, University of York)
Embodied memory: Reactivating facial mimicry of emotion when viewing neutral faces
 21. **Amy Pearson***, **Danielle Ropar** and **Antonia Hamilton** (University of Nottingham)
Spatial Transformations of bodies and objects in Adults with Autism Spectrum Disorder
 22. **Annie Pye*** and **Patricia E.G. Bestelmeyer*** (Bangor University) (Sponsor: Paloma Mari-Beffa)
Emotion cross-talk: Adaptation to facial expressions affects vocal emotion perception
 23. **Giulia Rampone*** and **Marco Bertamini** (University of Liverpool)
Exogenous Cues affect Aesthetic Evaluation
 24. **Blair Saunders*** and **Ines Jentsch** (University of St Andrews)
Speed-accuracy regulation and error-monitoring as a function of increasing depressive symptoms
 25. **Amanda Louise Shanks***, **Leona McGarrigle***, **Brendan Hore***, **Rachel Oakes***, **Grace Carey***, **Aisling Champion***, **Katie Vickers***, **Carl Hughes*** and **John Parkinson*** (Bangor University) (Sponsor: Steven P. Tipper)
The efficacy of Positive Psychology interventions in primary school children

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26. **Jakke Tamminen, Matthew Davis and Kathleen Rastle** (Royal Holloway, University of London, MRC CBU, Cambridge)
Memory consolidation protects against interference in generalisation of language learning
 27. **Melanie West* and Glyn Humphreys** (University of Birmingham, University of Oxford)
Eye Movements demonstrate top-down control in singleton search
 28. **Lydia Whitaker*, Catherine R.G. Jones, Arnold Wilkins and Debi Roberson** (University of Essex)
Individuals with autism spectrum disorders benefit from the addition of coloured tints when discriminating intensities of facial expressions
 29. **Charlotte Wilkin*, Robert Ward* and John Parkinson*** (Bangor University) (Sponsor: Paloma Mari-Beffa)
Self-deception and illusions of control
 30. **Jill A Williams* and John Parkinson*** (Bangor University) (Sponsor: Charles Leek)
When sixth sense is shortsighted: Detrimental effects of exercise-induced arousal on emotional decision-making on the Iowa Gambling Task
 31. **Jeffrey Wood*, Andrew Stewart and Louise Connell** (University of Manchester)
Read this and I'll pay you a fiver: Eye tracking implicit meaning in conditionals
 32. **Alla Yankouskaya*, Pia Rotshtein* and Glyn Humphreys** (University of Oxford, University of Birmingham, University of Oxford)
Neural correlates of the interaction between processing of identity and emotion in faces: evidence using redundancy gains

Are all face recognition biases the same? Comparing eye movements in own-race and own-university biases

Rachel Cooper* and Steffan Kennett
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The well documented own-race bias in face recognition (e.g., Goldinger, He & Papesh, 2009) is explained either by perception (viewers' lower perceptual expertise for the physiognomy of other-race faces) or social cognition (viewers' motivations vary across in- and out-group faces; Young, Hugenberg, Bernstein & Sacco, 2012). Only social cognition can explain other face recognition biases where groups do not differ physically (e.g., own-university). The degree that social cognition and perception combine to explain the own-race bias is assessed by comparing eye movements leading to the own-university versus own-race bias. Our students completed two face recognition tests using faces of own/other race and own/other university. All faces were previously unknown and were labelled own/other university randomly. Patterns of recognition accuracy confirm the previously reported own-race and own-university biases. Previously untested, differences in eye movements and pupil size were observed for own- and other-university faces. Importantly, patterns of eye-position revealed some bias-specific differences. However, common patterns across both biases of own-group dependent eye movements provide an index of non-perceptual mechanisms shared by these two own-group recognition biases.

Goldinger, S.D., He, Y., & Papesh, M.H. (2009). Deficits in cross-race face learning: Insights from eye movements and pupillometry. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 35(5), 1105-1122.

Young, S.G., Hugenberg, K., Bernstein, M.J., & Sacco, D.F. (2012). Perception and motivation in face recognition: A critical review of theories of the cross-race effect. *Personality and Social Psychology Review*, 16(2), 1-27.

Do identity representations mediate unfamiliar face matching performance? Evidence from simultaneous and sequential matching tasks

Nadia Menon*, Richard Kemp and David White*
University of New South Wales
n.menon@student.unsw.edu.au

Dominant models of human face-processing propose two types of cognitive representation. At one level, image-based *pictorial* representations incorporate information which is specific to a particular encounter with a face. These representations are influenced by factors such as lighting, or facial expression, which are independent of face-identity. In contrast, identity-specific *structural* representations code aspects of an individual's face that remain invariant across encounters, and are therefore useful for face identification. In four experiments, we investigated the extent to which identity-level representations support unfamiliar face matching. Participants were presented with two images of the target identity and told that either; a) the two photos were of the same person (IID condition), or b) the photos were of two different people (2ID condition). Ps then decided if the identity depicted in one or both of the images matched that shown in a

third image. Overall, our results show that the IID manipulation improved performance on *Match* trials, whereas 2ID improved performance on *Mismatch* trials. This pattern held for sequential, but not simultaneous, matching tasks. Therefore, identity-level representations, generated in working memory, appear to influence the amount of variation that viewers are prepared to tolerate between images, when making identity judgments.

ERP Evidence for Multiple Sources of Configural Processing Contributing to the Thatcher Illusion

Natalie Mestry*¹, Michael J. Wenger*², Tamaryn Menneer*¹,
Nicholas Benikos*¹, and Nick Donnelly¹

1. University of Southampton

2. University of Oklahoma

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Recent studies exploring the Thatcher illusion (Thompson, 1980) suggest distinct perceptual and decisional components to the illusion (Cornes et al., 2011; Mestry et al., 2012) as well as the involvement emotion processing mechanisms (Donnelly et al., 2011). In order to establish converging evidence for multiple sources of the illusion we conducted an ERP study examining inversion and the level of Thatcherisation (typical face, eyes Thatcherised, mouth Thatcherised, or both features Thatcherised) on a set of event-related components (the P1, N170, P2 and P3b). Results reveal three effects: (1) inversion effects leading to increased amplitude for inverted faces at the N170 and P2 in the occipito-parietal area; (2) a reduction in N170 amplitude with level of Thatcherisation in the right occipito-parietal area; and (3) inversion effects leading to increased amplitude for inverted faces at P3b in the centro-parietal area. The results suggest converging evidence for multiple sources of configural processing contributing to the experience of the Thatcher illusion.

Cornes, K., Donnelly, N., Godwin, H. J., & Wenger, M. J. (2011). Perceptual and decisional factors influencing the discrimination of inversion in the Thatcher illusion. *Journal of Experimental Psychology: Human Perception and Performance*, 37, 645–668.

Donnelly, N., Zürcher, N. R., Cornes, K., Snyder, J., Naik, P., Hadwin, J. A., & Hadjikani, N. (2011). Discriminating grotesque from typical faces: Evidence from the Thatcher illusion. *PLoS ONE*, 6, e23340.

Mestry, N., Menneer, T., Wenger, M. J., & Donnelly, N. (2012). Identifying sources of configural processing in three face processing tasks. *Frontiers in Psychology*, 3, 456.

Thompson, P. (1980). Margaret Thatcher: A new illusion. *Perception*, 9, 483-484.

Unconscious face processing in a case of prosopagnosia

Katie L.H. Gray*, Wendy J. Adams* and Matthew Garner*
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There is robust evidence that faces emerge from binocular suppression faster than less face-like images (Gray et al., 2013). However, there is no consensus on what drives this unconscious face prioritisation effect. In the present experiment, we explore this effect in an individual with prosopagnosia – his ability to process face identity information is severely disrupted due to cortical lesions. We presented normal and manipulated faces and houses in a continuous flash suppression (CFS) paradigm. Results indicated that the prosopagnosic patient, along with control participants (matched for handedness and approximate age), had significantly faster responses to ‘normal’ (upright, normal contrast) faces compared to ‘manipulated’ (spatially inverted, negative contrast) faces when presented unconsciously using CFS. Thus, we found that the unconscious face prioritisation effect was replicated in a case of prosopagnosia.

Gray, K.L.H., Adams, W.J., Hedger, N., Newton, K.E. & Garner, M. (in press). Face and awareness: low-level, not emotional factors determine perceptual dominance. *Emotion*.

The role of involuntary emotional anticipation in social perception

Letizia Palumbo*¹ and Tjeerd Jellema*²

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2. University of Hull

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Influences of bottom-up perceptual processes to misjudgements of ecologically-valid dynamic facial expressions were contrasted with influences of top-down attributions about the agent’s mental/emotional state. Recently we found that neutral faces displayed at the end of joy or anger offsets were evaluated as being slightly angry or slightly happy, respectively (an ‘overshoot’ response bias). However, a change of identity in the last neutral frame removed the overshoot bias; whereas neutral-to-joy (or anger)-to-neutral sequences produce a distortion which was opposite in direction (‘undershoot’). These results exclude perceptual contrast/context effects, adaptation and representational momentum as possible underlying mechanisms (Palumbo & Jellema, 2013). Another manipulation involving sinusoidal sequences (from joy-to-neutral-to-anger-to-neutral, and from anger-to-neutral-to-joy-to-neutral), did not produce any bias thus excluding the possibility that the overshoot response was due to the detection and extrapolation of a pattern in the dynamic stimuli. We propose that the observation of ongoing changes in the other’s facial expressions leads to involuntary emotional anticipation, a low-level mindreading mechanism, which in turn biases these expressions. Our emotional anticipation interpretation is strengthened by the finding that when variations in facial expressions do not belong to the same individual, or present an ambiguous emotional content, there is no bias in the judgements. The role of emotional anticipation is discussed in relation to the interplay of bottom-up visual processes and top-down (implicit) mechanisms of action/emotion understanding.

Palumbo & Jellema (2013). Beyond Face Value: Does Involuntary Emotional Anticipation Shape the Perception of Dynamic Facial Expressions? *Plos One*, 8, 1-11.

Grasping How Action Experience Shapes Object Perception

Louise Kirsch* and Emily Cross
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Past work suggests that object representations generate action affordances, and such compatibility effects can be clearly seen in response time tasks. However, what remains unknown is how prior experience shapes such automatic and implicit affordances. Here we investigate two populations, expert climbers and non-climbers. Both groups completed the same task: they used their right and left index fingers to make colour judgments on a series of everyday objects and artificial rock climbing holds. The task also included a 1-back memory component, wherein participants had to decide if the presented object was identical to the previously presented object to control for an attentional effect. The main experimental question is whether climbers' prior experience with grasping rock climbing holds modulates the degree to which automatic action affordances are primed. The results show that extensive experience with a certain type of object (i.e., indoor rock climbers' experience with artificial climbing holds) results in strong affordance priming, which is absent among non-climbers. Such data suggest that the original finding of Tucker and Ellis (1998) are not a stable phenomenon, but can be reduced or amplified based on experience.

Tucker, M. & Ellis, R. (1998) On the relations between seen objects and components of potential actions. *Journal of Experimental Psychology: Human Perception and Performance*, 24,3, 830-846.

Inhibitory Control in "Express Saccade Makers": Performance in the Minimally-Delayed Oculomotor Response Task

Felicity D A Wolohan* and Paul C Knox*
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Express saccade makers (ESMs) produce high proportions (>30%) of low latency (80–120ms) express saccades in prosaccade overlap tasks designed to reduce such responses. Their performance on the antisaccade task, which requires inhibition of a reflexive saccade to a target and the programming and execution of a voluntary saccade to the mirror position of the target, is also compromised. This could suggest a selective deficit in inhibitory control. To examine this hypothesis, nine ESMs and eight non-ESMs completed a minimally-delayed oculomotor response task (MDOR). After a randomised fixation time, the fixation target was extinguished and a pro-saccade target appeared for either 200ms or 1000ms. Participants were instructed to maintain fixation and saccade to the target position on target offset. In a control task they saccaded on target onset. While there was a latency modulation with display time across both groups (ESMs 200ms: 400±35ms vs 1000ms: 299±40ms; non-ESMs 200ms: 363±42ms vs 1000ms: 300±33ms; $F(1,15) = 96.6$, $p < .001$, $\eta_p^2 = .86$), there was little evidence of a difference between groups ($F(1,15) = 1.27$, $p = .28$, $\eta_p^2 = .08$) and no difference in error rates (the proportion of premature saccades). These preliminary results are not consistent with a deficit in oculomotor inhibitory control in ESMs.

Embodiment and Bodily Illusions

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Although our somatic experiences seem to reflect reality, many clinical cases exist in which our bodily events are misjudged or misinterpreted, resulting in distorted bodily experiences. Experimental studies have demonstrated that even healthy participants can experience such distorted somatic experiences through simple cross modal manipulations. Here, we aimed to see how manipulating the degree to which a limb is embodied might alter tactile sensitivity and the tendency to experience illusory somatic sensations. Participants were presented with digitally manipulated representations of their own hands using the MIRAGE virtual reality system. In experiment 1, participants were asked to detect the presence of a near threshold tactile stimulus while their right index fingers were presented as visually normal, 'stretched' or 'chopped off'. Though participants still reported ownership of the finger, these manipulations resulted in marked differences in the degree to which participants were able to detect the tactile stimulus and the number of times an illusory tactile stimulus was reported. In experiment 2, participants were divided into 'Low' and 'High' groups based on their tendency to experience medically unexplained symptoms (MUS), and the extent to which top-down (cognitive) or bottom -up (sensory) processes modulated perception was manipulated. Individuals in the High MUS tendency group showed significantly different response patterns in relation to these top down/bottom up manipulations, as compared to the Low MUS tendency group. It is hoped that this distinction between top-down and bottom-up processes in somatic sensory illusions may help elucidate the causes of clinical phenomena such as somatoform disorders.

Differential visual patterns task performance in young and older adults

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Research suggests that individuals approach working memory tasks differently with age (Johnson, Logie and Brockmole, 2010). Brown, Forbes, and McConnell (2006) developed a modified visual patterns task (VPT) with easy-to-name (ETN) and hard-to-name (HTN) pattern sets. In the current study, young (18-25) and older (60-75) adults showed a benefit of 'nameability' on a static memory task. Older adults displayed a 'nameability' effect with dynamic *sequential* presentation. No difference between pattern sets was seen with dynamic *random* presentation. Further analyses of data have shown that the pattern set that is presented first, and the nature of the memory tasks have differential effects on subsequent recall performance in both groups. There is a main effect of 'ETN/HTN seen first' in young adults when static and dynamic *ordered* tasks are presented. Younger adults show improved performance across all tasks when ETN patterns are seen first. When static and dynamic *random* tasks are shown, older adults benefit when HTN patterns are presented first. A tentative hypothesis is suggested where young and older adults will apply differential strategies with older adults tending to use verbal strategies to supplement visual working memory tasks. However, presentation of a

task where strategy use is not easily applicable (such as HTN dynamic *random*) will undermine subsequent strategy use/task performance in older adults.

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Johnson, W., Logie, R. H., & Brockmole, J. R. (2010). Working memory tasks differ in factor structure across age cohorts: Implications for dedifferentiation. *Intelligence* 38 513-528.

Probing manual asymmetries in localisation using targets that vary in two dimensions

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Right-handers tend to make more accurate movements with their preferred hand, unsurprisingly. These dominant hand movements are also completed more quickly and achieve higher peak velocities than those made by the non-dominant hand. What is surprising is that these movements tend to be initiated more quickly with the left, non-dominant hand. These effects are usually interpreted in terms of the right hemisphere providing subtle advantages for its controlled hand. As part of a long-term project examining the mechanisms behind these left hand RT advantages, we decided to increase the visuospatial localisation demands of typical aiming tasks by varying the targets in two dimensions. Thirty dextral participants reached to 40 different target positions for a total of 240 trials per hand. The mean left hand advantage found was 8msec, mimicking that seen in numerous studies that have a small number of targets varying in one dimension. The interesting result was that 77% of the participants showed the effect, compared to the 65% found in several 1d target experiments performed previously by one of us. The implications of this new task for studies of manual asymmetries will be discussed alongside future experiments meant to examine this right hemisphere-left hand system.

