CARDDIFF MEETING

10 – 12 APRIL 2007

Joint with BAPS
A scientific meeting will be held jointly with the Belgian Association of Psychological Science Society at the Tower Building, School of Psychology, University of Cardiff on 10 - 12 April, 2007. The local organiser is Dr Dominic Dwyer.

**BAPS Lecture**

**Dr Paul W. Burgess** (Institute of Cognitive Neurosciences, University College London, UK)
The rostral PFC (area 10) attentional system: Psychological, neuroanatomical, and clinical features

The BAPS Lecture will take place at 5pm Tuesday 10th April 2007 in the SPTL, University of Cardiff.

**Fourth Mid-Career Award Lecture**

**Professor J. Aggleton** (School of Psychology, Cardiff University)
Understanding anterograde amnesia: Disconnections and hidden lesions

The Mid-Career Lecture will take place at 5.30pm Wednesday, 11th April 2007 in the SPLT, University of Cardiff.

**Symposia:**

Wednesday 11th April, 2.30pm – 5pm

Animal models of amnesia: New developments and old problems
Organisers: Dr Dominic Dwyer and Professor John Aggleton

Thursday 12th April, 2pm – 5.30pm

Conflict detection and conflict monitoring
Organisers: Dr Wim Notebaert, Dr Kathleen Maetens, and Dr Eric Soetens

**Poster Session**

Will be held on Tuesday 10th April at 6pm in the foyer of the Tower Building in conjunction with the drinks reception from the School of Psychology. Delegates may put up posters from 1pm and take them down by the end of the day.

**Presentations**

Sessions will be held in the SPLT and LT2 lecture theatres. Both theatres have OHPs and data projectors for PowerPoint presentations. Presenters are encouraged to bring their presentations ahead of time, or bring them on CD rom or USB, but may provide their own laptops (and connector leads if Mac users). The on-site computers run PowerPoint under Windows NT/2000. Any queries about facilities in the theatres should be sent to Dr Dominic Dwyer, (DwyerDM@cardiff.ac.uk) Tel: 02920 876285.

Coffee will be served in the Cybercafe, ground floor of the Tower Building.

**Receptions and Conference Dinner**

The School of Psychology, University of Cardiff welcomes delegates to a drinks reception from 6pm on Tuesday, 10th April in the Cybercafe on the ground floor of the Tower Building, School of Psychology. The conference dinner will be on Wednesday 11th April at 8pm at Aberdare Hall, Corbett Road. This dinner will be preceded by a drinks reception in the Cybercafe on the ground floor of the Tower Building, School of Psychology. A booking form for the dinner is enclosed.
Session A

SPLT Lecture Theatre

2.00  Tom Verguts* and Wim Fias* (Ghent University, Belgium)  
(Sponsored by André Vandierendonck)  
Rule-and similarity-based reasoning in a single neural network

2.30  Maarten De Schryver, Katleen Vandist, and Yves Rosseel (Ghent University, Belgium)  
Exemplar models of categorization revisited: how many exemplars do we need?

3.00  Katleen Vandist, Maarten De Schryver, and Yves Rosseel (Ghent University, Belgium)  
Semi-supervised category learning: The impact of feedback investigated in an information-integration task

3.30  TEA

4.00  Mike Le Pelley and Stian Reimers* (Cardiff University, UK and University College London, UK)  
Learned predictiveness and group perception: An associative analysis of stereotype formation

4.30  Guglielmo Calvini* and Mike Le Pelley (Cardiff University, UK)  
Breaking up social categories: To what extent can a stereotypic association be undone?

5.00  BAPS LECTURE  
Paul W. Burgess (Institute of Cognitive Neuroscience, University College London, UK)  
The rostral PFC (area 10) attentional system: Psychological, neuroanatomical, and clinical features

6.00  POSTERS AND DRINKS RECEPTION (Foyer, Cybercafe, Tower Building)
Session B

LT2 Lecture Theatre

2.00  John Wearden and Helga Lejeune* (Keele University, UK and University of Liège, Belgium)
      The beginnings of time Psychology: Vierordt's The Experimental Study of the Time Sense (1868)

2.30  Greg Goodson* and John Wearden (Keele University, UK)
      It takes time to make time: Temporal consolidation in the perception of short tones

3.00  Gruffydd Humphreys* and Marc Buehner (Cardiff University, UK)
      Temporal judgments in causal and non-causal event sequences

3.30  TEA

4.00  Jon S. Kennedy*, Marc J Buehner, and Simon K. Rushton*
      (Cardiff University, UK)
      Adaptation to temporal shifts: Learnt behaviour or perceptual-motor realignment?

4.30  Axel Cleeremans, Jean-Cristophe Sarrazin*, and Patrick Haggard
      (Universite Libre de Bruxelles, Belgium, Universite de la Mediterranee, France, and Institute of Cognitive Neuroscience, University College London, UK)
      Time, expectancy, and motor awareness

5.00  BAPS LECTURE
      Paul W. Burgess (Institute of Cognitive Neuroscience, University College London, UK)
      The rostral PFC (area 10) attentional system: Psychological, neuroanatomical, and clinical features
      (SPLT Lecture Theatre)

6.00  POSTERS AND DRINKS RECEPTION (Foyer, Cybercafe, Tower Building)
Session A

SPLT Lecture Theatre

9.00  Petroc Sumner, Parashkev Nachev*, Peter Morris, Andrew M. Peters*, Stephen R. Jackson, Christopher Kennard*, and Masud Husain (Cardiff University, UK, Division of Neuroscience, Imperial College London, UK, School of Physics and Astronomy, University of Nottingham, UK, University of Nottingham, UK, and Institute of Cognitive Neuroscience, University College London, UK)
Human medial frontal cortex mediates unconscious inhibition of voluntary action

9.30  Bert Reynvoet, Elie Ratinckx*, Karolien Notebaert, and Eva Van den Bussche* (University of Leuven, Belgium and Ghent University, Belgium)
Context effects in masked priming of two-digit numbers

10.00  Wendy De Moor*, Wim Notebaert, and Tom Verguts* (Ghent University, Belgium)
Conflict adaptation in lexical processing

10.30  COFFEE

11.00  Eva Van den Bussche and Bert Reynvoet (University of Leuven, Belgium)
The role of attention on masked priming effects in semantic categorization

11.30  Bert Timmermans*, Marijke Van Duynslaeger*, Nele Vandewaerde*, and Frank Van Overwalle (Université Libre de Bruxelles, Belgium and Vrije Universiteit Brussel, Belgium)
Subliminal manipulation of self-esteem: Evaluative conditioning or more complex processes?

12.00  Yang-Ming Huang*, Alan Baddeley, and Andrew W. Young (University of York, UK)
Attentional capture by emotional stimuli is modulated by semantic processing

12.30  Julie Bertels, Régine Kolinsky, and José Morais (Unité de Recherche en Neurosciences Cognitives, Université Libre de Bruxelles, Belgium and Fonds National de la Recherche Scientifique, Belgium)
The appeal of the forbidden fruit: Evidence for increased maintaining of attention by taboo but not by negative words

1-2  LUNCH
**Session B**

**LT2 Lecture Theatre**

**9.00**  
**Mark Suret* and Michael Le Pelley** (Cardiff University, UK)  
Cues processing mechanisms in human associative learning

**9.30**  
**Robert A. Boakes** (University of Sydney, Australia)  
The unusual properties of acquired flavour preferences in rats

**10.00**  
**Mia Schmidt-Hansen*, Simon Killcross, and Robert Honey**  
(Cardiff University, UK)  
The relationship between schizotypy and three consequences of stimulus exposure: Latent inhibition, learned irrelevance and priming

**10.30**  
**COFFEE**

**11.00**  
**Arnold Wilkins** (University of Essex, UK)  
Removing the stripes within words increases reading speed without incurring costs

**11.30**  
**Denis Drieghe*, Keith Rayner, and Alexander Pollatsek*** (Ghent University, Belgium and University of Massachusetts at Amherst, USA)  
Mislocated fixations can account for parafoveal-on-foveal effects in eye movements during reading

**12.00**  
**Zoé Hunter* and Marc Brysbaert** (Royal Holloway, University of London, UK)  
The effect of hemispheric asymmetry and interhemispheric transfer in foveal word reading

**12.30**  
**Wouter Duyck, Eva Van Assche, Denis Drieghe, and Robert Hartsuiker** (Ghent University, Belgium)  
The influence of sentence context on visual word recognition by bilinguals

**1-2**  
**LUNCH**
Session A

SPLT Lecture Theatre

2.00  Jasper Robinson* and Peter M. Jones* (University of Nottingham, UK) (Sponsored by Dominic Dwyer)
Modification of stimulus generalization by manipulation of stimulus novelty and/or familiarity

Symposium: Animal models of amnesia: New developments and old problems
Organisers: Dr Dominic Dwyer and Professor John Aggleton

2.30  Madeline Eacott* (University of Durham, UK)
Memory for objects and events in the rat

3.00  Lisa M. Saksida* and Timothy J. Bussey* (University of Cambridge, UK and MRC and Wellcome Trust Behavioral and Clinical Neuroscience Institute, University of Cambridge, UK)
What should models of amnesia model, and why does brain damage impair memory? Tests of a connectionist model of object recognition memory

3.30  TEA

4.00  Elisabeth A. Murray* (Laboratory of Neuropsychology, NIMH, USA)
Can the amygdala contribute to an animal model of amnesia?

4.30  David Gaffan (University of Oxford, UK)
New data on anterograde and retrograde amnesia in monkeys

End of Symposium

5.00  EPS Business Meeting

5.30  Fourth EPS Mid-Career Award Lecture – John Aggleton (Cardiff University, UK)
Understanding anterograde amnesia: Disconnections and hidden lesions

6.30  DRINKS RECEPTION (Cybercafe, Tower Building)

8.00  CONFERENCE DINNER, Aberdare Hall
Session B

LT2 Lecture Theatre

2.00  Sarah White*, Elisabeth Hill, and Uta Frith (Institute of Cognitive Neuroscience, University College London, UK and Goldsmiths, University of London, UK)  
Cognitive heterogeneity in the autism spectrum

2.30  Lois Grayson*, Alex Holcombe*, Petroc Sumner, and Josie Briscoe* (Cardiff University, UK, University of Sydney, Australia, and Bristol University, UK)  
Weak central coherence and cross-modal signal integration in ASD

3.00  Elizabeth Milne*, Alison Scope, Olivier Pascalis, Laurence Vigon, and David Buckley (University of Sheffield, UK)  
Atypical visual evoked potentials elicited by Gabor patches in Autistic Spectrum Disorder

3.30  TEA

4.00  Caroline Schnakers*, Manuel Schabus*, Fabien Perrin*, Steve Majerus, Gustave Moonen*, Melanie Boly*, and Steven Laureys*  
(University of Liege, Belgium, University of Salzburg, Austria, and UMR5020, CNRS - UCBL, France)  
Detection of voluntary brain activity in the acute phase of a total Locked-in syndrome

4.30  Olivia Handley*, Catriona Morrison, Chris Miles*, and Anthony Bayer (Cardiff University, UK and University of Leeds, UK)  
Genetic and familial predictors of Alzheimer's disease

5.00  EPS Business Meeting (SPLT Lecture Theatre)

5.30  Fourth EPS Mid-Career Award Lecture – John Aggleton (Cardiff University, UK)  
Understanding anterograde amnesia: Disconnections and hidden lesions (SPLT Lecture Theatre)

6.30  DRINKS RECEPTION (Cybercafe, Tower Building)

8.00  CONFERENCE DINNER, Aberdare Hall
Session A

SPLT Lecture Theatre

9.00  Géry d'Ydewalle and Aline Sevenants* (University of Leuven, Belgium)
The processing of flashbacks in movies

9.30  Mathieu Lavandier* and John F. Culling (Cardiff University, UK)
Spatial unmasking of speech in rooms: Influence of interaural coherence and attentional effects

10.00 Robert W. Hughes*, John E. Marsh*, and Dylan M. Jones (Cardiff University, UK)
Reassessing the talker variability effect in serial recall: A perceptual organization-based account

10.30 Steve Majerus and Julie Lorent (University of Liege, Belgium)
Phonological short-term memory capacity is involved in the phonological analysis stage of sentence comprehension: The case of phonetically ambiguous sentences

11.00 COFFEE

11.30 Jennifer McBride*, Ute Leonards*, and Iain D Gilchrist (University of Bristol, UK)
Flexible target representations underlie repetition priming in visual search

12.00 Christopher J. Berry*, David R. Shanks, and Richard N. A. Henson (University College London, UK and MRC Cognition and Brain Sciences Unit, Cambridge, UK)
A single-system computational model of repetition priming and recognition

12.30 Ilse Van Damme and Gery d'Ydewalle (University of Leuven, Belgium)
Amnesia versus memory distortion: How to explain reduced DRM false memory in Korsakoff patients?

1-2 LUNCH
Session B

LT2 Lecture Theatre

9.00  Karl Verfaillie and Jan Vanrie* (University of Leuven, Belgium)  Perceptual coupling of multiple point-light figures

9.30  Peter J. Hills* and Michael B. Lewis (Cardiff University, UK)  What's the difference between Tony Blair and George Bush?  Adaptation to identity specific information

10.00 Elaine Funnell, Diana Hughes*, Jacqueline Masterson, and Marc Brysbaert (Royal Holloway, University of London, UK, and University of Essex, UK)  Exploring the effect of experience on visual object naming

10.30  Fiona Phelps* and William Macken (Cardiff University, UK)  Contribution of function and form in determining object meaning

11.00  COFFEE

11.30  Jolien De Brauwer and Wim Fias* (Ghent University, Belgium)  The representation of multiplication and division facts in memory: Evidence for between-operation transfer?

12.00  Filip Van Opstal, Wim Gevers*, Wendy De Moor*, and Tom Verguts* (Ghent University, Belgium)  Dissecting the distance effect: Comparison and priming effects in numerical and non-numerical orders

12.30  Karolien Notebaert and Bert Reynvoet (Katholieke Universiteit Leuven, Belgium)  fMRI adaptation from symbolic magnitudes in parietal cortex

1-2  LUNCH
Session A

SPLT Lecture Theatre

Symposium: Attention and Control: How irrelevant information affects response selection and how control processes intervene
Organisers: Dr Wim Notebaert, Dr Kathleen Maetens, and Dr Eric Soetens

2.00 Nilli Lavie (University College London, UK)
The role of perceptual load in visual awareness

2.30 Jean-Phillippe Van Dijck* and Wim Fias* (Ghent University, Belgium)
The role of working memory load in the activation of spatial numerical associations

3.00 Robert W. Proctor*, Yanmin Zhang*, Motonori Yamaguchi*, and Kim-Phuong L. Vu* (Purdue University, USA and California State University, Long Beach, USA)
Modulation of the Simon Effect by Learned Incompatible S-R Associations

3.30 TEA

4.00 Peter Zeischka*, Kathleen Maetens*, and Eric Soetens* (Vrije Universiteit Brussel, Belgium)
Congruency modulations by repetitions of irrelevant stimulus information cannot be explained by one general attention-shift hypothesis

4.30 Wim Notebaert and Tom Verguts* (Ghent University, Belgium)
Conflict adaptation exists but it does not always reduce conflict

5.00 Nick Yeung* (University of Oxford, UK)
Drink alcohol and dim the lights: The impact of cognitive deficits on error monitoring

End of Symposium

End of Meeting


**Session B**

**LT2 Lecture Theatre**

2.00  **Nele Demeyere* and Glyn Humphreys** (University of Birmingham, UK)
Automatic statistical processing of visual properties in simultanagnosia

2.30  **Adam Harris*, Adam Corner*, and Ulrike Hahn*** (Cardiff University, UK) (Sponsored by Simon Killcross)
Estimating the probability of negative events

3.00  **Marc J Buehner, York Hagmayer*, Peter White*, and Iain Hamlin** (Cardiff University, UK and Universitaet Goettingen, Germany)
Confidence and reliability in causal learning

3.30  TEA

4.00  **Adam Corner*, Adam Harris*, and Ulrike Hahn*** (Cardiff University, UK) (Sponsored by Simon Killcross)
Bayesian updating and source reliability in psychological experiments

4.30  **Ellen Gillard, Wim Van Dooren, Walter Schaeken, and Lieven Verschaffel** (Centre for Instructional Psychology and Technology, University of Leuven, Belgium, Postdoctoral Fellow of the Research Foundation, Flanders, and Experimental Psychology, University of Leuven, Belgium)
Proportional reasoning as a heuristic-based process

5.00  **Wim De Neys** (University of Leuven, Belgium)
In two minds?: Conflict monitoring in dual process theories