Role of Selective Attention and Action on Episodic Memory

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In 1972, Endel Tulving coined the term 'episodic memory,' with reference to the process used to link the many different types of information constituting an event into a spatio-temporal context, which can be retrieved later. In the present talk, I investigate what type of information is encoded in episodic memory while performing selective attention and action tasks. Results across several experimental conditions strongly indicate that memory superiority under passive mode could be related to the incidental encoding of irrelevant information. This effect is mostly found when memory is immediately tested (short delay) and disappears some time later following a retroactive interference task. Distractors competing for an action receive a stronger suppression than those who are not, the results are in agreement with negative priming endogenous studies to prevent them to become the target of the action. The results highlight the role of the

action on episodic encoding demonstrating that using an active state of encoding does not increase the amount of information to encode, but reduces the incident of non-relevant information stored in this trace.

Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), *Organisation of Memory* (pp. 381–403). New York: Academic Press.

Challenging a Temporal Distinctiveness Account of Task Switching: Data and a Model

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Do memory representations for currently-relevant tasks decay over time? Evidence for decay of so-called task-sets comes from manipulating the response–cue interval in task switching, which has been shown to affect the switch cost—the detriment to response time and accuracy when switching compared to repeating tasks. The reduction of switch cost at longer RCIs has been taken as evidence of task-set decay, a view recently challenged by Horoufchin et al. (2011), who suggested manipulating the RCI affects the temporal distinctiveness (TD) of a previous task’s episodic trace—that is, how “isolated” the representation of the task is in memory. This in turn affects the probability of retrieving this episodic trace on the current trial. I have previously shown that an interference-only model based on Brown et al.’s (2007) SIMPLE model of memory fits the complex data pattern attributed to TD well (Grange, 2013). In the present talk, I will present empirical evidence that directly challenges this TD account of task switching, supporting a decay account. This is reinforced by fitting an activation–decay model to the data, based on the ACT-R theory of cognition (Anderson, 2007). It is concluded that TD data can be explained by decay accounts.

Anderson, J.A. (2007). *How can the human mind occur in the physical universe?* New York, NY: Oxford University Press.

Brown, G.D.A., Neath, I., & Chater, N. (2007). A temporal ratio model of memory. *Psychological Review*, 114, 539-579.

Grange, J.A. (2013, April). Testing a SIMPLE simulation of temporal distinctiveness effects in task switching. *Paper presented at the Experimental Psychology Society conference, Lancaster, UK.*

Horoufchin, H., Philipp, A.M., & Koch, I. (2011). The dissipating task-repetition benefit in task switching: Task-set decay or temporal distinctiveness? *Journal of Experimental Psychology: Human Perception & Performance*, 37, 455-472.

The Role of Features and Context in Recognition of Novel Melodies

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We investigated how well structural features such as note density or the relative number of changes in the melodic contour could predict success in implicit and explicit memory for unfamiliar melodies. We also analyzed which features are more likely to elicit increasingly confident judgments of “old” in a recognition memory task. An automated analysis program computed structural aspects of melodies, both independent of any context, and also with reference to the other melodies in the testset and the parent corpus of pop music. A few features predicted success in both memory tasks, which points to a shared memory component. However, complexity of melodic pattern compared to a large corpus of pop music had different effects on explicit and implicit memory. We also found that just a few features are associated with different rates of “old” judgments, whether the items were old or new. Rarer melodic patterns relative to the testset predicted hits and rarer patterns relative to the corpus predicted false alarms. This data-driven analysis provides further support for both shared and separable mechanisms in implicit and explicit memory retrieval, as well as the role of distinctiveness in true and false judgments of familiarity.

Effects of Broken Affordance on Visual Extinction

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Previous studies have shown that visual extinction can be reduced if two objects are positioned to ‘afford’ an action (e.g., Riddoch, Humphreys, Edwards, Baker, & Willson, 2003). Here we tested if this affordance effect was disrupted by ‘breaking’ the affordance – if the objects actively used in the action had a broken handle. Five neuropsychological patients viewed object pairs that were or were not commonly used together (object and tool/two tools/two objects). To disrupt the effect of action relations, we presented object pairs either with or without a broken handle. In line with previous research (Riddoch et al., 2006), recovery from extinction was greater for action-related than for unrelated pairs. Interestingly, the advantage for action-related objects over unrelated tools was apparent only when both handles were intact (unbroken handle condition) but not when the tool handle was broken (broken handle condition). Notable the advantage for action-related objects over unrelated objects was not affected by the handle completeness. In addition, patients reported more pairs when the stimuli were oriented for left-handed (incongruent) than for right-handed (congruent) actions, regardless of the object pair condition. Surprisingly, the effect of hand congruence was absent with broken stimuli. The data provide further support for visual and motor-related responses to affordance, with the effect being sensitive to handle completeness.

Riddoch, M. J., Humphreys, G. W., Edwards, S., Baker, T., & Willson, K. (2003). Seeing the action: neuropsychological evidence for action-based effects on object selection. *Nature Neuroscience*, 6(1), 82-89. doi:10.1038/nn984. Retrieved from <http://dx.doi.org/10.1038/nn984>

Riddoch, M. J., Humphreys, G. W., Hickman, M., Clift, J., Daly, A., & Colin, J. (2006). I can see what you are doing: Action familiarity and affordance promote recovery from

extinction. *Cognitive Neuropsychology*, 23(4), 583-605. Retrieved from
ISI:000237990000004

EPS/British Science Association Prize

Defining the lower limit of human pitch perception

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Pitch, as an auditory percept, has been the focus of intense research in an attempt to understand its properties and locate a neural correlate. Before pitch correlates can be found however, it is necessary to accurately define the limit above which pitch is perceived, allowing conclusions to be drawn as to which neural mechanisms are active at and above this limit. Consequently, this study aimed to define the lower pitch boundary. 41 participants were exposed to pairs of paired stimuli (harmonic complex and click train stimuli) across a range of frequencies (8-128Hz), and required to discriminate in which pair a difference was perceived. Results revealed a lower limit of 30Hz for harmonic complex stimuli and 25Hz for click train stimuli. No significant difference was found between the two values, indicating the lower pitch limit to be consistent across stimuli. However, results indicate that the transition across this lower pitch limit may be represented by an area of partial pitch, rather than a distinct boundary. The results provide a mechanism for future research to identify pitch correlates above the lower limit found, as well as providing a comparison level for defining limits and related neural activity in clinical and non-human populations.

Symposium: Object and face recognition and representation in man and machine
Organiser: Professor Charles Leek

What can eye movements tell us about the recovery of 3D shape during object recognition in human vision?

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In this talk I will show how analyses of the spatial distributions of fixation patterns during object recognition can elucidate the processes, and underlying representations, that mediate shape perception in human vision. In a series of studies using both standard flat-screen and stereo image presentation, we show that fixation patterns are constrained by underlying image features – and in particular, regions of concave curvature minima. These patterns are invariant across levels of stimulus classification during recognition tasks, but do vary between recognition and tasks requiring the planning of prehensile movement. We argue that the computation of surface curvature in 3D objects constrains recognition in human vision for different reasons depending on the task – and that these insights may provide valuable constraints on the development of efficient machine vision and robotics systems.

Multimodal feature formulation for point based matching in coaligned range and intensity images

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Range images or 2.5D depth images are a partial measurement of the 3D structure of an imaged object and comprise the fundamental output generated by systems that infer depth by 3D triangulation. Both the human visual system and modern stereo-photogrammetry systems sense depth through triangulation. 2.5D depth sensing represents an additional modality available to the human visual system, beyond colour and intensity, which aids with environment interaction and task completion. Range images have properties which are better suited for matching under changes in the visual environments typically observed for autonomous systems, such as changes in illumination and 3D pose. Recently there has been an increase in the availability of range scanners and therefore requirement to form suitable measurements of the modality. As such this work presented in this talk aims to integrate the range and intensity imaging modalities, together with state-of-the-art feature extraction approaches, to form stable keypoints localised on an object. The formulated keypoints may be used to establish point-to-point correspondences between an imaged object and prior training examples, or as an improved visual sensor measurement for machine learning algorithms to reason about a visual environment from a single view perspective.

Dual component linear interpolation for viewpoint invariant object recognition

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This paper describes an approach for the representation of projected 3D edge features for purposes of view-based recognition and localisation of objects. It is based upon the representation of arbitrary configurations of features using geometric co-occurrence as Pairwise Geometric Histograms (PGH). Sets of these histograms can be shown to provide a complete representation for arbitrary configurations of fixed 2D projections of 3D shape. Topological considerations allow us to determine the local variation of these descriptors as a function of viewpoint and scale. We describe a mathematical model for the interpolation of correlated changes in these histograms, comprising two independent linear models for use during simultaneous view and scale matching. Mismatch and match distributions are provided to give a context for the accuracy of approximation. An assessment is made of the utility of this approach for object localisation for a selection of real world objects.

When does a visual object become a human face in the brain?

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In 2007, my collaborators and I challenged the established idea that a peak of event-related brain potentials -the N170- is selective to images of the human face. We immediately came under attack from specialists in the field. Since then, we have conducted about 10 studies, replicating and considerably extending our original findings. In this talk, I will present the results of three experiments, which have met with extraordinary resistance (15 rejections and three years of scientific exchanges). Beyond the realm of scientific controversy, our results argue strongly for early categorisation of an object as a face, i.e., within the first 100 ms following image onset and place new constraints on computational models of image classification. At the same time, our results make a compelling case against the N170 as an index of face categorisation. These experiments reveal critical methodological shortcomings in the previous literature: (a) the lack of comparability between experimental conditions in terms of stimulus variability and low-level properties such as contrast and luminosity; (b) the unquestioned use of cropped faces as stimuli, i.e., images of faces that have been extracted out of the head; (c) the use of inadequate control conditions in the testing of face inversion effects.

Facial analysis: trustworthiness and backchannels

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Two sets of experiments are described in which computer vision techniques were used to generate short photo-realistic video clips of animated faces. The first used a

combination of principal component analysis based facial models along with video rewrite to modify the temporal dynamics of smiles, and showed that these produced trustworthy or untrustworthy impressions. Further work considered additional acoustic cues, and used for each speaker versions in which they were instructed to speak in a neutral, trustworthy and untrustworthy manner. The video and audio channels of each encoder's recordings were then digitally aligned using dynamic time warping to obtain audio-video combinations such as trustworthy face + neutral, etc. Results revealed that there is a clear superiority effect of facial over acoustic cues in the formation of trustworthiness impressions. The second set of experiments is concerned with conversation analysis, in which there is an active speaker (frontchannel) and listener (backchannel). The backchannel provides audio and visual feedback signals that can play a vital role in controlling conversational flow. The initial experiments tested the sensitivity to the context and the timing of backchannel responses and show that human conversational skills are highly tuned towards context.

Visual processing of behaviourally relevant stimuli

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Much is known about the dynamics of brain activation that occur after presentation of a visual stimulus. One aspect that has received less attention however is the manner in which the relevance of a stimulus might modify brain activity. Indeed, modulations have been observed in the speed and pattern of activation that appear to be dependant on the importance of the stimulus for the subject. The work presented here considers how patterns of brain activation in humans are modulated by stimulus relevance - presumably to enhance processing of behaviourally important objects and properties of the environment. These observations may be relevant to the development of applications in machine vision.

End of Symposium

Coping with earworms

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Involuntary musical imagery, or 'earworms', describes the phenomenon whereby an auditory image of a musical memory repeats in the mind. Over 90% of people experience this form of spontaneous cognition at least once a week. We explore a key question that has the potential to inform theorizing; what methods are effective in coping with earworms? The present study used qualitative analysis to classify the earworm coping strategies reported by 831 individuals via an international online survey. Grounded theory analysis was run by two independent raters to derive two independent visual descriptive models; 1) Commonly reported earworm coping strategies, and 2) all

coping strategies that were rated as effective. Preliminary results indicate that successful active earworm coping strategies include techniques of musical ‘self-medication’ as well as mental distraction and control practices, such as subvocal dialogue and breathing/meditation practices. We also identified over 50 musical extracts that people report as effective in expunging earworms. These results contribute to cognitive theorizing about the nature of involuntary musical imagery and will form the basis for controlled behavioral tests of earworm coping strategies as well as ecologically valid experience sampling studies of earworm coping in prolific sufferers.

Anticipating references to objects during sentence comprehension

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Listeners often anticipate upcoming words (e.g., Altmann & Kamide, 1999). We examined two aspects of this process. The first aspect concerns the contents of predictions. We investigated whether object shape information can be pre-activated. Participants listened to sentences ending in a predictable word (e.g., "Neil Armstrong was the first man to set foot on the moon.") while their eye movements to visual displays of four objects were tracked. We found that prior to the onset of the predictable word, participants fixated objects with a shape similar to the word's referent (e.g., a tomato) more than visually dissimilar objects, demonstrating that object shape information was pre-activated. An ERP study showed analogous effects on N400 amplitude. The second aspect concerns the mechanisms of prediction. We investigated whether predictive behavior in verbal and non-verbal tasks are related. In addition to the eye-tracking task, participants performed a spatial cueing task (Posner, Nissen, & Ogden, 1978). Participants whose responses were most strongly facilitated by predictive arrow cues in the cueing task also showed the strongest effects of predictable language input on their eye movements. A reaction time study confirmed the correlation. Predictive language comprehension thus appears to involve specific contents and potentially domain-general mechanisms.

Altmann, G. T. M., & Kamide, Y. (1999). Incremental interpretation at verbs: Restricting the domain of subsequent reference. *Cognition*, 73(3), 247-264.

Posner, M. I., Nissen, M. J., & Ogden, W. C. (1978). Attended and unattended processing modes: The role of set for spatial location. In: H.L. Pick, & I.J. Saltzman (Eds.), *Modes of perceiving and processing information*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

The role of selective inhibition in semantic interference tasks

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Recently many authors have stressed that domain-general cognitive processes may affect performance in linguistic tasks. This challenges the traditional view that speaking and listening are fairly modular processes. Going beyond this broad claim, we aim to determine exactly how domain-general processes influence linguistic processes. In the present study we examined the influence of selective inhibition (invoked to suppress responses to potent competitors to target stimuli and taking some time to build up) on performance in two classic word production tasks, the semantic blocking task (naming sets of objects that do vs. do not belong to the same semantic category) and the picture-word interference task (naming pictures accompanied by categorically related vs. unrelated words). Both tasks were completed by the same participants. Analyses of the size of the interference effects for fast and slower responses (using delta plots) and of the correlations of the effect sizes in the two tasks demonstrated that selective inhibition was recruited in both tasks. We propose that the process supported by selective inhibition is lemma selection. We discuss the implications for theories concerning the origin of the interference effects in the two paradigms and the nature of lexical selection processes.

Eliminating bias in selection criteria reveals equal prevalence of developmental surface and phonological dyslexia

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Castles and Coltheart (1993) innovated a regression-based method for identifying individuals with phonological and surface subtypes of developmental dyslexia within a large sample, finding approximately equal numbers of each subtype. Following criticism of the use of a control group matched on age, Stanovich et al. (1997) updated the method to use control groups matched on reading level, and found that surface dyslexics were far less numerous when compared to reading level controls. However, the reading level match has its own problems relating to the type of assessment used to gauge reading level. The current study attempted to resolve these issues by using different control groups based on the dual route model of reading, alongside age-matched and reading level-matched control groups. The results found by Stanovich et al. were replicated for age match and reading level match analyses, but the new method revealed more equal numbers of each subtype, and this supports the notion that cases of phonological dyslexia and surface dyslexia are equally prevalent when bias towards one or the other is eliminated.

Castles, A. & Coltheart, M. (1993). Varieties of developmental dyslexia. *Cognition*: 47, 149-180.

Stanovich, K.E., Siegel, L.S. & Gottardo, A. (1997). Converging evidence for phonological and surface subtypes of dyslexia. *Journal of Educational Psychology*: 89, 114-127.

Activation of phonetic features in masked priming

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Models of reading aloud (e.g. Coltheart et al., 2001) are silent about the processes mediating the activation of abstract codes for sounds and their articulatory implementation in speech. The present work investigated such processes in a masked priming reading aloud task. In Experiment 1, nonword targets preceded by briefly presented masked primes (50ms) were named faster in the onset-related condition (e.g. *pif*-PEZ, where the prime and the target share their first phoneme) compared to the feature-related (e.g. *biv*-PEZ, where the prime's and target's first phonemes share all features bar voicing) and unrelated (e.g. *rog*-PEZ) conditions which yielded similar naming latencies. In Experiment 2, where primes were presented for slightly longer (60ms), both the onset- and feature-related conditions yielded significantly faster target naming latencies than the unrelated condition. These results suggest that orthographic information from subliminally presented letter strings does not only influence early stages of cognitive processing, but cascades all the way down in a time-coursed manner to affect the very late stages of the reading aloud process. The present findings motivate the conceptualisation of a single model of language production that can explain both reading aloud and speech production processes and have important implications for information-processing theories.

Coltheart, M., Rastle, K., Perry, C., Langdon, R., & Ziegler, J. (2001). The DRC model: A model of visual word recognition and reading aloud. *Psychological Review*, *108*, 204–256.

Syntax transfers between languages and is rule based

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Bilinguals unconsciously activate properties of both their languages, even in a monolingual setting. However, it is currently unknown whether bilinguals processing sentences in one language (e.g., English) activate and apply syntactic rules of their other language (e.g., Welsh). In this pilot study, we presented early Welsh-English adult bilinguals with English sentences. The final word was either correctly or incorrectly mutated according to Welsh mutation rules (e.g., “concert” was mutated into “goncert”, or incorrectly into “doncert”), and presented in a sentence context that either would or would not elicit a word-final mutation, had it been presented in Welsh. Event-related potential recordings demonstrated that correct mutations resulted in significantly attenuated N400 peaks as compared to incorrect mutations. Surprisingly, this difference only occurred during sentence contexts that would elicit a word-final mutation in Welsh. Welsh mutation rules were thus applied in an English context despite the non-existence of such rules in English. Crucially, these rules were also applied when the English word and its Welsh translation did not share an initial consonant (e.g., “test” mutates to “dest”,

however its translation *p*rawf mutates to *h*rawf). Bilinguals therefore transfer language-specific syntactic rules between languages via abstract rule-based knowledge.

Modelling group-level implicit attitudes using linguistic distributional information

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Psychologists have long used implicit measures of judgement to uncover people's attitudes, particularly for sensitive topics where people are less likely to provide honest responses to explicit questions. Over the last 15 years, the implicit association test (IAT) has proved one of the most popular methods of establishing whether people show a bias towards or against particular target concepts in many domains, including racism and gender bias. In previous work, we employed measures of linguistic distributional information (i.e., N-gram frequencies across a large corpus) to model response patterns in language comprehension and conceptual processing tasks (e.g., conceptual combination, property verification – Connell & Lynott, 2013; Louwerson & Connell, 2011). Here, we consider whether the patterns of bias uncovered by the IAT might also be predictable using the linguistic distributional characteristics of the target concepts and associated attributes. We calculated IAT bias scores using data from twenty published IAT studies (N = 2507) and compared these scores to "linguistic" bias scores, calculated using stimuli from the IATs and linguistic distributional information from the Web 1T corpus. The Web 1T is a 5-gram corpus of 1 trillion words culled from Google-indexed webpages. Overall, we found a surprisingly strong relationship between the human and linguistic data, suggesting that group-level attitudes and biases are predictable using linguistic distributional information. In this way, the language to which we are exposed may shape our attitudes and therefore our responses in implicit tasks such as the IAT. We consider some options for further developing and testing this approach.

Connell, L., & Lynott, D. (2013). Flexible and fast: Linguistic shortcut affects both shallow and deep conceptual processing. In press, *Psychonomic Bulletin & Review*.

Louwerson, M., & Connell, L. (2011). A taste of words: Linguistic context and perceptual simulation predict the modality of words. *Cognitive Science*, 35, 381–398.

I See/Hear What You Mean: Semantic Activation in Reading Depends on Implicit Perceptual Attention

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Accounts of visual word recognition allow semantic information to facilitate performance but have hitherto neglected the role of modality-specific perceptual attention in activating meaning. Consistent with the view that perceptual and conceptual systems share attentional resources (Connell & Lynott, 2012), we predicted that modality-specific

semantic information would differentially facilitate lexical decision and naming, depending on how perceptual attention is implicitly directed by each task. Analysis showed the perceptual modalities involved in representing a word's referent concept influence how easily that word is recognized. Both lexical decision and word naming tasks direct attention towards vision, and are faster and more accurate for strongly-visual words. Word naming additionally directs attention towards audition, and is faster and more accurate for strongly-auditory words. Furthermore, the overall size of the semantic effect is as large for naming as lexical decision and is separable from age-of-acquisition effects. Implicitly directing perceptual attention towards a particular modality facilitates representing modality-specific perceptual information in the meaning of a word, which in turn contributes to the lexical decision or word naming response.

Connell, L., & Lynott, D. (2012). When does perception facilitate or interfere with conceptual processing? The effect of attentional modulation.. *Frontiers in Psychology*, 3(474), 1-3.

I've got your number: Spontaneous perspective-taking in an interactive task

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Young children perform particularly poorly on tasks that ask them to judge *how* an object looks to someone else (Flavell et al., 1981). In a recent study (Surtees et al., 2012), we found that this kind of perspective-taking was subject to egocentrism and did not occur automatically, even in adults. This suggests that these judgements are relatively demanding. Research on joint action has shown that completing a task with another person can change the way we represent it (Böckler et al., 2011). We examined whether people would incidentally adopt someone else's perspective in a joint task situation. Adults completed an identical numerical judgement task either alone or sat opposite a partner. The numbers they judged could either be "consistent"- the numbers 5 and 8 that looked identical if viewed upside down, or "inconsistent"- the numbers 6 and 9 that looked like one another if viewed upside down. Single participants performed equally well on all the numbers. Paired participants, however, were slower in their responses to the inconsistent stimuli. The simplest explanation of this is that they were incidentally sensitive to their partner's point of view. We suggest that even relatively demanding perspective-taking can occur spontaneously in the right motivational circumstances.

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Böckler A., Knoblich G., Sebanz N. (2011). Giving a helping hand: effects of joint attention on mental rotation of body parts. *Experimental Brain Research*, 211, 531-545.

Surtees, A. D. R., Butterfill, S. A., & Apperly, I. A. (2012). Direct and indirect measures of Level-2 perspectivetaking in children and adults. *British Journal of Developmental Psychology*, 30, 75-86.

Synchrony in the eye of the beholder: The influence of kinematics and gaze cues on social action perception

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A large proportion of our social behavior is characterized by coordinated movement with others. The perception of social interactions is less well understood. Some evidence demonstrates that observing others moving in synchrony leads to the perception of greater social connectedness. Another important factor modulating perception of social connectedness is agents' focus. It remains unknown, however, how movement synchrony and focus interact at behavioral and brain levels. We investigated with videos featuring two dancers in a two (movement synchrony: yes/no) x two (focus:

toward/away from other) factorial design. Participants ranked the dancers on how socially connected they appeared. Data demonstrate robust main effects of synchrony and focus; participants ranked the dancers as more socially connected when facing each other and/or moving synchronously. Another sample of participants underwent fMRI while performing the task. The imaging data revealed activation of parietal and occipitotemporal regions when the dancers faced each other, and greater superior temporal sulcus activity when they moved asynchronously. These findings suggest that individual cues to social connectedness are processed separately. These findings help clarify how different social cues, such as synchrony and focus, impact our perception of social units, which in turn advances understanding of mechanisms underlying pro-social behavior in general.

Symposium: Sensorimotor Foundations of Understanding Others
Organiser: Dr Emily Cross

Is motor simulation a useful concept?

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A tenet of action understanding is that covert motor simulation is used to facilitate the decoding of observed behaviour. This is motivated by imaging studies demonstrating activity in motor areas during action observation that is experience dependent and studies of motor cortex excitability. Presumably this process leverages a motor simulation process for action selection or planning. This motivates a key question: Does the brain actually use motor simulation to solve goal directed motor planning problems with kinematic complexity? The strongest evidence for motor simulation stems from reaction time delays in action selection reflecting biomechanical constraints. However, recent studies show that biomechanically shaped delays are unrelated to problem solving or motor simulation. Novel experiments of imagined object grasping and manipulation show how chronometric delays are insensitive to the kinematic details that are essential for selecting the correct action. There is little evidence that imagined movement can actually solve problems with kinematic complexity. Putative motor simulation is related to other processes, including multisensory calibration, locating self in space, object rotation and mapping hands onto objects. This calls into question the role of motor simulation as a problem solving mechanism and places a higher burden of proof for using covert movement reconstruction in action understanding.

Motor development and social functioning in children at-risk of developing autism spectrum disorder

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Recently researchers have identified that early motor skills (e.g., sitting, crawling, walking) support the development of other abilities such as language, school achievement

and social interaction. The study employed a longitudinal prospective design to assess the development of motor skills of twenty children at increased risk of developing Autism Spectrum Disorder (ASD), who were recruited and tested at 9 and 40 months old, on the basis of having an older sibling diagnosed with the condition. All children completed a range of motor, face processing, IQ and diagnostic assessments at a follow-up visit (aged 5-7 years), providing a detailed profile of development in this group from a number of standardised, parental report and experimental measures. A higher proportion of children than expected demonstrated motor difficulties at the follow-up visit, and those highlighted by parental report as having poor motor skills as infants and toddlers were also more likely to have lower face processing scores and elevated autism-related social symptoms at follow-up, despite having similar IQ levels. These data lend support to the argument that early motor difficulties may be a risk factor for later motor impairment as well as differences in social communication and cognition, traits that are related to ASD.

Cognitive abilities underlying visual perspective taking in children with and without Autism

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Visual perspective taking (VPT) is the ability to appreciate what the world may look like from another person's point of view. Previous research has shown individuals with Autism Spectrum Disorder (ASD) have difficulty with perspective taking and that it may be linked to mentalising ability (Hamilton, Brindley, & Frith, 2009; Perner, Frith, Leslie & Leekam, 1989). However, VPT can be influenced by a number of factors, and our current understanding about the cognitive mechanisms involved in VPT are still very limited. The present study explores VPT ability in children with and without autism and various skills thought to underlie this ability [i.e. body representation understanding, mental rotation, social ability (SAS), and verbal ability]. Regression analyses showed that VPT performance was significantly predicted by age, verbal ability and body representation in the typically developing group; and in the ASD group it was predicted by verbal ability and mental rotation. The results suggest different skills underlie VPT in the two groups and that difficulties with body representation may contribute to VPT difficulties in ASD.

How and when do we compute what others see?

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Understanding what other people see plays a crucial role in our social interactions. It provides valuable information to understand other people's desires, intentions, knowledge and beliefs. I will present the empirical evidence from a programme of research investigating which types of stimuli and situations "afford" the computation of what other people see and which types of cognitive (and neural) processes are deployed to compute what other people see. I will address the question of automaticity, the distinction between perspective calculation vs. perspective selection,

and the distinction between level 1 vs. level 2 visual perspective taking (i.e., computing whether something is seen vs. how something is seen).

End of Symposium

Visual attention and movement corepresentation during joint action

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Over the last decade there has been an increasing interest in the cognitive processes that underlie acting alongside others. One phenomenon to emerge from such joint action research is the slowing of responses to locations that another person has just acted upon. This behavior has been termed ‘social inhibition of return’ (IOR) reflecting the notion that the effect is due to attentional and inhibitory mechanisms. Others however argue that the effect is a consequence of motor corepresentation that occurs during the observation of action. Three experiments tested these competing accounts. Pairs of participants took turns to make goal directed actions to targets presented on a shared work surface. Experiments 1 and 2 demonstrated that although each participant made *identical actions*, social IOR was modulated by visual manipulations known to affect the basic IOR phenomenon. Experiment 3 showed that when each participant performed *different actions*, social IOR was still observed. These findings support the hypothesis that the response slowing effect is due to IOR processes than to a corepresentation of actions.

When sense of self goes AWOL: the rubber-hand illusion in depersonalization- and hallucination-proneness

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Using the rubber hand illusion (RHI), perceived ownership and an objective measure of agency were assessed in the context of addressing the mechanistic basis of two clinically relevant constructs: depersonalization and hallucination-proneness. A feeling that the self is unreal is central to depersonalization, and hallucinations represent the tendency to attribute internally generated speech to an external source. Recently, through questionnaire studies, it has been argued that these constructs are related (e.g. Perona-Garcelén et al., 2012), though very little is known of the mechanistic basis of depersonalization. On the basis of phenomenology, we reasoned that depersonalization stems from having a reduced sense of agency, and that hallucinations are related to difficulties in identifying ownership. The RHI was induced through the stroking procedure (Botvinick & Cohen, 1998). Results showed that depersonalization was

related to proprioceptive drift following synchronous stroking, even when asynchronous drift, the perception of ownership over the fake hand, and hallucination-proneness, were controlled for. Hallucination-proneness was related to perceived ownership, following synchronous stroking in particular, even when perception of ownership following asynchronous stroking, synchronous drift, and depersonalization, were controlled for. The findings confirm a dissociation between perceived ownership and agency, and they illuminate the association between depersonalization and hallucinations.

Parafoveal pre-processing of word-initial trigrams during sentence reading: Evidence for flexible coding

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Although previous research has shown that letter position information for the first letter of a parafoveal word is coded less flexibly than internal or final letters (Johnson, Perea & Rayner, 2007; White et al., 2008), it is not clear how positional encoding operates over the initial trigram. This experiment explored adult readers' pre-processing of letter identity and position information of a parafoveal word's initial trigram using the boundary paradigm during sentence reading. Seven parafoveal previews were generated for 6-7 letter target words: Identity (*captain*); transposed letter (TL) and substituted letter (SL) nonwords in position 12 (*acptain* vs. *imptain*); in position 13 (*pactain* vs. *gartain*); and in position 23 (*cpatain* vs. *cgotain*). First and single fixation durations, and gaze durations showed a robust transposed letter effect for letters in positions 12 and 23 (but not for 13). Furthermore, reading times between the identity and either TL 12, or TL 23 conditions did not differ, showing that TL previews pre-activate their base word. We conclude that positional letter information for the word's initial trigram is coded in a flexible way through contextual information (bigrams) supporting contextual positional coding models such as Open Bigram (Grainger et al., 2006) or SERIOL (Whitney, 2001).

What automaticity deficit? Dyslexic readers' activation of lexical information in a RAN-Stroop task

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Reading fluency is often indexed by Rapid Automated Naming speed (RAN), which measures the automaticity with which familiar stimuli (e.g., letters) can be retrieved and named. Dyslexic readers are thought to be *less* automatized in lexical retrieval, reflected in consistently slower RAN times compared with non-dyslexics. We compared the automaticity with which adult dyslexic and non-dyslexic readers activated lexical representations in a novel RAN-Stroop task directly. In a 10 x 4 array of letters, specific letter fonts changed colour from black to (e.g.) green (upon fixation). The participant was required to rapidly switch from naming the letter to naming the letter colour. In line with Stroop logic, slower colour naming reflects interference from

automatic, bottom-up lexical processing. If dyslexics' slower RAN times reflect less automatized lexical retrieval, we would expect less of a Stroop effect on dyslexic gaze durations and eye-voice spans compared with non-dyslexics. In fact, we found the opposite pattern: The Stroop manipulation further increased dyslexic gaze/naming times, which increased further still when the letter's orthographic or phonological features were primed. These surprising findings suggest that dyslexics do not have an automaticity problem in RAN. Slower RAN may instead reflect post-lexical decision processes in identifying correct representation(s).