End of Meeting
The effect of information frame on the accuracy of respiratory symptom perception in persons with Medically Unexplained Symptoms (MUS)

2. Aline Bompas and Petroc Sumner (Cardiff University, UK)
Compared time course of saccadic and attentional distractor effects for luminance and S-cone stimuli

3. Evelien Coppens and Debora Vansteenwegen* (University of Leuven, Belgium)
Fear conditioning: Unilateral damage to the amygdala disturbs conditioned skin conductance responses, leaving US expectancy learning intact

4. Noemy Daury* and Serge Bredart (University of Liege, Belgium)
The influence of gaze direction on awareness in recognition memory for faces

5. Natacha Deroost, Inge Zeeuws, and Eric Soetens (Vrije Universiteit Brussel, Belgium)
Negative priming in sequence learning

6. Lisa H. Evans* and Mark Haselgrove (Cardiff University, UK)
Reduced blocking is associated with the cognitive disorganisation dimension of schizotypy

7. Elisabeth Fonteneau* and Jules Davidoff (Goldsmiths College, University of London)
Neural correlates of color category processing

8. Samuel Franssens* and Wim De Neys (Catholic University of Leuven, Belgium)
Conflict monitoring in base rate neglect problems

9. Celine R. Gillebert* and Glyn W. Humphreys (University of Leuven, Belgium and University of Birmingham, UK)
Spatial bias in retrieval from VSTM following damage to left posterior ventral cortex

10. Julie Goldstein* and Jules Davidoff (Goldsmiths, University of London, UK)
Categorical perception of animal patterns

11. Helen M. Hodgetts*, Phillip L. Morgan*, and Dylan M. Jones (Cardiff University, UK)
Interrupting problem solving: Colour cues facilitate task resumption

12. Sarah Houthuys*, Dana Samson, and Glyn W. Humphreys (University of Birmingham, UK)
Belief and desire reasoning in patients with frontal lobe lesions: Evidence from novel non-verbal theory of mind tasks
13. **Christina J. Howard** and **Petroc Sumner** (Cardiff University, UK)
Attentional modulation of crowding: an equivalent noise approach

14. **Sandra Inurritegui** and **Géry d'Ydewalle** (University of Leuven, Belgium)
The cognitive superiority of bilinguals in metalinguistic awareness and executive functioning

15. **Michael B. Lewis** (Cardiff University, UK)
Eyewitness confidence and accuracy in multiple line-ups

16. **Baptist Liefooghe**, **Pierre Barrouillet**, **Andre Vandierendonck**, and **Valerie Camos** (Ghent University, Belgium, University of Geneva, Switzerland, and University of Burgundy, Dijon, France)
Working memory costs of task switching

17. **Kathleen Maetens**, **Peter Zeischka**, and **Eric Soetens** (Vrije Universiteit Brussel, Belgium)
Simon and reversed Simon effects with an accessory peripheral signal in a go-nogo two-choice task

18. **Steve Majerus**, **Brendan Weekes**, **Martine Poncelet**, and **Martial Van der Linden** (University of Liege, Belgium, University of Sussex, UK, and University of Geneva, Switzerland)
The importance of serial order short-term memory mechanisms in lexical learning: Further evidence from bilingual learners

Auditory-semantic distraction at the interface of selective attention and semantic memory

Unpredictability and context conditioning using a human conditioned suppression paradigm

21. **Nick Perham**, **John E. Marsh**, and **Dylan M. Jones** (Cardiff University, UK)
Semantic dominance in category fluency

22. **Filip Raes**, **J. Mark G. Williams**, and **Dirk Hermans** (University of Leuven, Belgium and Department of Psychiatry, University of Oxford, UK)
Concrete, process-focused processing reduces over-general memory in students

23. **Aline Sevenants**, **Walter Schroyens**, **Kristien Dieussaert**, **Walter Schaeken**, and **Géry d'Ydewalle** (University of Leuven, Belgium)
The directionality of truth table tasks
24. Michael A. Stevens*, James M. McQueen, and Robert J. Hartsuiker* (Ghent University, Ghent, Belgium and Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands)
How specific is perceptual learning of speech?

25. Arnaud Szmalec*, André Vandierendonck, and Frederick Verbruggen* (Ghent University, Belgium)
The role of inhibition in memory updating

26. Goedele Van Belle, Peter De Graef*, and Karl Verfaillie* (University of Leuven, Belgium)
Integration of information across eye movements: The influence of background and target motion

27. Marijke Van Duynslaeger*, Bert Timmermans*, and Frank Van Overwalle Vrije (Universiteit Brussel, Belgium)
Automatic goal inferences: Are direct and hidden goals alike?

28. Dinska Van Gucht, Debora Vansteenwegen*, and Omer Van den Bergh* (University of Leuven, Belgium)
Return of experimentally induced chocolate craving after extinction: Divergence between craving and US-expectancy

29. Heleen Vandromme, Adriaan Spruyt*, and Dirk Hermans (University of Leuven, Belgium)
Attitude accessibility as a moderator of correspondence between implicit and explicit self-esteem

The effect of stress and relief on sigh behaviour

31. Priya van Vooren*, Tom Beckers, and Frank Baeyens* (University of Leuven, Belgium)
Narrowing down the conditions of extinction of Pavlovian feature positive discriminations

32. Inge Zeeuws, Natacha Deroost, and Eric Soetens (Vrije Universiteit Brussels, Belgium)
The retention of conceptual, but not perceptual aspects of content information is affected by d-amphetamine
Rule-and similarity-based reasoning in a single neural network

Tom Verguts and Wim Fias
Ghent University, Belgium
tom.verguts@ugent.be

An ongoing debate in psychology concerns the extent to which human reasoning is rule-based or similarity-based. Many authors have argued that two qualitatively different systems are available. A typical study cited in favor of this view is that reported by Shanks and Darby (1998). The authors suggested that one group of participants used a rule-based reasoning strategy in their allergy-prediction task, whereas another group used a similarity-based strategy. An alternative interpretation of the data is that both groups used a similar (associative) system; but each group used different problem features to base their responses on. To illustrate the feasibility of this idea, I trained a neural network on the Shanks and Darby task. On some training occasions, the model was asked to generate an answer immediately when a problem was given. In this case, the model's generalization was similarity-based. On other occasions, I asked the network to "think for a while" before reporting its answer. In this case, the model's generalization was rule-based. The crucial difference between the two situations was the type of problem features that the model came to use for responding. Hence, qualitatively different data patterns should not necessarily be interpreted as indicating different underlying processing systems.


Exemplar models of categorization revisited: how many exemplars do we need?

Maarten De Schryver, Katleen Vandist, and Yves Rosseel
Ghent University, Belgium
Maarten.DeSchryver@Ugent.be

In most empirical studies that have been reported in the categorization literature, the exemplar models have been extremely successful. Nevertheless, the exemplar approach has been criticized by many authors. In this presentation, we focus on the following question: are all exemplars stored in memory, or is only a (small?) subset of exemplars sufficient? By replicating a number of published experiments, a more detailed analysis was possible. First, models were fit to individual-participant data instead of aggregate data. Second, an extra test phase was included. In this phase, stimuli were presented that spanned the whole stimulus-space. Although exemplar based models provided a more accurate account of the data than prototype based models, our results strongly suggest that not all exemplars need to be stored. By using a reduced set of exemplars to classify new stimuli, Reduced Exemplar models performed as well or even better than an exemplar model using a full set of exemplars.
Semi-supervised category learning: The impact of feedback investigated in an information-integration task

Kathleen Vandist, Maarten De Schryver, and Yves Rosseel
Ghent University, Belgium
Kathleen.Vandist@Ugent.be

In this presentation, we introduce a new category learning paradigm called semi-supervised classification. In a standard supervised classification paradigm, stimuli are presented one at a time, participants make a classification, and feedback (containing the true category label) follows immediately. In the semi-supervised approach, feedback is given after a pre-specified percentage of trials only. In our experiment, feedback was given in 100%, 50%, 25% and 0% of the trials respectively. The 100% condition corresponds to a standard supervised learning task, while the 0% condition corresponds to an unsupervised learning task. Previous research reported by Ashby, Queller & Berretty (1999) indicated that in the supervised condition perfect accuracy could be obtained, but not in the unsupervised condition. The goal of our experiment was to replicate the Ashby et al (1999) experiment (i.e. 100% and 0% feedback) and to extend the experiment with 50% and 25% semi-supervised conditions. Our results show that in both the 100% and 50% conditions, participants were able to achieve (nearly) maximum accuracy. In the 0% and the 25% conditions, participants were not able to learn the task. However, in a follow-up experiment, we replicated the 25% condition with twice as much trials, and observed again nearly maximum accuracy. Our results suggest that trials with no feedback have no or little impact on the learning process.


Learned predictiveness and group perception: An associative analysis of stereotype formation

Mike Le Pelley1 and Stian Reimers2
1. Cardiff University, UK
2. University College London, UK
lepelleyme@cf.ac.uk

Stereotypes are beliefs about traits or behavioural dispositions that are shared by members of a social group. Research into mechanisms of stereotype formation is complicated by the fact that a target individual can belong to several groups simultaneously (in terms of gender, age, race etc.). Stereotype formation can therefore be seen as a categorization problem, in which people learn to associate certain category features (but not others) with behavioural dispositions. What, then, determines the extent to which a given category feature is able to engage the stereotype formation process? One possibility (with its history in the field of animal conditioning) is that biases in stereotype formation might reflect the operation of associative mechanisms allowing for changes in the processing power devoted to learning about cues as a consequence of differences in the prior predictiveness of those cues. We demonstrate that this is indeed the case, and that these effects can be captured by a very simple model of associative learning.
In more general terms, these results indicate that an appreciation of the mechanisms underlying animal conditioning and associative learning can aid our understanding of relatively complex examples of human learning and social behaviour.

Breaking up social categories: To what extent can a stereotypic association be undone?

Guglielmo Calvini and Mike Le Pelley
Cardiff University, UK
CalviniG@cf.ac.uk

It has been proposed that stereotype formation depends on the extent to which people learn to associate certain traits and behavioural dispositions to certain social categories; hence, the mechanisms and biases of associative learning will govern such a process. One factor that determines the association of certain positive or negative behaviours to a specific social group is the extent to which that group has been good at predicting other events, even though these are not necessarily relevant to behaviour. Learning that membership of a social group reliably predicts neutral events will then determine the extent to which we develop and express behavioural stereotypes regarding that group in future. However, what happens if we subsequently learn that membership of a social group is an unreliable predictor? Will this be sufficient to moderate a previously acquired evaluation of the group? This prediction was tested in a series of three experiments where participants learnt about a social group's predictiveness only after forming a positive or negative evaluation of the group's behaviour. Results indicate that learning that a social group is poor at predicting neutral events only after forming a strong evaluation of it does not affect our first perception of the group.

BAPS LECTURE

The rostral PFC (area 10) attentional system: Psychological, neuroanatomical, and clinical features

Paul W. Burgess
Institute of Cognitive Neuroscience, University College London, UK
p.burgess@psychol.ucl.ac.uk

Rostral prefrontal cortex (approximating brain area 10) is a very large brain region in absolute terms, is relatively larger in humans then any other animal, and is probably the last cortical region to develop. Yet until recently there was very little evidence about the psychological functions that this region might support. We now have evidence that this brain area supports a cognitive system that plays a role in biasing between stimulus-oriented and stimulus-independent attending. Medial area 10 supports processes related to the former, and lateral area 10 supports processes that enable the latter. Four lines of supporting evidence will be presented. The first comes from human lesion studies of the performance of tasks which should tap this hypothetical construct. The second is demonstration of patterns of activation in area 10 during the performance of these tests that would be predicted by the hypothesis.
The third is findings of area 10 activations during the performance of established functions which should involve the proposed attentional system (prospective memory, context memory). In the fourth line of investigation, we examined predictions about behaviour-activation patterns within rostral PFC that follow from the hypothesis. We show with meta-analysis that these predictions are supported across different forms of neuroimaging investigations, thus establishing a general principle for functional imaging studies of this large brain region. Finally, we demonstrate empirically, using both neuropsychological and neuroimaging investigations, the plausibility of a link between dysfunction of the cognitive systems supported by rostral PFC, and the emergence of specific features of three clinical conditions: Asperger Syndrome, schizophrenia, and confabulation.

The beginnings of time Psychology: Vierordt's The Experimental Study of the Time Sense (1868)

John Wearden¹ and Helga Lejeune²
1. Keele University, UK
2. University of Liège, Belgium
j.h.wearden@psy.keele.ac.uk

This paper discusses the background to, and provides examples of results from, Karl von Vierordt's 1868 book Der Zeitsinn nach Versuchen (The Experimental Study of the Time Sense). Illustrations of "Vierordt's Law", the proposition that short durations are judged as longer than they really are, whereas long durations are judged as shorter, with an "indifference point" in between, are provided, mainly from reproduction experiments where Vierordt and his colleagues served as experimental participants. Other work from Der Zeitsinn including time discrimination and categorical timing procedures is also presented. The importance and subsequent history of studies of the "indifference point" is discussed and, finally, findings in Der Zeitsinn are linked to some contemporary research in time perception.

It takes time to make time: Temporal consolidation in the perception of short tones

Greg Goodson and John Wearden
Keele University, UK
g.goodson@ilcs.keele.ac.uk

The timing model proposed by scalar expectancy theory (SET) originally proposed that during the timing of a stimulus, a pacemaker produced pulses which were gated via a switch to an accumulator. Then, when the stimulus terminated, the accumulator contents were transferred to working memory. More recent versions of SET, however, have conflated the accumulator and working memory together, but here we present evidence that there is indeed a temporal "transfer" or "consolidation" process that occurs after a stimulus has terminated. In two experiments, people judged the durations of short tones, when these are separated by gaps, ranging from 63 ms to 1000 ms. In Experiment 1, relative duration judgements were required, and the "consolidation" process was manifested in a tendency to judge that the first stimulus was longer with increasing interstimulus delay.
Experiment 2 presented two tones and required estimates of the duration of the first, or the second. Duration estimates of the first stimulus increased with increasing interstimulus interval (consolidation effect), but effects on estimates of the second stimulus were also found.

Temporal judgments in causal and non-causal event sequences

Gruffydd Humphreys and Marc Buehner
Cardiff University, UK
Humphreysgr@cardiff.ac.uk

Previous studies (e.g. Haggard, Aschersleben, Gehrke and Prinz, 2002) have demonstrated a subjective shortening of the perceived intervals between intended actions and their effects (compared to equivalent intervals between unintended actions and their consequences) using the Libet Clock method. This talk outlines a new paradigm for the study of this "Temporal Binding" phenomenon involving the free numerical estimation of the duration between a pair of Causally related or unrelated stimuli. Results obtained with this new method suggest that Temporal Binding extends into much longer intervals than previously thought.


Adaptation to temporal shifts: Learnt behaviour or perceptual-motor realignment?

Jon S. Kennedy, Marc J. Buehner, and Simon K. Rushton
Cardiff University, UK
kennedyjs@cardiff.ac.uk

We investigated adaptation to shifts in temporal sensory-motor lags in a replication of Cunningham, Billock, and Tsou's (2001) obstacle avoidance experiment. Exposure to a temporal lag between hand movements and a visual representation of the hand movements produced a negative aftereffect (a deterioration in success rate after removal of the lag) as in their study, but it did not reach the criterion for significance. A new paradigm was used in two further experiments, which provided a more sensitive measure of aftereffects, and a measure of the rate of the decay of aftereffects. In both experiments, a significant negative aftereffect was found. When visual feedback was unavailable in the testing phase, the aftereffect persisted for at least 40 seconds. This provides limited support for the assertion that the perceived timing of sensory and motor events can be modified in response to temporal discrepancies.

Time, expectancy, and motor awareness

Axel Cleeremans¹, Jean-Cristophe Sarrazin², and Patrick Haggard³
1. Universite Libre de Bruxelles, Belgium
2. Universite de la Mediterranee, France
3. Institute of Cognitive Neuroscience, University College London, UK
axcleer@ulb.ac.be

Time plays a central role in consciousness, at different levels of information processing. Here, we focus on awareness of simple motor acts, such as pointing movements. Subjects reached for a target, which was unpredictably shifted laterally on some trials. Participants (1) expressed their expectancy of a shift, (2) pointed at the target, adjusting their movement towards the shift if required and (3) reproduced the movement just made (a measure of motor awareness). We analysed the spatial disparity between the initial and the reproduced movements on those trials with a target shift. Negative values (undershoots), suggest "motor pessimism" in that motor awareness only reflects a sluggish, reconstructed awareness of the actual movement, while positive values (overshoots) suggest "motor optimism" in that the reproduced movement is influenced more by participants' intention to point to the shifted target than by their actual movement. Expectancy strongly influenced experience of action. Further, delays inserted between expectancy, action and reproduction had no effect on visuomotor adjustment but influenced action awareness by boosting undershoots, suggesting increased reliance on a time-limited memory for action. Awareness of action is thus influenced by prior thoughts and expectations, but only over a short time period - it is a dynamic and flexible mixture of what we intend to do and of what our motor system actually does.