Disambiguating Arabic Homographic Verbs during Reading

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Arabic vowel sounds are conveyed by diacritics, which allow for accurate word pronunciation. Predominantly, modern Arabic is printed without diacritics. Readers typically use context to disambiguate homographs, with diacritics assigned to otherwise ambiguous words. We investigated the time course and effects of accessing diacritics-based phonology to disambiguate homographic verbs which are heterophonic in active compared to passive voice (e.g. *برض* /daraba/, hit; *برض* /doriba/, was hit). We tracked the eye movements of 25 native Arabic readers while reading these sentences in 5 conditions: active, or passive, fully- or non-diacritised, or with verb-only diacritisation in passive. Without diacritics on the verb, readers would not be able to discriminate the passive voice from the active until they reach a prepositional phrase (one word e.g. *ديب* /bijad/, by the hand of) later in the sentence. Results will be discussed detailing the impact of verb-only and full sentence diacritisation, including evidence that readers effectively extracted the phonological information conveyed by diacritics on the verb: Early looking times on the disambiguating region were significantly reduced in the verb-only diacritisation condition. By accessing passive verb phonology, the readers avoided mis-parsing the verb as active (which, in all likelihood, is their default parsing preference).

Intact implicit skill learning in dyslexic adults. Evidence from the Artificial Grammar Learning task

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It has been suggested that deficits in implicit skill learning may partially account for dyslexic individuals' poor reading and spelling (e.g., Ise et al., 2012). We tested this hypothesis in dyslexic adults ($n=46$) and IQ-matched controls ($n=65$) by means of two (linguistic/ non-linguistic) Artificial Grammar Learning tasks adapted from Kinder and Lotz (2009). Participants were presented with 96 "grammatical" sequences (8 repetitions/sequence) and were asked to memorize and reproduce them. Following completion of the memory phase, a well-formedness task was used to assess learning of i) positional

information (e.g., F can only appear in Position 1 and 4), ii) legal bigram/trigram information (e.g., F can be followed by B, not C), and iii) entire training sequences. Our analyses revealed no differences in classification accuracy as a function of group or type of material. Both dyslexic and typical readers classified sequences on the basis of bigram/trigram information at above chance levels and outperformed a group of untrained controls. Analyses of endorsement rates revealed no group differences in the acquisition of positional information or sensitivity to entire training sequences, both of which reliably influenced classification performance. Our results suggest that dyslexics' literacy deficits are not associated with impaired implicit skill learning.

Ise, E., Arnoldi, C. J., Bartling, J., & Schulte-Körne, G. (2012). Implicit learning in children with spelling disability: Evidence from artificial grammar learning. *Journal of Neural Transmission*, 119, 999-1010.

Kinder, A., & Lotz, A. (2009). Connectionist models of artificial grammar learning: what type of knowledge is acquired? *Psychological Research*, 73, 659-673.

EPS Prize Lecture

Towards a neurocognitive framework for social interaction

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Human social interaction is a complex and dynamic process, which is not easy to study or to control. In recent years, there have been important advances in methods and interesting new results which herald rapid advances in this area. It is critical that our cognitive theories of social interaction keep pace with these changes, and are able to guide future research in valuable directions. In this lecture, I outline some of the features which a neurocognitive model of social interaction should have, and how such a model might draw on other domains of psychological research. I review the STORM (social top-down response modulation) model and highlight important future directions for the cognitive study of social interaction.

The FIAE results in permanent changes to the representation of facial identity

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Prolonged exposure to a particular face results in a face identity after effects (FIAEs) whereby sensitivity to that face is markedly reduced subsequently. Face after effects are known to be rather short-lived in unfamiliar faces (lasting approximately 4s) but significantly longer in familiar faces (Carbon & Leder, 2005). In the present study, the duration of the FIAE was explored for familiar and unfamiliar faces. Images of two faces were morphed together. Participants judged the identity of these morphs to establish a baseline identity threshold. Subsequently, participants were adapted to one of the faces in the morph and the identity threshold tested again. Significant FIAEs were observed for famous faces and unfamiliar faces. The identity threshold was then tested 2 months later and 6 months later. The FIAE persisted for famous faces, even if the image of the used did not match that of the adaptor image. These results are interpreted as supporting the notion that adaptation causes permanent and stable changes to the representation of facial identity.

Carbon, C. C. & Leder, H. (2005). Face adaptation: Changing stable representations of familiar faces within minutes? *Advances in Experimental Psychology*, 1, 1 – 7.

Identifying one or more familiar objects at unusual locations by hand and by foot: haptic shape perception generalises to inputs from unusual locations and untrained body parts

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The flexibility of our 3D shape recognition system to identify objects by touch alone was investigated by testing exploration at unusual locations, using untrained effectors and for two objects simultaneously. In Experiment 1 there was no advantage to naming pairs of everyday objects if both were explored simultaneously relative to feeling each object sequentially. In Experiments 2 and 3 people were no better at identifying real objects, plastic 3D models of objects and raised line drawings in front of themselves than when exploration was behind their back. Experiment 4 compared one handed, two handed, one footed and two footed haptic object recognition of familiar objects. Recognition by foot was slower and much less accurate than recognition by hand. Nevertheless, item difficulty was similar across hand and foot exploration and foot recognition was better with the largest items suggesting that physical limitations hampered exploration by foot. Thus object recognition by the hands generalised efficiently across spatial location but could not proceed in parallel whilst recognition by foot seemed surprisingly good given that no prior training was provided. Recognition by active touch (haptics) can access stored representations of familiar objects efficiently from novel inputs but only for one input at a time.

Stereo-defined depth information facilitates view generalisation in object and face recognition

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In this study we used a classical classic object recognition paradigm to examine the contribution of stereo depth information to view generalisation. The participants learned and subsequently discriminated a set of 3D stimuli (multi-parts objects and faces) under monocular or stereo viewing conditions. The view generalisation effect was modelled using d' . The learned stimuli were presented from either the same three viewpoints as shown in the learning phase or different viewpoints falling between the trained views (Interpolated) or outside of the trained views (Extrapolated). In three experiments we manipulated viewpoint rotation magnitude (120° , 60° or 30°), viewpoint axis (interchanging the interpolation and extrapolation axes), and stimuli type (using faces instead of objects) respectively. A total of 162 participants took part in this study, the results provide clear evidence of non-generalisation across viewpoints where accuracy is always better at the learnt viewpoints than at the interpolated ones whilst extrapolated viewpoints are the most difficult to discriminate. Here we demonstrate that stereo defined depth information can facilitate view generalisation. A meta-analysis across experiments showed that view generalisation is worst at larger viewpoints but stereo defined depth is most useful at these viewpoints.

Achieving expression-invariant face recognition

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Facial expression is a major source of image variation in face images. A fundamental challenge for an observer is to link numerous expressions to the same face identity. At present it is largely unknown what kind of exposure to expressions of a face is critical for image-invariant face recognition. We examined this issue in a recognition memory task, where the number of facial expressions of each face being exposed during a training session and the presence of dynamic information were manipulated. Observers were either trained with multiple expressions or a single expression, and the images were either dynamic or static. Later participants were asked to identify the trained faces with a novel expression. We found that recognition accuracy after learning one expression was as good as learning three expressions in the dynamic condition, whereas a benefit of learning three expressions was found in the static condition. The dynamic condition also enjoyed similar benefit when the number of trained expressions was increased from three to five. Additional experiments revealed that confusable expressions tend to generalise better to each other. These findings suggest that the key factors for achieving expression-invariant face recognition are maximum variations across types of expressions and dynamic information.

The effect of feedback on unfamiliar face matching: A selective improvement for target absent trials in array tasks

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People are poor at matching identity across photographs of unfamiliar faces. However, recent research suggests that providing feedback on same/different matching decisions improves performance on this task. In three experiments, we examined whether feedback also benefits performance on array matching tasks. In Experiment 1, providing response feedback improved accuracy on a same/different task, where multiple images of a target were presented alongside a comparison image. Feedback improved identity verification accuracy on this task, but only for Mismatch trials. In Experiment 2, participants were given a one-to-four face matching task, where one image of a target identity was presented above an array of similar looking faces. Feedback on this task improved accuracy on Target Absent (TA) trials independently of Target Present (TP) trials. In Experiment 3, participants were given a one-to-five face matching task where they either: i) received feedback only on TP trials, ii) received feedback only on TA trials, or iii) received no feedback. Feedback on TA trials improved performance only on TA trials, whilst the opposite pattern was observed for TP feedback. Together, these results provide further evidence for independence of processes supporting performance on target present and target absent trials in unfamiliar face matching tasks.

Eye gaze influences working memory for emotional faces

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Working memory (WM) for person identity information is enhanced when faces with direct eye gaze are angry versus happy or neutral. Other work shows that angry faces are processed less rapidly and perceived as being less angry when they display averted compared to direct gaze. The goal of the current study was to investigate whether averting eye gaze modulates the anger-enhancement effect in WM. Two angry or happy male faces were presented for encoding into WM. After a short maintenance interval, a single neutral face was presented for retrieval and participants made an identity 'match' or 'non-match' response. Crucially, all faces in each trial either had direct or averted gaze (50% of trials each). Emotion and gaze were task-irrelevant. Contrary to expectations, WM for angry faces was not significantly modulated by gaze direction. However, WM for happy faces was significantly enhanced when gaze was averted versus direct, resulting in significantly better WM for happy than angry averted gaze faces. Analyses of reaction times showed the exact same pattern of advantage for happy averted gaze faces. No significant effects of participant gender were observed. Findings are discussed in terms of how emotion and gaze information is combined to infer social intent.

Trypophobia

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Phobia can be defined as an irrational fear of certain situations or objects, and identifying the cause of such aversion is difficult. We describe a common if somewhat unusual phobia (trypophobia), as yet unreported in the peer-reviewed literature, in which sufferers are averse to images of holes. We performed a spectral analysis on a range of tryophobic images, specifically examining contrast energy at different spatial scales. We found that the stimuli possess a particular visual characteristic known to occur in other images that induce visual stress, that is, high contrast energy at mid-range spatial frequencies. Significantly, we also found that poisonous animals also possess this spectral property. We will therefore argue that tryophobia arises because the inducing images share a basic visual property with poisonous organisms. This property can be computed before recognition occurs via fast acting low-level mechanisms.

A bilateral advantage in controlling access to visual short-term memory

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Recent research on visual short-term memory (VSTM) has revealed conflicting findings about the existence of a bilateral field advantage (BFA - i.e., better memory when the items are distributed in the two visual fields than if they are presented in the same hemifield). Here, we investigated whether a BFA in VSTM is constrained by attentional selective processes. Participants completed a colour change detection task whereby target stimuli were presented either across both hemifields or within one single hemifield. In order to engage attentional selective processes, some trials contained irrelevant stimuli that needed to be ignored. Targets were selected based on spatial locations (Experiment 1) or on a salient feature (Experiment 2). In both cases, the results revealed a BFA only when irrelevant stimuli were presented amongst the targets. Overall, the findings suggest that attentional selective processes at encoding can constrain whether a BFA is observed in VSTM.

When Musicians Remember Music Better than Nonmusicians (or Not)

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Expertise effects in memory have been commonly reported in many domains (typically using visual information) but are surprisingly difficult to find in music. We examined recognition and implicit memory for simple melodic material, comparing musicians to nonmusicians and memory for both well-known and novel tunes. We separated Remember from Know responses in recognition. We found memory superiority

among the musicians only in the explicit test and only for Remember responses in that test. This superiority did not interact with pre-experimental familiarity of the materials. We conclude that at least in this auditory domain, the locus of expert superiority is confined to the conscious reinstatement of the encoding episode.

Dissociating Implicit and Explicit Performance in Congenital Amusia

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Individuals with congenital amusia have lifelong difficulties in perceiving music; often failing to recognize culturally familiar tunes or to spot salient melodic violations in novel tunes. Much empirical work has used tasks requiring explicit judgments (eg same/different) where conscious access to musical knowledge is required. However, as this presentation will show, implicit methods for probing musical knowledge reveal a surprising level of musical competence. Two studies will be reported. The first uses a statistical learning paradigm to determine whether individuals with amusia can internalize transitional probabilities in a novel musical sequence. The second uses an implicit priming method to assess whether these same individuals can form expectations about how a melody will unfold. The results will be presented in the context of recent work which proposes that congenital amusia should be thought of as a disorder of conscious awareness (to musical knowledge), rather than a disorder of musical perception per se.

Observing errors vs. expertise during surgical training

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Observation of a visuomotor task can lead to a more rapid learning of that skill (Mattar & Gribble, 2005). Observing is an important part of surgical training, with medical students routinely observing expert surgeons to learn new procedures. Recent work, however, suggests that errors are crucial for observational learning (Brown et al., 2012). We examined medical students' performance in a surgical training task on a virtual reality simulator. The trainees then watched a video of either a novice individual or an expert surgeon performing the surgical task on the simulator. After watching the video, the medical students then performed the simulator training task immediately after, and one week later. Individuals who watched the error-laden novice performance were significantly better than those who watched the error-free expert surgeon's performance when they returned one week later, across a number of metrics. These findings suggest that observing errors may be crucial for the rapid learning of a wide variety of visuomotor skills, and suggest error-based learning should feature prominently in early training of complex **skills**.

Brown LE, Wilson ET, Obhi SS, Gribble PL (2010) Effect of trial order and error magnitude on motor learning by observing. *J Neurophysiol* 104(3): 1409-16

Mattar AA, Gribble PL (2005) Motor learning by observing. *Neuron* 46(1): 153-60

Finger kinematics during active touch for tactile pleasantness

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Since Lederman and Klatzky's work (1987) on different hand movements to assess different haptic properties, little research had been published about the hand kinematics for the assessment of haptic properties. Furthermore, tactile pleasantness was not included in their study. In the present study, fingertip force and velocity were measured when participants were asked to rate the material temperature, softness, stickiness, roughness and pleasantness. Eight materials were used and there were five experimental blocks for each participant. In each block, the participant was asked to rate one of the material properties on a visual analog score on a computer. The order of the material property to be assessed was balanced across participants. It was found that the participant's finger moved significantly slower when judging cold/warm and softness than when judging roughness ($p < 0.01$). Participants pressed harder when rating softness than when rating roughness or pleasantness ($p = 0.001$). They also pressed harder when rating stickiness than when rating roughness ($p = 0.041$). While rating stickiness, they explored shorter lengths of the material. We also found that increased tactile pleasantness was correlated with decreased roughness, decreased stickiness and increased softness. There was no correlation between fingertip speed and ratings except for stickiness rating.

Lederman SJ, Klatzky RL (1987) Hand movements: a window into haptic object recognition. *Cognitive Psychology*, 19: 342-368.

Explaining Strategic Coordination: Cognitive Hierarchy Theory, Strong Stackelberg Reasoning, and Team Reasoning

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In common interest games, players generally manage to coordinate their actions on mutually optimal outcomes, but orthodox game theory provides no reason for them to play their individual parts in these seemingly obvious solutions and no justification for choosing the corresponding strategies. Several theories have been suggested to explain coordination, among the most prominent being cognitive hierarchy theory, theories of team reasoning, and social projection theory (in symmetric games). These provide plausible explanations but are theoretically problematic. An improved theory of strong Stackelberg reasoning avoids these problems and explains coordination among players who care about their co-players' payoffs and who act as though their co-players could anticipate their choices. Two experiments designed to test cognitive hierarchy, team

reasoning, and strong Stackelberg theories against one another in games without obvious, payoff-dominant solutions suggest that each of the theories provides part of the explanation. Cognitive hierarchy Level-1 reasoning, facilitated by a heuristic of avoiding the worst payoff, tended to predominate, especially in more complicated games, but strong Stackelberg reasoning occurred quite frequently in simpler games and team reasoning in both the simpler and the more complicated games. Many players considered two or more of these modes of reasoning before choosing their strategies.