Human medial frontal cortex mediates unconscious inhibition of voluntary action

Petroc Sumner¹, Parashkev Nachev², Peter Morris³, Andrew M. Peters³, Stephen R. Jackson⁴, Christopher Kennard², and Masud Husain⁵
1. Cardiff University, UK
2. Division of Neuroscience, Imperial College London, UK
3. School of Physics and Astronomy, University of Nottingham, UK
4. University of Nottingham, UK
5. Institute of Cognitive Neuroscience, University College London, UK
sumnerp@cardiff.ac.uk

Within the medial frontal cortex, the supplementary eye field (SEF), supplementary motor area (SMA) and pre-SMA have been implicated in the control of voluntary action, but their precise roles remain controversial. Here we study two extremely rare patients with microlesions of the SEF and SMA to demonstrate that these areas are critically involved in unconscious and involuntary motor control. Masked prime stimuli evoked normal automatic inhibition in healthy people and a control patient with a pre-SMA lesion that spares SEF and SMA. In contrast, our SEF/SMA patients showed a complete reversal of the normal inhibitory effect - ocular or manual - corresponding to the functional subregion lesioned. These findings suggest that the SEF and SMA normally mediate automatic effector-specific suppression of motor plans.
Activation in these areas during voluntary tasks may paradoxically be attributable to this involuntary inhibitory process, rather than any higher-order aspects of voluntary control as previously supposed.

Context effects in masked priming of two-digit numbers

Bert Reynvoet\textsuperscript{1}, Elie Ratinckx\textsuperscript{2}, Karolien Notebaert\textsuperscript{1}, and Eva Van den Bussche\textsuperscript{1}
1. University of Leuven, Belgium
2. Ghent University, Belgium
Bert.Reynvoet@kuleuven-kortrijk.be

Visual masking and short stimulus onset asynchronies between prime and target were originally proposed as tools to eliminate strategic use of primes in priming studies. However, recent studies demonstrated that these manipulations are insufficient to eliminate this strategic use since context effects like target set and relatedness proportions can still influence reaction times. The present experiment further investigated these context effects on priming by examining whether task instructions influence reaction times on two-digit numbers that were preceded by a prime containing parts of the target at a congruent (3#-37) or incongruent (#3-37) position. Priming effects were influenced by task instructions (i.e. magnitude or parity judgement): in the magnitude task they were primarily mediated by the first digit of the prime, whereas in the parity task they were elicited by the second prime digit. These results are in line with recent findings that masked priming does not completely eliminate strategy use.

Conflict adaptation in lexical processing

Wendy De Moor, Wim Notebaert, and Tom Verguts
Ghent University, Belgium
Wendy.de Moor@ugent.be

In two lexical decision experiments we investigated conflict adaptation in lexical processing. We did this by studying the effect of conflict on the size of the neighbor inhibition effect. In Experiment 1, the neighbor inhibition effect was investigated in three different non-word conditions: (1) a condition in which the non-words had existing neighbor words, (2) a condition in which the non-words had no neighbors and, (3) a condition in which both non-words with and without neighbors were presented. The results showed a neighbor inhibition effect in the non-word with neighbors condition and the mixed non-word condition. We argue that this is due to the fact that non-words with neighbors cause conflict. An earlier model of lexical processing (Grainger & Jacobs, 1996) extended with top-down control was found to capture these data quite well. The results of Experiment 1 were replicated in Experiment 2 in which conflict was manipulated as a within-subjects variable. Our results show that the same regularities underlie compensatory behavior due to conflict detection in lab conflict (e.g., Stroop) tasks as in lexical processing.

The role of attention on masked priming effects in semantic categorization

Eva Van den Bussche and Bert Reynvoet
University of Leuven, Belgium
eva.vandenbussche@kuleuven-kortrijk.be

Although subliminal primes are thought to be semantically processed and attention is assumed to play an important role in semantic processing, the role of attention in subliminal semantic processing remains unclear. This study aimed to clarify this issue by investigating the response congruency effect (RCE, i.e. the latency benefit on targets where prime and target belong to the same category) under different conditions. First, the number of locations on the screen where stimuli could appear was varied. The results indicated that when subjects had to divide their attention between an increasing number of locations, the RCE decreased. Second, the direction of the attention of the participants was manipulated. Using a cue, attention was drawn to the place where the target appeared. The results showed that, when the prime appeared on the same place as the target (and was therefore attended) a clear RCE emerged. However, if the prime appeared in a different place than the target (and was therefore not attended) the RCE was clearly reduced. Thus, attention seems to play an important role in subliminal processing: when attention is divided across multiple sources of information or when the subliminal information is not attended, RCEs strongly decrease.

Subliminal manipulation of self-esteem: Evaluative conditioning or more complex processes?

Bert Timmermans¹, Marijke Van Duynslaeger², Nele Vandewaerde², and Frank Van Overwalle²
1 Université Libre de Bruxelles, Belgium
2 Vrije Universiteit Brussel, Belgium
bert.timmermans@vub.ac.be

Previous research on evaluative conditioning has demonstrated that it is possible to subliminally manipulate people's self-esteem by presenting participants with words of either a positive or negative valence coupled with a self-referent, the word "I" (Dijksterhuis, 2004; Riketta & Dauenheimer, 2003). This paper extends these findings in three ways. First, instead of words, we presented visual stimuli (faces and non-facial stimuli) coupled with a self-referent, thereby introducing a more socially relevant context. Second, we extended this by manipulating people's implicit esteem of significant others using the same method, and, third, by manipulating people's self esteem in terms of specific traits. Results indicate that people process the valence of the visual stimuli, and that people's self-esteem assimilates towards the valence of the faces, but contrasts away from the valence of non-facial pictures. This suggests that social comparison processes may play a role in this, rather than evaluative conditioning. This was confirmed by data showing that participants' self-esteem was negatively influenced when positive faces were coupled with names of significant others. In none of the experiments, an impact was found on explicit measures.


**Attentional capture by emotional stimuli is modulated by semantic processing**

Yang-Ming Huang, Alan Baddeley, and Andrew W. Young
University of York, UK
y.huang@psych.york.ac.uk

This study used the attentional blink paradigm to examine whether emotional stimuli always capture attention. The processing requirement for emotional stimuli was manipulated to investigate the circumstances under which emotional stimuli capture attention. Emotional stimuli did not cause more interference than neutral stimuli on target detection when perceptual or phonological processing of targets was required, showing that emotional processing is not as automatic as previously hypothesized. Only when semantic processing of targets was required did emotional stimuli capture more attention and increase attentional blink magnitude. Combining results from five experiments, we conclude that semantic processing can modulate the attentional capture effect of emotional stimuli.

**The appeal of the forbidden fruit: Evidence for increased maintaining of attention by taboo but not by negative words**

Julie Bertels¹,², Régine Kolinsky¹,², and José Morais¹
1. Unité de Recherche en Neurosciences Cognitives, Université Libre de Bruxelles, Belgium
2. Fonds National de la Recherche Scientifique, Belgium
ibertels@ulb.ac.be

Attentional biases are generally not observed for written words of negative emotional valence compared to neutral valence. In several experiments, we adapted the dot probe task with auditory material assuming that, as verbal oral communication is more ancient in the history of mankind than reading is, these biases would be more likely to appear. In fact, we found an attentional bias, not for negative words, but for taboo ones. Taking into account reaction times to neutral trials, we showed that this bias reflects difficulties to disengage attention from taboo words, rather than an attentional capture by them. Attention seems to be "stuck" by taboo words. Moreover, this bias was present only when the probe followed immediately the presentation of the taboo word, indicating that the influence of emotional material on attention is very rapid but does not persist. Negative words led to a more general effect, accelerating the participants' responses, suggesting that the influence of these words is not limited to some attentional component. Finally, attentional vigilance to positive material was found to be sensible to contextual effects. These results are discussed in terms of the temporal course of the emotional influence of words.
Cues processing mechanisms in human associative learning

Mark Suret and Michael Le Pelley
Cardiff University, UK
suretmb@cardiff.ac.uk

Two experiments using a novel "Mutant Scientist" paradigm investigated the role of cue processing mechanisms in the blocking effect observed in human associative learning. Experiment 1 demonstrated that blocking is correlated with a reduction in the processing (associability) of the blocked cue in agreement with the empirical findings of Kruschke and Blair (2000), but not with the analysis they offer (see also Kruschke, 2006). Rather our results seem to be more in line with the predictions of the attentional model of Mackintosh (1975). One alternative explanation for the results of Experiment 1 is that rather than associability being based on the relative predictiveness of cues as proposed by Mackintosh's model, the associability of a cue is proportional to the absolute amount of associative strength it has accrued previously. As a test of these ideas, Experiment 2 provides a human analogue of the reblocking effect found in animals. The results of this experiment show that it is the relative, rather than the absolute predictiveness of a cue which determines the strength of processing. This is once again consistent with the model of Mackintosh (1975).


The unusual properties of acquired flavour preferences in rats

Robert A. Boakes
University of Sydney, Australia
bobb@psych.usyd.edu.au

Classical conditioning typically displays two basic properties. Extinction refers to the decline in a conditioned response that is produced by repeated non-reinforced presentations of the conditioned stimulus. Latent inhibition refers to retarded acquisition produced by giving non-reinforced presentations of the conditioned stimulus prior to the start of the conditioning procedure. Unusually, flavour preference conditioning can be highly resistant to extinction. Thus, after experiencing on a few occasions a flavour such as almond (A) mixed with sucrose (S), a thirsty rat will display a preference for almond-flavoured water when given a choice between this and plain water (A vs W test). Subsequent introduction of the extinction procedure of repeatedly presenting almond in the absence of sucrose can leave the almond preference intact. The experiments reported here indicate that acquisition of a flavour preference in this manner is little affected by whether the flavour is familiar or not.
Thus, rats pre-exposed many times to A before being given the AS mixture acquire a preference for A as readily as rats for which A is novel. These results are intriguingly similar to those found for some types of human evaluative conditioning.

The relationship between schizotypy and three consequences of stimulus exposure:
Latent inhibition, learned irrelevance and priming

Mia Schmidt-Hansen, Simon Killcross, and Robert Honey
Cardiff University, UK
Schmidthansenm1@cf.ac.uk

Simple exposure to a stimulus has a number of marked effects on subsequent behaviour. It can retard the rate at which a stimulus is subsequently learnt about (e.g., in demonstrations of latent inhibition and learned irrelevance) and can facilitate later stimulus identification (e.g., in demonstrations of priming). Previous research suggests that latent inhibition, and the attentional process that is often presumed to underlie it, is disrupted in participants who have high schizotypy scores. However, in our studies while learned irrelevance and priming were disrupted in such participants, latent inhibition was not. These results show that, at least under some circumstances, latent inhibition is preserved in participants with high schizotypy scores; and imply that one must look to the disruption of processes other than those involved in latent inhibition to explain the relationship between high levels of schizotypy and both learned irrelevance and priming.

Removing the stripes within words increases reading speed without incurring costs

Arnold Wilkins
University of Essex, UK
arnold@essex.ac.uk

The speed with which a word can be read is determined in part by the similarity between the neighbouring vertical strokes of the component letters, as measured by the height of the first peak in the horizontal autocorrelation of the image of the word. This applies: (1) to words containing ascenders and descenders and those without; (2) when the words are presented singly or as a paragraph; (3) regardless of the separation of lines within the paragraph. The peak in the horizontal autocorrelation can be reduced: (1) by distorting each word along the horizontal dimension so as to compress the word near its centre and stretch it near its ends, leaving the overall word length unchanged; (2) by compressing letters to increase the space between them and then varying their horizontal position; (3) by minimally redesigning those letters that contribute to trigrams having maximum autocorrelation. These measures can improve reading speed without affecting type economy. It may well be possible to improve reading speed quite generally though a minimal structured redesign of founts. Such measures are likely to benefit readers who suffer visual stress and who are particularly susceptible to the perceptual distortions from spatially repetitive patterns.
Mislocated fixations can account for parafoveal-on-foveal effects in eye movements during reading

Denis Drieghe¹, Keith Rayner², and Alexander Pollatsek²
1. Ghent University, Belgium
2. University of Massachusetts at Amherst, USA
denis.drieghe@ugent.be

Contrasting predictions of serial and parallel views on the processing of foveal and parafoveal information during reading were tested. A high-frequency adjective (e.g. young) was followed by either a high-frequency (e.g. child) or low-frequency word n (e.g. tenor), which in turn was followed either by a correct (e.g. performing) or an orthographic illegal word n+1 (e.g. pxvforming) as a parafoveal preview. A limited parafoveal-on-foveal effect was observed: there were inflated fixation times on word n when the preview of word n+1 was orthographically illegal. However, this parafoveal-on-foveal effect was a) independent of the frequency of word n, b) restricted to those instances when the eyes were very close to word n+1, and c) associated with relatively long prior saccades. These observations were all compatible with a mislocated fixation account in which parafoveal-on-foveal effects result from saccadic undershoots of word n+1 and with a serial model of eye movement control during reading.

The effect of hemispheric Asymmetry and interhemispheric transfer in foveal word reading

Zoé Hunter and Marc Brysbaert
Royal Holloway, University of London, UK
zoe.hunter@rhul.ac.uk

The left cerebral hemisphere is dominant for language processing in most individuals. It has been suggested that this asymmetric language representation can influence behavioral performance in foveal word naming tasks. We carried out two experiments in which we obtained laterality indices by means of functional imaging during a mental word generation task, using fTCD and fMRI respectively. Subsequently, we administered a behavioral word naming task, where participants had to name foveally presented words of different lengths shown in different fixation locations shifted horizontally across the screen. The optimal viewing position (OVP) for left language dominant individuals is located between the beginning and the centre of a word. It is shifted towards the end of a word for right language dominant individuals and, to a lesser extent, for individuals with bilateral language representation. These results demonstrate that interhemispheric communication is required for foveal word recognition. Consequently, asymmetric representations of language and processes of interhemispheric transfer should be taken into account in theoretical models of visual word recognition to ensure neurological plausibility.
The influence of sentence context on visual word recognition by bilinguals

Wouter Duyck, Eva Van Assche, Denis Drieghe, and Robert Hartsuiker
Ghent University, Belgium
wouter.duyck@ugent.be

Recent research on bilingualism has shown that lexical access in visual word recognition by bilinguals is not selective with respect to language. The present study investigated language-independent lexical access in bilinguals reading sentences, which constitutes a strong unilingual linguistic context. In the first experiment, Dutch-English bilinguals performing a L2 lexical decision task were faster to recognize identical and non-identical cognate words (e.g. banaan # banana) presented in isolation than control words. A second experiment replicated this effect when the same set of cognates was presented as the final words of low-constraint sentences. In a third experiment, a cognate facilitation effect was found for self-paced reading times on the region that followed the target, but only for identical cognates. In a fourth experiment using eyetracking, we showed that early target reading time measures also yield cognate facilitation, but only for identical cognates. These results suggest that a sentence context may influence, but does not annul, cross-lingual lexical interactions during early visual word recognition by bilinguals.

Modification of stimulus generalization by manipulation of stimulus novelty and/or familiarity

Jasper Robinson and Peter M. Jones
University of Nottingham, UK
jasper.robinson@nottingham.ac.uk

Stimulus generalisation is the finding that, e.g., a conditioned response established to stimulus A will be seen to a second stimulus B also. Stimulus generalisation is indicative of the proportion of stimulus features shared by A and B: the greater that proportion, the greater the scope for generalisation. Stimulus features are taken to correspond only to fixed, physical stimulus properties (e.g., pitch); but it has been claimed that stimulus novelty and, or familiarity may be encoded as stimulus features too. Our experiments investigated that suggestion. Rats in operant chambers received A-UCS (unconditioned stimulus) pairings before generalisation testing to B. Before A-UCS pairings and B tests, different groups of rats received nonreinforced stimulus preexposure; for one group, both A and B were preexposed and this was intended to add an additional common stimulus feature (“familiarity”). As anticipated, this treatment was found to enhance stimulus generalisation. The implications of these findings for theories of stimulus representation will be discussed.
Symposia: Animal models of amnesia: new developments and old problems
(to accompany the Mid-Career Award Lecture)
Organisers: Dr Dominic Dwyer and John Aggleton

Memory for objects and events in the rat

Madeline Eacott
University of Durham, UK
m.j.eacott@durham.ac.uk

Recent work in the lab has examined complex memory for objects in the rat. By using variations on the classic spontaneous recognition task, we have investigated memory for objects in configurations with spatial locations and with contexts. In doing so, we have examined the nature of episodic-like memory in non-human animals and have proposed a novel model of episodic-like memory which involves an integrated, flexible memory for objects (what), their location (where) and the context in which they were found (which). Using this approach, termed what-where-which, we are exploring the neural basis of episodic-like memory.