The effect of mindfulness meditation on time perception

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In recent years, research has increasingly focused on the beneficial effects of meditation on everyday life and performance. Mindfulness in particular, which emphasises maintaining awareness of one's immediate experience, has been shown to improve mind wandering, attention, working memory capacity, and reading comprehension. Here, we investigate the effect of mindfulness meditation on time perception. Using a within-subjects design, participants carried out a temporal bisection task, where several probe durations are compared to the "short" and "long" reference durations that have been learned. Following this, participants either listened to an audiobook (control group) or a meditation recording that focused their attention on the movement of the breath in the body (meditation group). Finally, participants completed the temporal bisection task for a second time. The control group showed no change after the listening task. However, meditation led participants to overestimate durations in comparison with their prior performance. These results are explained within a cognitive-timer framework, whereby focusing one's attention internally slows the rate of functioning of the timer, coupled with larger subjective time units, producing longer perceived durations. This effect of meditation on time perception has wider implications with regard to the mechanisms through which mindfulness practice may alter various cognitive processes.

Attractiveness ideals: Self and other perceptions of cosmetics use

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Conventional accounts suggest women wear cosmetics to impress men as a part of increasing their overall attractiveness. How good are women at optimising their cosmetics to fit men's preferences? An alternative explanation is that women wear cosmetics not to impress men, but to impress women. If so, do women tailor their cosmetics use to the preferences of other women? We photographed 44 models with and without cosmetics, and created a 'cosmetics continuum' for each model that ran from none to full cosmetics. Participants were free to vary the amount of cosmetics each model wore, and were asked to optimise attractiveness of each model from several viewpoints: First, for themselves, second, to what they thought men in general would prefer, and third, to what they thought women in general would prefer. We found that participants preferred significantly less cosmetics than the models actually used. However, participants felt that other people preferred a much higher amount of cosmetics than they did, though this was still less than the amount used by our models. We suggest there is a general consensus that more cosmetics is perceived as more attractive; in fact, real preferences are significantly lower than perceived preferences.

Time and time again: isochronous sequences create temporal expectations

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Isochronous sequences can create expectations about future stimuli. Here we investigate how expectations can affect the perception of anisochronous stimuli. We presented a sequence of unimodal stimuli (either sounds or lights) with a final stimulus either isochronous or anisochronous. When participants judged whether the sequence appeared regular, anisochronies were detected more readily with longer sequences. In another experiment participants judged whether the last stimulus in the sequence appeared before or after a temporal probe in another modality. Perceived timing of anisochronous stimuli shifts towards the expected time based on the previous sequence. Overall, regular sequences affect individual stimuli so that as the number of prior stimuli increases the perceived time of the last stimulus is shifted towards isochrony while any presented anisochrony becomes more detectable. We modeled these seemingly irreconcilable effects using a Bayesian framework: the expectation of when a stimulus is to occur (prior distribution) is combined with sensory evidence (likelihood function) to give rise to perception (posterior distribution). If a stimulus is not presented when expected, its perceived timing is drawn towards isochrony by the effect of the prior probability and the difference between prior and posterior becomes more noticeable as the prior shapes up with longer sequences.

The role of the eyes in processing an intact face and its scrambled image: a dense array ERP and low-resolution electromagnetic tomography (sLORETA) study

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The aim of the present study was to test whether the eyes of an intact face produced a specific brain response compared to the mouth, nose or hair, and whether their specificity was also maintained in a scrambled face. Fifteen subjects were asked to focus visual attention on global and single elements in intact faces and in their scrambled image. EEG data were recorded from 256-Hydrocel Geodesic Sensor-Net200. ERPs analyses showed a difference between the intact-face and the scrambled-face from N170 component until 600 ms on the occipito-temporal montage and at 400-600 ms on the frontal montage. Only the eyes showed a difference between conditions (intact/scrambled-face) at 500 ms. The most activated source detected by sLORETA was the right Middle-Temporal gyrus (BA21) for both conditions and for all elements. Left BA21 resulted in significantly more activation in response to eyes in the intact-face compared to eyes in the scrambled-face at 500 ms. The left BA21 has a central role in high-level visual processing and in understanding others' intentions. These findings suggest a specificity of the eyes and indicate that eyes play the social and communicative role of comprehending the non-verbal intentions of others only when inserted in an intact-face.

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Isochronous sequences can create expectations about future stimuli. Here we investigate how expectations can affect the perception of anisochronous stimuli. We presented a sequence of unimodal stimuli (either sounds or lights) with a final stimulus either isochronous or anisochronous. When participants judged whether the sequence appeared regular, anisochronies were detected more readily with longer sequences. In another experiment participants judged whether the last stimulus in the sequence appeared before or after a temporal probe in another modality. Perceived timing of anisochronous stimuli shifts towards the expected time based on the previous sequence. Overall, regular sequences affect individual stimuli so that as the number of prior stimuli increases the perceived time of the last stimulus is shifted towards isochrony while any presented anisochrony become more detectable. We modeled these seemingly irreconcilable effects using a Bayesian framework: the expectation of when a stimulus is to occur (prior distribution) is combined with sensory evidence (likelihood function) to give rise to perception (posterior distribution). If a stimulus is not presented when expected, its perceived timing is drawn towards isochrony by the effect of the prior probability and the difference between prior and posterior becomes more noticeable as the prior shapes up with longer sequences.

Frontal Theta EEG Activity and the Default Network: A Task-Based Investigation

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The default network (DN) is a functionally connected brain network more active during alert rest than goal-directed behaviour (see Buckner, 2008). It shows anti-correlation to another network presumed to support goal-directed behaviour (the anti-correlated network, AN) with the balance between them suggested to impact task engagement (Sonuga-Barke, 2007). Most DN research uses fMRI, (measuring blood oxygenation, indirectly related to neural activity) inviting criticism that the DN could be an imaging artefact. DN investigation using EEG potentially addresses these criticisms as EEG is a more direct measure of neural activity. Correlation between AN activity and EEG frontal theta (4-8Hz) has been observed at rest (Scheeringa et. al. 2008) however task performance was not investigated here. This extension would provide a behavioural link between EEG and DN literature and provide insight into the DN contribution to attention. Here, EEG was recorded from 20 healthy participants during SART performance and rest. Frontal theta was compared between conditions to patterns predicted by DN research. SART reaction time and trial-by-trial P300 amplitude (indicative of attentional allocation, see Johnson 1988) were taken to indicate task engagement and compared to pre-stimulus frontal theta, to assess whether theta displays the relationship to task performance predicted by DN literature.

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Sonuga-Barke, E. J. S., & Castellanos, F. X. (2007). Spontaneous attentional fluctuations in impaired states and pathological conditions: a neurobiological hypothesis. *Neuroscience & Biobehavioral Reviews*, 31(7), 977–986.

Electrophysiological indices of spatial attention differ in those with high levels of autistic traits

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Individuals with autism and those with high levels of autistic traits (AT) demonstrate atypical selective attention when compared to typically developing individuals / those with lower levels of ATs. We investigated the neural basis of this by

comparing ERP components reflecting allocation of spatial attention (N2pc), target processing (N_T) and distractor suppression (P_D) in individuals with high or low levels of AT. Neurotypical students with either high or low levels of autistic traits as measured via the Autism-Spectrum Quotient (Baron-Cohen et al., 2001) were recruited to participate in one of two experiments. In experiment 1 (n = 33), the N2pc (spatial attention) ERP component was elicited and compared between groups. Experiment 2 (n = 41) elicited the N2pc, the P_D and N_T. Participants with more autistic traits had significantly larger N2pc amplitude than participants with fewer autistic traits in both experiments. In experiment 2 those high in autistic traits also showed attenuated distracter positivity (P_D). These results suggest that the allocation of spatial attention, especially to distractor stimuli, differs in those with more autistic traits compared to those with fewer autistic traits. These data may therefore provide insight into the neural basis of atypical selective attention in individuals with autism.

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Consolidation-dependent semantic influence on word learning in the brain

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Learning a new spoken word requires discrimination between a novel sequence of sounds and similar known words. Word learning can be bolstered by semantic information, but the semantic influence on learning phonological forms specifically remains unclear. Whilst research on rapid word learning in adults further suggests phonological form learning can occur within a single session, extant data also support a role for offline consolidation in novel word learning. We thus investigated whether provision of semantic information facilitated the acquisition of phonological forms, and whether this learning enhancement was modulated by a period of overnight consolidation. Participants learnt novel pseudowords either consistently associated with a visual referent, or with no consistent meaning. An auditory oddball task then tested discrimination of these newly-learned phonological forms from known words. The mismatch negativity (MMN), a measure of auditory discrimination, was not elicited by either type of newly-learned pseudoword at the end of exposure on the first day. When participants returned to the lab after a period of overnight consolidation, the meaning-associated words elicited a MMN; the non-associated words remained unchanged. We suggest that semantic exposure facilitates the development of phonological representations, but that this process requires a period of offline consolidation.

Physiological responses to visual threat are dependent on awareness

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Neurocognitive models suggest that threatening stimuli are prioritised in visual processing and are evaluated by a subcortical pathway independently of conscious awareness (Tamietto & de Gelder, 2010). Such an idea is supported by studies demonstrating that threat-relevant stimuli rendered invisible by backward masking induce physiological responses consistent with fear arousal (Ohman & Soares, 1994). The validity of these findings has been questioned however, by recent research using stringent, objective measures of awareness (Szczepanowski & Pessoa, 2007). Continuous flash suppression (CFS) is a technique considered more optimally suited to dissociating visual input from awareness in which a dynamic masking pattern is presented to one eye to suppress conscious perception of input presented to the other. In the present study, we asked whether threatening images (animal attack) induce physiological arousal, when presented outside of awareness under CFS. In trials where stimuli broke suppression and became visible, threatening stimuli induced a significantly larger skin conductance response than non-threatening stimuli. However, this differential response was eliminated in trials where observers were unaware of stimuli. Our data suggest that the evaluation of visual threat may be strongly modulated by, or dependent on visual awareness.

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Szczepanowski, R., & Pessoa, L. (2007). Fear perception: Can objective and subjective awareness measures be dissociated? *Journal of Vision*, *7*, 1–17.

Tamietto, M., & de Gelder, B. (2010). Neural bases of the non-conscious perception of emotional signals. *Nature Reviews Neuroscience*, *11*, 697–709.

Semantic processing differences in Autism Spectrum Disorder: Evidence from eye movements and reading

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The aim of this experiment was to examine semantic processing in adults with Autism Spectrum Disorder (ASD). Research into reading in ASD has predominantly employed offline techniques that give no insight into the online processing differences that may exist in ASD, and potentially reflect frequently reported comprehension difficulties. We recorded the eye movements of participants with and without ASD as they read sentences that were manipulated to include plausible (control condition), implausible (possible but highly unlikely) or anomalous (impossible) thematic relations. Preliminary findings indicate that the fixation patterns of the control and ASD groups did not differ when reading plausible sentences, but when reading implausible and anomalous sentences the ASD group showed a delayed disruption to reading. The semantic violations resulted in almost immediate disruption in the control group, as seen in first and single fixation durations, whereas the ASD group showed disruption in later stages of processing as indexed by go past and total reading times. The findings suggest that ASD readers may be less efficient at constructing an interpretation of a sentence and evaluating it against their world knowledge and are in line with the Theory of Complex Information Processing in ASD (Minshew & Goldstein, 1998).

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Reducing the barrier of technical jargon with the use of SAFMEDS

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There has been a reduction of students taking STEM subjects in higher education. One reason for this may be due to technical and scientific subjects containing a lot of 'jargon.' The current study looked into the effectiveness of using SAFMEDS flashcards (Say All Fast Minute Every Day Shuffled) to break down technical terminology and remove learning barriers to scientific subjects – in this case a computer science workshop "Techno Camps." 54 students attended a 3-day workshop and were allocated to either the control group or the intervention group. The experimental group completed nine, one minute timings per day of the SAFMEDS pack. The results showed that the intervention group achieved significantly higher post-intervention test scores compared to controls. The 'gains' made by the intervention group were specific to the SAFMEDS concepts verifying the intervention-specific nature of the improvement. Perhaps most importantly, girls in the intervention group showed better gains when compared to both the control group and also to boys in the intervention group. The results of this pilot show that the use of the SAFMEDS procedure helps children learn technical vocabulary rapidly and may help reduce one of the barriers to studying and choosing scientific subjects, particularly in young females.

Effects of Exercise-Induced Arousal on Perceived and Imagined Tempi for Familiar Melodies

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The experience of mentally replaying a familiar tune is a robust experience that preserves many fundamental elements of musical structure. Tunes for which a canonical recorded version exists can be recalled highly accurately with regard to the original pitch and tempo. Even for folk tunes with no standard canonical version (e.g., "Happy Birthday"), individuals exhibit very stable mental representations of both pitch and tempo. The present project looks at the extent to which the internal timekeeping mechanism presumed to underlie preferred tempo judgments can be modulated by physiological arousal, induced through aerobic exercise. Preferred tempo judgments by participants in an exercise condition are compared to a control group who complete a verbal anagram task. Preliminary results suggest that participants' tempo judgments for both perceived and imagined tunes significantly increase following exercise-induced arousal, whereas the control group shows similar tempo judgments before and after the verbal task. Influences of participants' musical training and self-reported auditory imagery ability are also investigated. The results of this study will provide evidence for

how a normally stable internal timekeeping mechanism can be altered by means of physiological arousal, providing an example of how bodily sensations can alter mental representations in a principled way.

Attractiveness ideals: Self and other perceptions of cosmetics use

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Conventional accounts suggest women wear cosmetics to impress men as a part of increasing their overall attractiveness. How good are women at optimising their cosmetics to fit men's preferences? An alternative explanation is that women wear cosmetics not to impress men, but to impress women. If so, do women tailor their cosmetics use to the preferences of other women? We photographed 44 models with and without cosmetics, and created a 'cosmetics continuum' for each model that ran from none to full cosmetics. Participants were free to vary the amount of cosmetics each model wore, and were asked to optimise attractiveness of each model from several viewpoints: First, for themselves, second, to what they thought men in general would prefer, and third, to what they thought women in general would prefer. We found that participants preferred significantly less cosmetics than the models actually used. However, participants felt that other people preferred a much higher amount of cosmetics than they did, though this was still less than the amount used by our models. We suggest there is a general consensus that more cosmetics is perceived as more attractive; in fact, real preferences are significantly lower than perceived preferences.

Masking, but not priming of amplitude statistics in natural image categorisation

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The Fourier phase structure of an image is important for natural/manmade scene categorisation, yet the role of Fourier amplitude information is unresolved (Gaspar & Rousselet, 2009; Loschky & Larson, 2008). We used a priming paradigm to explore the role of amplitude information in rapid scene categorisation. Prime stimuli contained the average amplitude spectrum of a large set of natural or manmade images, with randomised phase. Observers viewed a prime stimulus prior to categorising a brief (26ms) test image that contained a blend of natural and manmade phase, paired with either natural, manmade or averaged amplitude spectra. Observers' natural/manmade category boundary was modulated by the category of the prime in a manner best described as perceptual masking (Experiment 1). When object recognition was disrupted via spatial and luminance inversion of the test images, responses were biased toward natural classifications and masking was eliminated following manmade, but not natural, primes (Experiment 2). This suggests that masking following a manmade amplitude prime (Experiment 1) is due to degraded object recognition. Experiment 3 suggested that natural prime effects occur primarily via masking diagnostic naturalistic contours. We found no evidence for a direct role of global amplitude spectra in rapid scene

categorisation.