What should models of amnesia model, and why does brain damage impair memory?
Tests of a connectionist model of object recognition memory

Lisa M. Saksida¹ and Timothy J. Bussey²
1. University of Cambridge, UK
2. MRC and Wellcome Trust Behavioral and Clinical Neuroscience Institute, University of Cambridge, UK
lms42@cam.ac.uk

Impairment in object recognition is the canonical behavioural model of amnesia. Studies of object recognition memory have helped elucidate the anatomical structures involved in memory, indicating a particularly critical role for one such structure, the perirhinal cortex. We offer a mechanistic account of the effects of perirhinal cortex damage on object recognition memory, based upon the assumption that perirhinal cortex stores representations of the conjunctions of visual features possessed by complex objects. The account is instantiated in a connectionist model, in which development of object representations with visual experience provides a mechanism for judgment of prior occurrence. We first present simulations showing how the model can account for the classical effects of brain damage on object recognition memory: (1) delay-dependent impairments, (2) item list length-dependent impairments, and (3) the observation that impairments are revealed only when stimuli are trial-unique, rather than repeatedly presented. Second, we present three experiments that provide support for the model. These experiments show that to model ‘amnesia’ comprehensively in animals we need to consider other factors in addition to merely faster forgetting across a delay: amnesia, at least ‘perirhinal amnesia’, includes perceptual impairments, impairments in stimulus binding, and a heightened susceptibility to perceptual interference. In addition, the success of the model in simulating these findings shows that it is possible to account for object recognition impairments following damage to perirhinal cortex within a hierarchical, representational framework, in which complex conjunctive representations in perirhinal cortex play a critical role.
Can the amygdala contribute to an animal model of amnesia?

Elisabeth A. Murray
Laboratory of Neuropsychology, NIMH, USA
murraye@mail.nih.gov

The amygdala (A) constitutes part of a neural network for achieving biologically important goals, in part through learning based on rewards. It also contributes importantly to emotion. To explore A contributions to memory rhesus monkeys with bilateral, selective A lesions were evaluated on three tasks of reward-based learning and emotion: (1) reinforcer devaluation, (2) object-reversal learning, and (3) emotional responses to a fake snake. Removal of A, unlike damage to nearby temporal lobe structures such as the perirhinal cortex and hippocampus, impairs performance on the reinforcer devaluation task, in which a food’s current value changes, but reward contingencies do not. Thus, monkeys with A lesions fail to associate objects with the current value of foods (an affective signal). Control tasks rule out alterations in visual discrimination abilities, food preferences, motivation levels, discrimination of internal state, or satiety mechanisms as accounts for this finding. In addition, A lesions attenuate instinctive emotional responses to a snake. These results suggest two conclusions: 1) Because many forms of learning and memory (e.g., object recognition, arbitrary S-R and object-reversal learning) require no contribution from the A, the specific contribution of the A to memory lies in linking affect to information stored in other brain structures; 2) The “medial temporal lobe” is not a unitary entity.

New data on anterograde and retrograde amnesia in monkeys

David Gaffan
University of Oxford, UK
David.gaffan@psy.ox.ac.uk

Clinical amnesia results from lesions that typically involve two type of damage, namely, loss of cortical neurons and disconnection of cortical-subcortical interactions. Animal experiments can disconfound these two. Loss of cortical neurons, without further interruption of cortical interaction with nonspecific subcortical structures, impairs retrieval of pre-morbid memories (retrograde amnesia) more than it impairs acquisition of new memories (anterograde amnesia). This effect is the same, whether the neurons lost are from the putative "medial temporal memory system" (hippocampus or perirhinal cortex) or not (prefrontal cortex or lateral temporal cortex). Therefore, the loss of cortical neurons, whether in a putative "medial temporal memory system" or not, cannot explain the disproportionately severe anterograde amnesia that is seen in organic amnesia. Disproportionately severe anterograde amnesia is specifically the result of cortical-subcortical disconnection, either of temporal cortex or of prefrontal cortex.

End of symposium
Fourth EPS Mid-Career Award Lecture

Understanding anterograde amnesia: Disconnections and hidden lesions

John P. Aggleton
Cardiff University, UK
aggleton@cf.ac.uk

Three emerging strands of evidence are helping to resolve the causes of the anterograde amnesia associated with damage to the diencephalon. New anatomical studies have refined our understanding of the links between diencephalic and temporal brain regions associated with amnesia. These studies direct attention to the limited numbers of routes linking the two regions. Neuropsychological studies of patients with colloid cysts confirm the importance of one of these routes, the fornix, for the recall of episodic information. By combining these data strong evidence emerges for the view that damage to hippocampal – mammillary body – anterior thalamic interactions is sufficient to induce amnesia. An integrating link in this functional system is provided by the retrosplenial cortex as recent evidence indicates that this area suffers ‘covert’ pathology (i.e. it is functionally lesioned) following damage to the anterior thalamic nuclei or hippocampus. This common, indirect ‘lesion’ effect on the retrosplenial cortex not only broadens our concept of the neural basis of amnesia but may also help to explain the many similarities between temporal lobe and diencephalic amnesia.

Cognitive heterogeneity in the autism spectrum

Sarah White¹, Elisabeth Hill², and Uta Frith¹
1. Institute of Cognitive Neuroscience, University College London, UK
2. Goldsmiths, University of London, UK
s.white@ucl.ac.uk

Three main theories have attempted to characterise autism at the cognitive level: theory of mind (ToM), executive function (EF) and central coherence (CC); but none are able to account for all the behavioural manifestations seen across different children. In order to investigate cognitive heterogeneity within the autism spectrum and how this relates to reported behaviour, 57 high-functioning 7-12 year olds with autism spectrum disorder (ASD) and 27 normally-developing children performed tasks tapping into these three cognitive domains. Their parents completed interviews concerning their behavioural symptoms. Support for all three theories was found, with significant group differences between the ASD and control groups. We then identified the children who showed detectable impairment, defined as performance below the control group 5th percentile, in each cognitive domain. Approximately 50% of the children with ASD displayed a ToM impairment, 33% executive dysfunction and 20% weak CC, and all possible combinations were found. A further puzzling 40% of children displayed no detectable impairment. ToM and EF abilities were closely related whilst CC was independent of these skills, indicating that at least two cognitive subtypes were present in the current sample. However, only ToM and verbal ability were found to predict specific aspects of the behavioural triad.
Weak central coherence and cross-modal signal integration in ASD

Lois Grayson¹, Alex Holcombe², Petroc Sumner¹, and Josie Briscoe²
1. Cardiff University, UK
2. University of Sydney, Australia
3. Bristol University, UK
graysonl@cardiff.ac.uk

Weak central coherence (WCC) is a cognitive theory that accounts for many superior [and inferior] abilities associated with autistic spectrum disorders (ASD). The theory states that autism reflects a preference for processing local details of stimuli at the expense of global representation formation. However it remains debated whether WCC results from a top-down modulation of low-level processing (Frith, 2003), or has a largely perceptual basis (Jarrold, Gilchrist & Bender, 2005). One specific hypothesis suggests that WCC in ASD is related to local signal integration deficits (Bertone, Mottron, Jelenic & Faubert, 2005). To date, research supporting signal integration differences in ASD has primarily investigated separate sensory modalities. Here, we examined audio-visual integration in a perceptual causality illusion. Compared to age-matched peers, children with ASD showed less influence from auditory signals in their visual perception of ambiguous dynamic stimuli. These results support the notion of perceptual atypicalities serving as the basis for WCC, and extend the hypothesis by suggesting cross-modal signal integration weakness in autism.