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Learning of face evaluations from identity-contingent predictive gaze-cues: The role of emotion and individual differences as evidenced by facial electromyography

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Gaze direction is a powerful cue to the object of another individuals attention and cues rapid and automatic attention shifts to the same location in observers. This is demonstrated in gaze-cueing studies which show reaction times to targets are slower when a face gazes away from the target (incongruent) compared to when it gazes towards (congruent). It has also been shown that the use of gaze by particular faces to consistently facilitate or delay detection of targets can increase and decrease judgements of trustworthiness, respectively. However, it is unclear how gaze-cues translate into changes in trust judgements. This experiment tested the hypothesis that emotional reactions to the gaze-cues underlies the learning of trust by measuring facial electromyography (EMG) from the zygomaticus and corrugator muscles during identity-contingent gaze-cueing. Incongruent faces were not only responded to slower during gaze-cueing and judged less trustworthy afterwards, but also elicited larger EMG activity during the presentation of the gaze-cue. Furthermore, the gaze-cueing effect on EMG reactions was stronger in those who showed larger negative changes in trust judgements to incongruent compared to congruent faces. These findings highlight the importance of emotion and a role for individual differences in learning to (mis)trust faces from identity-contingent gaze-cues.

Self in the first and third person: Self-tagging and perspective taking

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Existing perspective-taking research has primarily studied the self as a first-person phenomenon, often contrasting it with an avatar representing a stranger. However, the self may also be studied as a third-person phenomenon by adding a self-associated avatar to the viewing environment. Two experiments were conducted to examine the effect of the first- and third-person self in a visual perspective-taking

paradigm adapted from Samson et al. (2010). In Experiment 1, participants responded on the basis of their own (first-person) perspective or from the perspective of an avatar (e.g., Self or Other). In Experiment 2, the first-person perspective was held constant and both avatars were presented within the same scene. Participants responded on the basis of an avatar's perspective, with target perspective varied across trials. Reliable self advantages were found in both experiments. Significant interference was observed from the first-person and Self avatar perspectives, but not from the Other avatar perspective (Experiment 1). At the third-person level, participants were significantly more efficient at perspective-taking for the Self avatar relative to the Other avatar (Experiment 2), suggesting that the Self avatar is attended more efficiently overall than the Other avatar, even though each avatar interferes with the other's perspective.

Samson, D., Apperly, I. A., Braithwaite, J. J., Andrews, B. J., & Bodley Scott, S. E. (2010). Seeing it their way: evidence for rapid and involuntary computation of what other people see. *Journal of experimental psychology. Human perception and performance*, 36(5), 1255–66. doi:10.1037/a0018729.

Orthographic effects on speech perception reflect online activation, not phonological restructuring

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Substantial evidence now indicates that the recognition and production of spoken words in literate individuals is influenced by the way that they are spelled. We present three experiments designed to uncover the mechanism that underlies this orthographic effect. Participants in each experiment were asked to make lexical decisions to a series of spoken words. The critical stimuli were nonwords comprising a regularised pronunciation of a spelling-to-sound atypical English spelling (e.g. /pInt/, which is the regularised pronunciation of PINT). Results of the three experiments revealed that participants were slower to reject /pInt/ items compared with matched controls, but only when given sufficient time to make their responses. These results seem inconsistent with a phonological restructuring account of orthographic effects on speech production (e.g. Muneaux & Ziegler, 2004) and instead favour an online activation account in which orthographic information is activated whenever we hear a spoken word and feeds back to influence responding in the speech processing task (e.g. Rastle, McCormick, Bayliss, & Davis, 2011).

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Cross-cultural differences in perceptual style and their relationship to self-construal

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There is a general assumption that individuals from East-Asian and Western cultures show differences in perceptual style. This thesis is based on the position that Westerners possess independent self-constructs emphasising uniqueness, separateness and self-reliance, whereas East-Asians have interdependent self-constructs emphasising social relationships and community ties. It is thought that such differences in self-perception lead to differences in more general perceptual style, however, evidence in support of this position is mixed. Here, for the first time, we investigated the degree to which independent and interdependent self-construal are related to perceptual style. Participants, recruited either from the UK (N = 32) or Malaysia (N = 28), completed the Embedded Figures Task (EFT), the Framed-Line task (FLT) the Navon hierarchical figures task and the Social-Construal Scale. Contrary to assumptions, the two groups did not vary in terms of self-construal, although group differences in some of the perceptual tasks were observed. The data suggest a complex relationship between culture, self-construal and perceptual style and highlight the effect of task-choice when measuring perceptual style. Furthermore, and importantly for existing research in this area, it is clear that strength of independent or interdependent self-construct cannot be assumed from country of origin.

Implicit preference for smiles: when does asymmetry matter?

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Symmetry is processed efficiently and it is linked to beauty. Recent studies showed that symmetrical patterns are implicitly preferred to random patterns (Makin, Pecchinenda, & Bertamini, 2012), but to what extent symmetry is crucial for face attractiveness and preference? The current study tested whether smiles with natural (non reflectional) symmetry are implicitly preferred over asymmetric smiles. We used the Affective Misattribution Procedure (Payne, Cheng, Govorun, & Stewart, 2005) in which faces with symmetric or asymmetric (either left or right side) smiles primed unfamiliar neutral targets, consisting of Chinese pictograms (Experiment 1). Surprisingly, pictograms following asymmetric smiles were evaluated as more pleasant compared to those following symmetric smiles and this effect was due to the right-sided asymmetry. In contrast, when the primes were neutral faces participants preferred pictograms following symmetric mouths (Experiment 2). These results suggest that at a very brief exposure right-sided asymmetric smiles which appear more pronounced on the observer's left visual field were possibly perceived (by the observer's right hemisphere) as more intense. This affective response was automatically attributed to the pictograms. However, when the face lacked emotional information, symmetry assumed more saliency. Findings

are discussed in relation to models of hemispheric lateralization in emotion processing and to the role of symmetry in hedonic evaluation of faces.

Makin, A. D. J., Pecchinenda, A., & Bertamini, M. (2012). Implicit Affective Evaluation of Visual Symmetry. *Emotion, 12*, 1021-1030.

Payne, B. K., Cheng, C. M., Govorun, O., & Stewart, B. D. (2005). An Inkblot for Attitudes: Affect Misattribution as Implicit Measurement. *Journal of Personality and Social Psychology, 89*, 277-293.

Social Executive Function

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Executive functions are a set of mental processes that manage and control basic cognitive functions necessary for carrying out goal related actions. Social cognition is the process referring to cognition and thought processes involving other people. We can examine the interaction between social cognition and executive function, and to what degree they can be dissociated. The current project compared an executive function Go/No Go task using social and non-social stimuli using EEG. The social stimuli were images of two actors that took turns in saying "go" and the non-social were images of flowers that changed colour to the same audio cue. The participants responded to the social or non-social go stimuli in separate blocks. The aim was to examine whether inhibition of response tasks that involve social stimuli use higher cognitive functions that are not used in non-social tasks. It is hypothesised that reaction times and error rates, and the ERP's N200 (conflict management) and N170 (processing faces) will differ between social and non-social conditions. Results will be discussed in relation to the neural and behavioural differences between social and non-social conditions.

Embodied memory: Reactivating facial mimicry of emotion when viewing neutral faces

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When observing the actions of other people similar body states are activated in the observer. For example, when observing someone smile, the zygomaticus cheek muscles associated with smiling are activated in the observer; and when observing a frown, the corrugator brow muscles are activated. We show that these facial muscle responses can be observed when the face is passively viewed some minutes later in a different task, even though the face is not expressing any emotion. The results support embodiment accounts of memory, where prior body states during initial encoding are reactivated when re-encountering a stimulus as long as the processing context is reinstated.

Spatial Transformations of bodies and objects in Adults with Autism Spectrum Disorder

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Previous research into Autism Spectrum Disorder (ASD) has shown people with autism to have difficulty with taking another person's perspective; however it is unclear how much of this difficulty is based upon problems performing basic spatial transformations. Here we examine two types of spatial transformation (egocentric transformations and mental rotation) in adults with and without ASD. Using a 2x2x2 design we examined the effects of group (ASD vs. typical), task (egocentric vs. mental rotation) and stimulus (body vs. car) on task performance. Results showed that participants with ASD were impaired on both tasks compared to typically developing participants across stimulus types. Results suggest that people with Autism may have general impairments in both spatial and perceptual decision making abilities which could impact on their ability to perform spatial transformations effectively.

Emotion cross-talk: Adaptation to facial expressions affects vocal emotion perception

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Social interaction depends in part on accurate perception of emotional signals. These signals are typically conveyed multi-modally by the face, voice and body. Previous research has demonstrated unimodal contrastive aftereffects for emotionally expressive faces *or* voices. Here we were interested in whether these aftereffects transfer across modality. We show for the first time that adaptation to facial expressions elicits significant auditory aftereffects. Adaptation to angry facial expressions caused ambiguous vocal stimuli drawn from an anger-fear morphed continuum to be perceived as less angry and more fearful, while adaptation to fearful faces elicited opposite aftereffects. Although our crossmodal aftereffects were generally weaker than previous unimodal effects, our findings suggest a high-level, supramodal representation of emotion. Further research will explore the degree to which the current findings are dependent on the same identity during adaptation and test.

Exogenous Cues affect Aesthetic Evaluation

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More work is necessary on the influence of attention on preference formation. Exogenous cues, in particular, are interesting since they are known to affect behavioral and oculomotor responses more directly than endogenous cues. We have used a modified versions of Posner's paradigm in which attention was directed to the left or right by a flashing light. In a first experiment unfamiliar abstract patterns with varied degree of regularity were presented either in the same position as the cue or in a different position.

Immediately afterwards participants evaluated aesthetically the targets using a rating scale. The results showed that the more regular stimuli were preferred, as expected. Moreover, targets presented at the cued position were rated as more beautiful than targets at the uncued location. In a second experiment a simple circle was presented at the cued or uncued position and participants reported its location. Afterwards, abstract patterns were presented at fixation and were rated aesthetically. We observed that when patterns followed a cued trial they were rated as more beautiful. These preliminary results suggest that the reward linked to finding targets in the cued location might be responsible for the modulation of preference.

Speed-accuracy regulation and error-monitoring as a function of increasing depressive symptoms

Blair Saunders* and Ines Jentzsch
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Depression has been associated with hypersensitivity towards perceived failure and mistakes. Consequently, depressed individuals often respond less accurately after errors compared to non-depressed participants. While studies of error-related behavioural adjustments in depression have focused on posterror effects, the current study investigated potential depressive-symptom related differences in reaction time (RT) speeding which typically precedes mistakes. We hypothesised that if individuals with increased depressive symptoms found errors particularly aversive, they might adopt a more cautious response style, demonstrating reduced pre-error speeding. Participants were split into two groups (low and elevated depressive symptoms) and completed a choice RT task at four response-stimulus-intervals (a parameter known to influence serial RT performance). Simultaneous electroencephalographic activity was recorded to measure error-specific event-related potentials during task performance. While we found typical pre- and post-error behavioural adjustments at each response-stimulus-interval, these behavioural effects did not differ as a function of symptom group. However, an event-related potential associated with error-monitoring (the ERN) was reduced as a function of increasing depressive symptoms, suggesting that increased symptom severity is associated with reduced error sensitivity. While these results do not confirm our initial hypotheses, our findings support recent suggestions that ERN amplitude does not necessarily predict the extent of error-related behavioural adjustments.

The efficacy of Positive Psychology interventions in primary school children

Amanda Louise Shanks*, Leona McGarrigle*, Brendan Hore*, Rachel Oakes*, Grace Carey*, Aisling Campion*, Katie Vickers*, Carl Hughes* and John Parkinson*
Bangor University
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Positive Psychology interventions have been shown to increase well-being and alleviate depression in the adult population (Seligman et al, 2005). In general, Positive Psychology aims to promote human flourishing, and its practice has been argued to act as a psychological buffer against mental illness and distress. There is huge potential to

enhance resilience in children and so future proof them against life's challenges. The current research focused on assessing the efficacy of the '3 Good Things' intervention with primary school children. Two studies employed the intervention in Schools across Gwynedd and Anglesey in Wales. The first study demonstrated, in a large cohort, that keeping a positive diary did increase various measures of subjective well-being. The second study, employing a smaller sample, incorporated more robust controls and again resulted in increased subjective well-being in the experimental group. In both cases, whilst the intervention lasted only a week, the positive effects were still present at 3 month follow up. Overall the research supports the notion that positive psychology interventions can produce a lasting impact on the subjective well-being of children which may contribute to future resilience.

Memory consolidation protects against interference in generalisation of language learning

Jakke Tamminen¹, Matthew Davis² and Kathleen Rastle¹

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Associative learning (A-B) is vulnerable to interference from subsequent conflicting learning (A-C) unless the initial memory is allowed to consolidate first, preferably during sleep (Ellenbogen et al., 2006). We tested whether generalisation of newly learned language is similarly affected. In an artificial language learning approach participants learned new affixes (e.g., -tege) embedded in new words (e.g., "sleep-tege is a participant in a study about sleep"). Semantically consistent affixes referred to one semantic category (e.g., people) while semantically inconsistent affixes referred to two different categories (e.g., people and places). In Experiment 1 both affix types were trained in one training session. We combined the trained affixes with untrained stems (e.g., "sail-tege") one week later in a semantic priming task to examine learning and generalisation of the affixes to new stem contexts. Priming was afforded only by the semantically consistent affixes. In Experiment 2 inconsistent affixes were trained with one semantic category on day 1 and with a different category on day 2. Priming was now seen in both consistent and inconsistent affixes. In the inconsistent condition offline memory consolidation appears to be necessary for the addition and generalisation of a second meaning without interfering with the first affix-meaning mapping.

Ellenbogen, J. M., Hulbert, J. C., Stickgold, R., Dinges, D. F., & Thompson-Schill, S. L. (2006). Interfering with theories of sleep and memory: Sleep, declarative memory, and associative interference. *Current Biology*, *16*, 1290-1294.

Eye Movements demonstrate top-down control in singleton search

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The allocation of attention and eye movements was examined under singleton search conditions. In experiment 1 we assessed whether an irrelevant colour salient

singleton would distract from search for a feature target. The singleton distractor effect disrupted trials but only on target absent data. *In addition first fixations were reduced to singletons compared to targets and the time to fixate was reduced for targets compared with singletons even when the other items were all homogeneous distractors.* In experiment 2 the target was sometimes a singleton. In this case RTs were faster when the target was a colour singleton but there was again no effect of the singleton distractor when the target was present. On eye movements there was again evidence for targets engaging attention faster than singleton distractors, and there was no additional gain from the target being a singleton. The data provide evidence for top-down control of the initial allocation of attention to search displays, even under conditions where singleton distractors are present.

Individuals with autism spectrum disorders benefit from the addition of coloured tints when discriminating intensities of facial expressions

Lydia Whitaker*, Catherine R.G. Jones, Arnold Wilkins and Debi Roberson
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Impairments in the processing of facial expressions often occur in individuals with autism spectrum disorder (ASD), possibly related to atypical perceptual processing and/or visual stress. An established means of reducing visual stress and improving reading speed in typically developing (TD) individuals is the use of transparent coloured tints (e.g. Wilkins, Jeanes, Pumfrey, & Laskier, 1996). Ludlow, Taylor-Whiffen and Wilkins (2012) recently found that coloured overlays improved recognition of complex emotions from the eye area in individuals with ASD. In the present study we measured judgements of emotional intensity using self-selected transparent coloured tints in 16 children with ASD (mean age=11;6) and 16 age and full-scale IQ matched TD controls (mean age=11;2). Participants judged which of two simultaneously presented faces expressed the most intense emotion for face pairs displaying anger, sadness, disgust, fear, happiness or surprise. The face pairs were presented with or without coloured tints, chosen individually as best improving the perceived clarity of text. ASD children's judgements of emotional intensity improved significantly in accuracy with the addition of coloured tints, but TD children's did not; a result that would be consistent with a link between impairments in facial expression processing and visual stress in individuals with ASD.

Self-deception and illusions of control

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Aims/Objectives: Recent theories of self-deception propose a dissociation allowing simultaneously held, contradictory beliefs (Trivers & von Hippel, 2011). We investigated whether explicit reports of control, demonstrated by an illusion of control (IOC, Alloy & Abramson, 1979), were dissociated from other accurate knowledge of environmental probabilities. *Methods:* 52 participants completed a 100-trial task, in

which two responses (space bar press/no-press) and two outcomes (reward=green light; no reward=no light) were noncontingently related, i.e., no control. Participants estimated their control, and the conditional probabilities of reward. On a subsequent 10-trial task, they attempted to maximise reward based on their knowledge. *Results*: Participants demonstrated a significant IOC, whilst accurately estimating the conditional probabilities. Although reward was randomly determined, about half of participants, by chance received more reward for responding than not responding. For these participants, subsequent performance was based on the inaccurate IOC, rather than the accurate knowledge of contingent reward. *Conclusion*: Participants demonstrated two forms of knowledge: an inaccurate report of inflated actual control; and accurate knowledge of the conditional probabilities. Yet it was the inaccurate report that guided subsequent behaviour in participants who were rewarded for responding. Our results demonstrate a form of self-deception even when accurate contradictory evidence is available.

Alloy, L.B., & Abramson, L.Y. (1979). Judgement of contingency in depressed and nondepressed students: Sadder but wiser? *Journal of Experimental Psychology*, *108*, 441–485. doi: 10.1037//0096-3445.108.4.441

Trivers, R., & von Hippel, W. (2011). The evolution and psychology of self-deception. *Behavioural and Brain Sciences*, *34*, 1–56. doi: 10.1017/S0140525X10001354

When sixth sense is shortsighted: Detrimental effects of exercise-induced arousal on emotional decision-making on the Iowa Gambling Task

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Within the Somatic Marker Hypothesis (SMH), visceral changes associated with contemplation of options promote advantageous, efficient, intuitive decision-making. However, research has demonstrated that high levels of emotional arousal can be deleterious, leading to later-regretted decisions focussed on short-term gratification (e.g., Loewenstein, 1996), a phenomenon the SMH does not fully address. Testing SMH predictions that unrelated arousal is only detrimental when strongly incongruent with the current decision (Bechara, 2011), participants performed the Iowa Gambling Task (IGT) - involving rewards, punishments and uncertain contingencies, mimicking real-world emotional decision-making ($N = 46$). In an independent design, incidental arousal level was manipulated via a 60s burst of hand dynamometer exercise-induced arousal (Control condition 0%; Medium Arousal condition 50%; High Arousal condition 75% of individually-calibrated maximum), both prior to and mid-IGT performance. Medium and High Arousal groups had significantly impaired performance compared to Controls; significant main effect of Arousal, $F(2, 43) = 5.063$, $p = .011$. Thus, contrary to SMH predictions, even subtle shifts in neutral incidental arousal may be disadvantageous. Differentiating the role of visceral signals has significant implications for the highly influential SMH and everyday affective decision-making. This finding also aids understanding of the consistent, significant variability seen in healthy IGT controls.

Bechara, A. (2011). Human emotions in decision making: Are they useful or disruptive? In O. Vartanian & D. R. Mandel (Eds.), *Neuroscience of Decision Making* (pp. 73-95). Hove: Psychology Press.

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, 65(3), 272-292.

Read this and I'll pay you a fiver: Eye tracking implicit meaning in conditionals

Jeffrey Wood*, Andrew Stewart and Louise Connell
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Conditionals can be used to convey a variety of meanings such as inducements (promises and threats) and advice (tips and warnings). Previous research demonstrated a delayed reading time penalty when an explicitly revealed speech act does not match an anaphorically referenced implicit conditional speech act for within speech acts using inducements (i.e., promises vs threats) (Experiment 2, Haigh, Stewart, Wood & Connell, 2011). For example, following the conditional “if you read this, then I’ll pay you a fiver” a mismatching trial would reference a threat, ‘This threat helped John decide whether to read the piece’, in the following sentence. In the eyetracking study reported here, we explored whether this more sensitive measure would still show a delayed reading time penalty. The experiment revealed a processing penalty on the named speech act word for total reading time when implicit promises were anaphorically referenced as threats. As this measure is more sensitive than that which has been used previously, this suggests that readers do experience a processing cost during processing of the mis-matching anaphor. Measures of early processing also hint at this effect starting to emerge relatively quickly.

Haigh, M., Stewart, A.J., Wood, J. S. & Connell, L (2011) Conditional advice and inducements: are readers sensitive to implicit speech acts during comprehension? *Acta Psychologica*, 136, 419–424.

Neural correlates of the interaction between processing of identity and emotion in faces: evidence using redundancy gains

Alla Yankouskaya*¹, Pia Rotshtein*² and Glyn Humphreys³
1. University of Oxford
2. University of Birmingham
3. University of Oxford
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The goal of this study was to use neuroimaging data to gain insight into what neural network supports interaction between processing of identity and emotional expression in faces. The benefits of redundant identity and emotion signals were evaluated and formally tested in relation to models of independent and co-active feature processing (1). The behavioural data demonstrated that the redundancy effect is determined by co-active processing of target identity and target emotional expression in faces. Multivariate Pattern Analysis demonstrated that compared to both single targets the redundant targets face elicits stronger functional connectivity between the Orbitofrontal cortex and the medial/inferior regions in the occipital lobe. Neuroimaging results suggest that possible mechanism of the enhanced performance for the face containing both the target identity and target expression is mediated by reciprocal interaction between the OFC and Occ.

The OFC showed also increase coupling with the superior parietal when compared to the identity target alone, while the left IPS showed increase coupling with the middle cingulate cortex during the emotional target compared to the redundant target. The results suggest that larger recruitment of sensory simulation network is recruited to support the emotional target detection when compared to the redundant target conditions.

NOTES

NOTES

Local Information

Accommodation

University Accommodation

A choice of accommodation has been reserved from 2nd – 6th July inclusive. A limited number of rooms have been reserved so please book as early as possible by using the enclosed booking form. This should be returned with payment no later than the 20th June 2013.

Ffriddoedd Site: Rooms cost £35.00 per night for a single en-suite room with breakfast. The conference venue is a 10 minute walk. Please indicate which nights you wish to book

The Management Centre: Bangor Business School, College Road Bangor. Rooms cost £60.00 per night for en-suite double room with breakfast. The conference venue is a 3 minute walk.

Other Accommodation

Eryl Mor Hotel: 2 Upper Garth Road, Bangor. LL57 2SR. Tel: 01248 353789. From £55.00 per night. The conference venue is a 10 minute walk. www.erylmorhotel.co.uk

Carreg Bran Hotel: Church Lane, Llanfairpwll. LL61 5HY. Tel: 01248 719134. From £65.00 per night. The conference is a 10 minute drive. www.carregbranhotel.co.uk

The Victoria Hotel: Telford Road, Menai Bridge, Anglesey. LL59 5DR. Tel: 01248 712309. From £49.50 per night. The conference is a 25 minute walk/5 minute drive. www.vicmenai.com

Ye Olde Bulls Head Inn & Townhouse: Castle Street, Beaumaris, Anglesey. LL58 8AP. From £100.00 per night. The conference is a 15 minute drive. www.bullsheadinn.co.uk

The Bulkeley Hotel: 19 Castle Street, Beaumaris, Anglesey, LL58 8AW. Tel: 01248 810415. From £70.00 per night. The conference is a 15 minute drive. www.bulkeleyhotel.co.uk/

Conference Dinner

The conference dinner will be served at 7:30pm on Thursday, 4th July in Pritchard-Jones Hall, Main Arts Building, Bangor University, College Road, LL57 2DG. A booking form is enclosed. The cost will be £35 per head for 3 courses and wine. EPS members please reserve a place and indicate any dietary requirements on the booking form which should be returned to:

EPS Meeting Organisation, School of Psychology, Brigantia Building, Bangor University, LL57 2AS before 20th June 2013.

The dinner will be followed by a School of Psychology 50th anniversary Ceilidh dance, which is free to EPS members. A bar service will be available.

Local Information

Travel

By road: If you have a Satellite Navigation system in your car then using LL57 2DG will get you to Bangor, near to the Main Arts Building (building 51 on the map of Bangor).

Visitor Parking: Car parking is available on the University campus. However, a parking permit **MUST** be displayed to avoid fines. Please contact Angela Nicholls on a.nicholls@bangor.ac.uk to request a permit.

By Bus: TrawsCambria serves Bangor daily and links with services to South and West Wales, Wrexham and Barmouth. Go to www.trawscambria.info for details.

By rail: See the National Rail website <http://www.nationalrail.co.uk/> for frequent train services to Bangor station.

By sea: If you're coming to Bangor from Ireland you'll be able to cross on the ferry to Holyhead, please see these external websites for timetables:

<http://www.irishferries.com>

<http://www.stenaline.com>

If you are arriving at Holyhead, there is a rail link to Bangor (journey time about 30 minutes). Check National Rail website <http://www.nationalrail.co.uk/> for details.

By air: If you are arriving at Manchester or Liverpool Airport, there is a rail link to Bangor running frequently. Please check the National Rail website <http://www.nationalrail.co.uk/> for further details.

- Flights to Manchester: <http://www.manairport.co.uk>
- Flights to Liverpool : <http://www.liverpooljohnlennonairport.com>

Taxi: Two reliable firms are:
Chubbs Cabs: 01248 353535
Gwyns / Ace Taxis: 01248 355355

Eating and Drinking on Campus

Cafe Teras - Counter Service - 8.30am - 5.00pm: Located adjacent to the Terrace in the ground floor of Main Arts Building, Cafe Teras is the ideal venue for a coffee break between lectures, a hot lunch from our range of freshly cooked, wholesome daily dishes or a convenient place to call for that 'grab & go' moment.

Cafe Teras Coffee Pod: Located in the Main Arts foyer, serving teas, coffees, cold drinks, homemade sandwiches and healthy snacks

TERAS Lounge – relaxed seating, unique eating: Opening hours: 8.00 a.m. – 6.00 p.m. Monday – Wednesday, 8.00 a.m. – 10.00 p.m. Thursday and Friday, located next door to Café Teras.

The Management Centre: Bangor Business School, College Road, Bangor, Gwynedd.
Tel: 01248 356900.

Local Information

Evening Meal

Restaurants, both on Campus and in Bangor

TERAS Lounge – relaxed seating, unique eating: Opening hours: 8.00 a.m. – 6.00 p.m. Monday – Wednesday, 8.00 a.m. – 10.00 p.m. Thursday and Friday. Located next door to Café Teras.

The Management Centre, Bangor Business School, College Road, Bangor, Gwynedd. Tel: 01248 356900.

Greek Taverna Restaurant, 12 – 14 Holyhead Road, Bangor, Gwynedd. LL57 2EG. Tel: 01248 354991.

Oscars Lounge Bar and Restaurant, 318 High Street, Bangor. Tel: 01248 355949.

The Fat Cat Café Bar, 161 High Street, Bangor, Gwynedd. LL57 1NU. Tel: 01248 370445.

Ristorante Pulcinella, Garth Road, Bangor, Gwynedd. LL57 2SW. Tel: 01248 362807.

Blue Sky Café, Ambassador Hall, Rear of 236 High Street, Bangor, LL57 1PA. Tel: 01248 355444

1845 Café-Deli Bar, Waterloo Street, Bangor, LL57 1DS. Tel: 01248 355969

Pubs

Upper Bangor (near University)

Belle Vue Hotel, Holyhead Road, Bangor, Gwynedd. LL57 2EU. Tel: 01248 364439.

Greek Taverna Restaurant, 12 – 14 Holyhead Road, Bangor, Gwynedd. LL57 2EG. Tel: 01248 354991.

Bar Uno, located close to the Halls of Residence, Victoria Drive, Bangor, Gwynedd. LL57 2EN. Tel: 01248 388888.

Tap and Spile, Garth Road, Bangor. LL57 2SW. Tel: 01248 370835.

The Boatyard Inn, Garth Road, Bangor, Gwynedd. LL57 2SF. Tel: 01248 362462.

Bangor Town Centre

The Fat Cat Café Bar, 161 High Street, Bangor, Gwynedd. LL57 1NU. Tel: 01248 370445.

The Black Bull Inn (Wetherspoons), 107 High Street, Bangor, Gwynedd. LL57 1NS. Tel: 01248 387900.

Local Information

The Skerries, 374 High Street, Bangor, Gwynedd. LL57 1YE.
Tel: 01248 352277.

Places of Interest

Penrhyn Castle, Bangor. A 19th Century fantasy castle with spectacular surroundings.

Portmeirion Village, Portmeirion, Gwynedd. The village became famous as the set for the television series *The Prisoner*, starring Patrick McGoochan, who was Number 6.

Beaumaris Castle / Court / Goal. Beaumaris Castle is a World Heritage Site, attracting 90,000 visitors per year. It is located on the edge of Beaumaris Town.

Penmon Priory. Penmon has a range of different and interesting buildings. The oldest is probably St Seiriol's Well, thought to have healing powers and visited by pilgrims.

Plas Newydd, Anglesey. This elegant house was redesigned by James Wyatt in the 18th Century. The house is famous for its Rex Whistler association, containing his largest painting exhibition. A military museum contains relics of the 1st Marquis of Anglesey, who commanded the cavalry at the Battle of Waterloo. The garden is one for all seasons. In Summer the terrace garden is an explosion of colour.

South Stack Lighthouse, Holyhead, Anglesey. Set in a spectacular location to the north-west of Holyhead. The lighthouse acts as a waymark for coastal traffic and a landmark and orientation light for vessels crossing the Irish Sea to and from the ports of Holyhead and Dun Laoghaire. South Stack offers a wealth of birdlife from the RSPB's Eillin Tower. (NB. To access the lighthouse there are 400 steps each way).

BOOKING FORM FOR CONFERENCE DINNER



BANGOR MEETING 3 – 5th JULY 2013

The Dinner is on Thursday 4th July at 7:30pm, in Pritchard-Jones Hall, Main Arts Building, Bangor University.

The cost will be £35.00 per person, including 3 courses, wine, water and after dinner coffee.

Postgraduates may attend the dinner for a subsidised cost of £17.50. In this instance the booking form must be accompanied by a statement from an EPS member confirming Postgraduate status.

The School of Psychology, Bangor University is celebrating its 50th Anniversary. To mark the occasion we are hosting a celebration Ceilidh after the conference dinner. This is free of charge to EPS conference delegates. Please indicate below if you would like to attend.

Name:
 Address:
 Tel and email:

Conference Dinner – Thursday 4 th July 2013 at 7.30pm	Please Tick
Starter (please choose one option)	
Llandudno smoked salmon platter, horseradish crème brulé, lemon oil and baby mizuna leaves, lemon croutons	
Welsh pork terrine studded with black pudding and pistachio, red onion marmalade and a black pepper croute	
Cream of tomato soup, chives crème fraiche and a drizzle of olive oil (V)	
Savoury Welsh goat cheese panna cotta served with grilled piquillo peppers and toasted ciabatta croutes (V)	
Main Course (please choose one option)	
Pan fried breast of corn fed chicken, minted crushed new potatoes, medley of beans and a tarragon sauce	
Cannon of salt marsh Welsh Lamb, dauphinoise potatoes, Conwy honey roast carrots and long stem broccoli, redcurrant and rosemary jus	
Welsh honey and ginger marinated duck breast, fondant potatoes, roasted carrots and creamed cabbage, reduced soy jus	
Wild mushroom and asparagus tart, creamed spinach and roasted carrots, smoked butter sauce (V)	
Sweet (please choose one option)	
Layered Eaton mess with strawberries swirled with chocolate sauce flavoured with Penderyn whisky, served with lemon shortbread	
Blueberry and thyme cheesecake, blood orange curd sauce, berry skewer and Chantilly cream	
White chocolate and basil bavarois, raspberry sauce and chocolate lollipop	
50 th Anniversary Ceilidh – Thursday 4 th July 2013 at 9.00 – 11.30pm, Pritchard-Jones Hall (Free of charge for EPS members)	Please Tick
A local and very popular Ceilidh band ‘Aderyn Prin’ will be entertaining us with live music and dancing. A bar service will be available.	

Special dietary requirements:

.....

Please return this form, with your cheque (made payable to Bangor University) to: Louise Ainsworth, EPS Organisation, School of Psychology, Brigantia Building, Bangor University, LL57 2AS.

BOOKING FORMS MUST BE RETURNED, TOGETHER WITH FULL PAYMENT BY THURSDAY 20th JUNE 2013.

BOOKING FORM FOR CONFERENCE ACCOMMODATION

BANGOR MEETING 3 – 5th JULY, 2013



A choice of accommodation has been reserved for the nights of 2nd – 6th July 2013.

Rooms at the Ffriddoedd Site Halls of Residence cost £35 per night for a single en suite room including breakfast. The conference venue is a 10-minute walk.

Rooms at The Management Centre cost from £60.00 per night for en-suite double room with breakfast. The conference venue is a 3-minute walk.

Additional nights' accommodation may be available on request – please email a.nicholls@bangor.ac.uk

Name:

Address:.....

.....

Tel:

Email:

Please indicate with a tick the accommodation you require and which nights you wish to book.

Nights	Ffriddoedd Site Halls of Residence (single room)	The Management Centre (double room)
2 nd July	£35 <input type="checkbox"/>	£60 <input type="checkbox"/>
3 rd July	£35 <input type="checkbox"/>	£60 <input type="checkbox"/>
4 th July	£35 <input type="checkbox"/>	£60 <input type="checkbox"/>
5 th July	£35 <input type="checkbox"/>	£60 <input type="checkbox"/>
6 th July	£35 <input type="checkbox"/>	£60 <input type="checkbox"/>
Total payment		

Please return this form, with your cheque (made payable to Bangor University) to:
EPS Meeting Organisation, School of Psychology, Brigantia Building, Bangor University, LL57 2AS.

Accommodation may be limited, so please book as early as possible.
BOOKING FORMS MUST BE RECEIVED, TOGETHER WITH FULL PAYMENT BY
Thursday 20th June 2013.

All accepted bookings will be confirmed by email and check-in information and directions will be sent in advance.

The Twentieth EPS Prize Lecture

EPS
Experimental
Psychology
Society



will be delivered by

Dr Antonia Hamilton
University of Nottingham

Towards a neurocognitive
framework for social interaction



6.00pm
Thursday 4th July 2013

Lecture Theatre 4, Bangor University,
College Road, Bangor, LL57 2DG

The lecture will be open to the public

EPSExperimental
Psychology
Society

Membership Proposal Form

*Please use BLACK ink***Name:****Title:****Age:**

Full current professional address

	Email
	Telephone

Degrees:

Date	Degree	Class	University

Experience:

Dates	Post

Current research interests

--

Oral Papers delivered to EPS, with dates (*In the case of jointly authored papers, please indicate who spoke*)

--

Publications (up to two examples of senior-authored and peer-reviewed: published articles, not "in press")

--

Signature of applicant

Date

--	--

In supporting this candidate, we are agreeing that the applicant has made independent contributions to the publications cited above and merits membership of the Society

Proposer
SignatureSeconder
Signature

Print Name

Print Name



NOMINATIONS

Nominations for new members should be made using the form on the preceding page.

Entries should be made in clear black type, using one side of the form only. 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; up to 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 1 September to the EPS Assistant: Michelle Dorman, School of Psychology, University of Nottingham, University Park, Nottingham, NG7 2RD.

CRITERIA AND PROCEDURES

Soon after the closing date of 1 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, usually in October. 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 an independent account of their work in a reputable, peer-reviewed psychological journal, and
- c) personally delivered an oral paper to the Society.

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.



Bangor Meeting, 3-5 July 2013

The programme for the Bangor meeting is enclosed with this mailing. A reservation form is enclosed for the conference dinner in the Pritchard-Jones Hall, Main Arts Building, Bangor University, College Road, Bangor, LL57 2DG, on Thursday 4 July at 7.30pm. If you wish to come to the dinner, the reservation form should be completed and returned with payment to Louise Ainsworth by Monday 20 June 2013. Some places at the dinner are available to postgraduate students at half-price: bookings for these must be accompanied by a letter from an EPS member confirming the student's status.

The menu and booking form are also available to download via the EPS home page <http://www.eps.ac.uk/>. Provided you have already reserved your place at the dinner and have sent your payment cheque, please just complete the online form with your chosen menu selections and email over to Louise Ainsworth (l.ainsworth@bangor.ac.uk).

The Business Meeting will be on Thursday 4th July at 5.30pm.

The programme also includes:

Thursday 4th July, 6.00pm: 20th EPS Prize Lecture by Dr Antonia Hamilton entitled *Towards a neurocognitive framework for social interaction*.

Thursday 4th July, 3.30pm: Symposium: *Sensorimotor foundations of understanding others* (Dr Emily Cross). Speakers to include: Scott Grafton, Elisabeth J. Hill, Danielle Ropar and Dana Samson.

Wednesday 3rd July, 9.00am: Symposium: *Object recognition and representation in man and machine* (Professor Charles Leek). Speakers to include: Charles Leek, Euan Strachan, Neil A. Thacker, Guillaume Thierry, Paul Rosin and Alan Pegna.

Wednesday 3rd July, 5.30pm: 21st EPS/British Science Association Undergraduate Project Prize by Amy Gibb.

Dr Helen Cassaday
Hon. Secretary

May 2013



EXPERIMENTAL PSYCHOLOGY SOCIETY

A Business Meeting will be held at 5.30pm on Thursday 4th July 2013, at Main Arts Building, Bangor University, College Road, Bangor, LL57 2DG in Lecture Theatre 5.

AGENDA

- 1319 Minutes of the Business Meeting held on Thursday 11th April 2013, at the Management School, Lancaster University at 5.30pm.
- 1320 Matters arising
- 1321 Treasurer's Report
- 1322 Editor's Report
- 1323 Arrangements for future meetings
- 1324 Any other business

Date, time and place of next meeting

This will be held at 5.30pm, January 9th 2014, at the London scientific meeting



EXPERIMENTAL PSYCHOLOGY SOCIETY

A Business Meeting was held at 5.30pm on Thursday 11th April 2013, at the Management School, Lancaster University.

In total 19 members were initially present, but of this total not all those present were Ordinary Members of the Society. Thus under Rule 23, the meeting may not have been quorate. However, no decisions were taken.

MINUTES

- 1313 Minutes of the Annual General Meeting Business Meeting held on Thursday 3rd January 2013, in the Ground Floor Lecture Theatre, University College London, at 5.00pm.

The Minutes of the January 2013 AGM were approved and signed by the President.

- 1314 Matters arising

There were no matters arising

- 1315 Treasurer's Report

The Treasurer presented a financial summary by PowerPoint. He reported that the financial health of the Society is good with an income of £355K to date compared with £326K at the equivalent point last year. This difference is due to the receipt of the newly negotiated Royalty payment from Psychology Press. The Society's current assets stand at £660,669, compared with the previous figure of £591,055. The Treasurer advised the membership of his intention to move £150K of the Society's reserves to the Charity Bank. The Treasurer invited questions and Prof Jarrold raised the issue that if reserves increase further the Society might lose its status as a registered charity. The Treasurer replied that there are plans to increase expenditure on funding for students' and members' research, for example with the increased number of study visit deadlines, plus some small subsistence allowance which may be claimed by invited speakers and committee members.

13/16 Editor's Report

The incoming Editor reported a smooth transition in the running of the journal thanks to the efforts of Steve Tipper and his assistant Ralph Pawling, who have very helpfully provided a number of videos on how to operate the online systems. There have been 112 papers submitted to date, with an average processing time of 40 days to the first action letter. The Editor likened the journal to a steady ship in turbulent waters which nonetheless needs to move with the times. In particular, he identified the need to raise the journal impact factor (which is currently projected to decrease), and suggested initiatives to increase the impact factor, such as increasing the number of special issues. Accordingly, the Editor invited members to consider submitting proposals for special issues, particularly as the publication backlog now stands at 6 months.

13/17 Arrangements for future meetings

The Conference Secretary updated the membership on the Bangor meeting. 18 talks have already been submitted. He therefore advised members planning to submit an abstract to do so in good time.

13/18 Any other business

There was no other business.

Date, time and place of next meeting

This will be held at 5.30pm, July 4th 2013, at the Bangor scientific meeting.



KEY
Numbers in *italics* indicate the principal location.

ACADEMIC

College of Arts and Humanities 81, Academic Development Unit 1, 12
School of Creative Studies and Media 63
School of History, Welsh History and Archaeology 81
School of Linguistics and English Language 81
School of Modern Languages 81
School of Music 81, 82
School of Theology and Religious Studies 81
School of Welsh 81

College of Education and Lifelong Learning
School of Education L4, L, 6, 6, 16, 11, 12, 14
Lifelong Learning 4, 12, 13

College of Business, Social Sciences & Law
Administrative Centre 84
Bangor Business School 66, 69
Bangor Business School Management Centre 69, 68, 61, 62, 64
School of Law 67, 68
School of Social Sciences 64, 69

College of Natural Sciences
School of Chemistry, Natural Resources and Geography 26, 44
School of Biological Sciences 38, 39, 42
School of Ocean Sciences A, B
Welsh Institute of Natural Sciences
recognisingly CACS – Natural Resources 48 and the BioCompass Centre 17b & 18a Road 48

College of Health & Behavioural Sciences
School of HealthCare Sciences 27
School of Wrexham
School of Medical Sciences 89
School of Psychology 14, 46, 48, 44, 32
School of Sport, Health & Exercise Sciences 1, 6
MScAR 14, 23, 89 also at Wrexham

College of Physical & Applied Sciences
School of Chemistry 48
School of Electronic Engineering 76
School of Computer Science 76

OTHER CENTRES AND RESEARCH

Centre for Research in Mitigation 48
Colleg Dyrnwal Ceredigion Bangor branch 64
Innovation Centre Wales 29
GMM Institute of Bio-electronic and Molecular Microscopy 76

ICM Industrial and Commercial
Dyscotechnical 76
MScAR 89
Research groups within MScAR, CIMM Research Centre 29
ICMCC Research Centre 68
MScAR Trade Unit 14
MScAR Health Wales Clinical School 89
Postdoc and Innovation Centre leader construction 48
Postdoc Project Office 81
R. S. Thomas Centre (located in Main Library) 81
Welsh are Alliance Wales 76
Wales National Centre for Religious Education 11

ADMINISTRATION AND SERVICE DEPARTMENTS

Academic Registry (Admissions, Student Records & Transcripts) 81
Candidate Services 48
Careers and Employability Service 76
Corporate Communications and Marketing Department
Development and Alumni 71
Press and Public Relations 81
Student Recruitment 31
Conference and Catering 38
Oxleya, The Mixed Cycles Centre 69
ELIOS English Language Centre for Overseas Students 38
Gates and Facilities 23
Finance Office 67
Halls Office 38
Health and Safety Service 82
Human Resources 89
International Office 48
IT and Computing Services 47
Library Services 71, 32, 67, 61, 68
Office of Programme Management 61
Planning and Resources Office 81
Printing and Binding Unit (Loggafeyr Menai) 7
Registrar's Office 81
Research and Innovation Office 81, 61
Student Services 76
Students' Union 43, 79
Transition Unit 44
Wex-Chancellor's Office 81

OTHER SERVICES AND FACILITIES

Anglican Chaplaincy 71
Catholic Chaplaincy 79
John Phillips Hall 43
Mass (San Sports) Centre 18
Pope's Hall 81
Priest's-Jones Hall 81

LIBRARIES

Archives Service 81
Denial Library 47
From Healing Library 27
Health Studies Library (at Wrexham site)
Main Library 81
Main Library 89
Normal Site Library 11
Wrexham Library A

CATERING AND SOCIAL FACILITIES

Bar/Club 49
Bar Unit 33
Café Terrace 39
Café Terrace 81
Café Terrace Coffee Pod 81
Management Centre Lounge 68
Y Gylfa 4

RESIDENCES

Phildodd Site
Aldi 34
Aldi 23
Brewery (Lower Floor – Shop) 32
Café-y-Dod 35
Crafters 29
Dish 19
Dish 23
Ffrwy 38
Shops 27
Leyceun 26
Main (Ground Floor – Halls Office, Conference and Catering Office) 38
John Morris-Jones Halls
Bryn Cofon 26
Regen 26
Llanedwain 31
Llanedwain 31
Newydd Redd 17
Peta 21
Peta 23
Y Gylfa 23
Y Gylfa / Security Lodge 28

Normal Site
Newydd Arfon 2
Newydd Gwal 2

St. Mary's Site
Bryn Cofon 76

University Main Reception
University Parking (Entry card required)
Public: Pay and Display Parking

Buildings 1-14 are shown on the Normal Site map above.
Buildings 15 and 16 are shown on the School of Ocean Sciences map opposite.

KEY

Menai Bridge
A Westbay Meats & Wollton Library
B Craig Mair

Normal Site
1 Pabam
2 Newydd Gwal
3 Newydd Arfon
4 1 Storey
5 George Building
6 Caferyn and Office
7 Nantlle
8 Tylor
9 Gwynn
10 Gymnasium & Sports Hall
11 Library
12 Wrexham
13 Ardara
14 Y Wern
18 Merion
18 Ddraig

Phildodd Site
17 Newydd Redd
18 Mass Gwa Sports Centre
19 Cade
20 Dish
21 Peta
22 Aldi
23 Peta
24 Café-y-Coed
John Morris-Jones Halls
26 Bryn Cofon
26 Regen
27 Gylfa
28 Ffrwy
29 Crafters
30 1 Storey / Security Lodge
31 Llanedwain
32 Brass (Lower floor – Shop)
33 Gates and Facilities
New Site (Lower floor)
34 Aldi
35 Main (Ground Floor – Halls Office, Conference and Catering Office)
36 Leyceun

Phildodd Road
27 From Healing

Denial Road
28 Bramall
29 Gwynn
30 Adelard Alan Roberts
41 John W. Charles Owen
42 Marston
43 Robinson Bar/Club
44 Weldon
45 Peta / Lodge – Security/Support
46 Theby
47 Adelard Denial
48 Postdoc Area and Innovation Centre (under construction)

College Road
49 Psychology Block
50 Brynoria Building
51 Main University Building (Main Area)
52 Peta
53 Glyn Allen
54 Gwynn
55 Gwynn
56 Gwynn
57 Gwynn
58 College of Business, Social Sciences and Law
Administrative Centre
59 Ardara
60 Alun
61 Hugh Owen
62 Cym
63 Mbe
64 John Phillips Hall
65 Gylfa
66 Gylfa
67 Cae Gwynn
68 Lloyd Building
69 The Mass Systems Centre
70 Students Services (Statistical)
71 Carthman
72 Newydd Gwal

Dean Street
73 Welsh for Adults, Lifelong Learning, MScAR
74 School of Computer Science, School of Electronic Engineering

St. Mary's
75 Bryn Cofon
76 St. Mary's main building

Upper Bangor
77 Anglican Chaplaincy
78 Catholic Chaplaincy

Information updated from publication May 2011.