Atypical visual evoked potentials elicited by Gabor patches in Autistic Spectrum Disorder

Elizabeth Milne, Alison Scope, Olivier Pascalis, Laurence Vigon
and David Buckley
University of Sheffield, UK
E.Milne@Sheffield.ac.uk

There are reports of atypical visual perception in individuals with autistic spectrum disorders, yet the nature of such atypical perception is unclear. The aim of the work reported here is to investigate basic visual perception in participants with autistic spectrum disorder (ASD) by measuring the visual potential elicited by simple visual stimuli in children with ASD and typically developing controls.
The VEP elicited by Gabor patches presented at different spatial frequencies (0.5 to 8 cycles per degree) was measured. We found significant differences in the VEP elicited in the two groups, suggesting atypical cortical activity associated with visual perception in autism. The data strongly suggest that atypical perception in autism occurs at an early stage of processing, is evident following presentation of very simple visual stimuli, and reflects a low-level abnormality within the visual system.

Detection of voluntary brain activity in the acute phase of a total Locked-in syndrome

Caroline Schnakers¹, Manuel Schabus¹,², Fabien Perrin³, Steve Majerus¹, Gustave Moonen¹, Melanie Boly¹, and Steven Laureys¹
1. University of Liege, Belgium
2. University of Salzburg, Austria
3. UMR5020, CNRS - UCBL, France
C.Schnakers@student.ulg.ac.be

The assessment of consciousness, actually, is still a very tricky issue, for both methodological and conceptual reasons. In this study, we use electrophysiological measures (EEG) to assess conscious awareness in a paralyzed patient unable to show any purposeful motor behavior, as a result of Locked-in syndrome (LIS). The LIS is caused by lesions to the brainstem and results in tetraplegia, anarthria but preserved awareness and cognition. Communication is sometimes possible through preserved vertical eye movements. Here we report the detection of voluntary brain activity in a 21-year-old woman with an acute total LIS using evoked potentials and EEG time-frequency analysis. We designed an active event-related paradigm where the patient had to count either her own first name or another unfamiliar first name. Similar to four age-matched controls, a significant higher P3 amplitude was observed when the patient counted her own first name as compared to passive condition. Time-frequency analysis revealed significant alpha-beta responses when counting another name as compared to passively listening. In conclusion, the active paradigm permits to detect voluntary brain activity in patients that behaviourally would be diagnosed as comatose. Additionally, EEG analysis in the frequency domain can potentially identify otherwise undetected residual cognitive processing in severely brain injured patients.

Genetic and familial predictors of Alzheimer's disease

Olivia Handley¹, Catriona Morrison², Chris Miles¹, and Anthony Bayer¹
1. Cardiff University, UK
2. University of Leeds, UK
handleyo@cardiff.ac.uk

Recent work from our lab has highlighted a complex role for both genotype and familial risk as predictors of early signs of cognitive decline (Handley et al., 2006). Further to this finding, the work presented here involves a broader assessment of cognitive functioning in older adults and the identification of early cognitive changes that might be suggestive of incipient AD in population samples at known risk of developing the disease. A sample of siblings (n=47) related to probable AD cases and an age-matched control sample (n=71) were recruited.
All participants were genotyped for the presence of the apoE e4 allele. Performance on a battery of neuropsychological tasks was compared according to family history of AD and apoE e4 status. Siblings showed a performance decrement on all neuropsychological measures, but in particular, on the measures of naming ability, pattern recognition memory and general cognitive status. For apoE e4 status, carriers compared to e4 non-carriers, e4 carriers showed small impairments on the majority of tasks, although none was significant. There was no evidence of an interaction between risk factors. These findings are interpreted as indicating that both risk factors, but in particular, family history, are important in identifying those likely to progress to AD.


The processing of flashbacks in movies

Géry d'Ydewalle and Aline Sevenants
University of Leuven, Belgium
gery.dydewalle@psy.kuleuven.be

Principles of narrative and intellectual film editing were investigated by assessing the semantic, cognitive, and aesthetic consequences of inserting flashbacks. A short narrative film was presented, either with flashbacks or in chronological/linear order. In Experiment 1, the gravity of the acts committed by the two main actors was perceived to be more salient in the linear than in the flashback version (based on Osgood's semantic differential ratings). Aesthetic assessment did not vary as a function of the linearity. In reconstructing the movie segments into the right order, the linear film condition showed a better match with the chronological ordering than the flashback condition. In Experiment 2, pupil size of the viewers, as a measure of mental load, was registered on-line. In the flashback version, mental load was heightened due to the flashbacks disrupting the linear story grammar. In the discussion about distinctive advantages of intellectual versus narrative editing, intellectual editing lost the case in the present study. Flashbacks did not enhance aesthetic judgments, and linearity emphasized the semantic features of the leading actors with less consumption of mental resources.

Spatial unmasking of speech in rooms: Influence of interaural coherence and attentional effects

Mathieu Lavandier and John F. Culling
Cardiff University, UK
lavandierm@cardiff.ac.uk

Speech Reception Thresholds were measured to investigate the influence of a room on spatial unmasking of speech. The listening tests were realized under headphones. A room simulation was used, that allowed positioning of the interferer and target at chosen positions, as well as varying the absorption coefficient of the walls. The measurements involved running speech and different types of interferer (speech-shaped noise, one voice or two voices).
The two first experiments showed that spatial unmasking is preserved but greatly reduced in reverberation. The following experiments revealed that spatial unmasking is not dependent only on the azimuth separation of sound sources, but also on the coherence of the waveforms at the ears. This last parameter was varied independently for interferer and target. Speech intelligibility decreased as the coherence of sources was degraded by sound reflections in the room. The influence of the interferer coherence is in agreement with the binaural unmasking theory, whereas the influence of the target coherence seems linked to the inherent degradation of speech in reverberation. Attentional effects associated with the listening task were also involved. They seemed dependent on the degree of similarity between interferer and target.

Reassessing the talker variability effect in serial recall: A perceptual organization-based account

Robert W. Hughes, John E. Marsh, and Dylan M. Jones
Cardiff University, UK
HughesRW@cardiff.ac.uk

Auditory serial short-term memory is impaired if the to-be-remembered items are spoken in different voices (e.g., alternating male-female voices). Extant accounts of this talker-variability effect are item-based and couched in terms of classical short-term memory theory: having to either normalize or incorporate the changing speaker information impairs the item-encoding process thus promoting item-decay in short-term memory. In the present study, we test a novel account whereby the difficulty arises instead because automatic perceptual organization processes yield order cues that are incompatible with the action-demand to produce the items in their objective temporal order. We reasoned that according to the perceptual organization account, such perception-action incompatibility would be exacerbated by pre-exposure to the alternating voice-pattern characterising the ensuing list (implemented as a spoken countdown into the to-be-remembered list) and hence accentuate the talker-variability effect. In contrast, such pre-exposure should, if anything, facilitate speaker-normalisation or speaker-incorporation processes and, according to these accounts, attenuate the effect. The results showed that the talker variability effect was reliably larger in the presence of a lead-in suggesting that this effect, like many other apparently mnemonic effects, may be re-ascribed to the action of auditory perceptual organization.

Phonological short-term memory capacity is involved in the phonological analysis stage of sentence comprehension: The case of phonetically ambiguous sentences

Steve Majerus and Julie Lorent
University of Liege, Belgium
smajerus@ulg.ac.be

The role of phonological short-term memory (pSTM) in sentence comprehension is a controversial issue. We propose here that pSTM is involved in phonological analysis but not later stages of sentence comprehension.
We tested this hypothesis by comparing pSTM capacity and processing times for phonetically ambiguous (PA) words embedded in sentences. PA words contained an initial stop consonant with an ambiguous voice onset time; e.g., the PA stimulus [b*ul] could be identified either as [bul] or [pul], both being familiar French words. The sentences (50% contained a PA word) were presented for a sentence anomaly judgment task to 55 French speaking participants; they initiated themselves the auditory presentation of each successive word allowing us to measure processing times for each individual word. pSTM capacity was measured via word and nonword immediate serial recall tasks. As expected, we observed significantly increased processing times for PA words, relative to same position non-PA stimuli. pSTM measures correlated with the size of this phonetic ambiguity effect. However, pSTM capacity did not correlate with total response time for sentence anomaly decision at the end of the sentence. These results highlight the role of pSTM in early phonological analysis but not in semantic aspects of sentence comprehension.

Flexible target representations underlie repetition priming in visual search

Jennifer McBride, Ute Leonards and Iain D. Gilchrist
University of Bristol, UK
Jen.Mcbride@bristol.ac.uk

Repetition priming occurs in visual search: repeating target features across consecutive search trials can influence RT. However, it remains unclear what representation of the target, stored across trials, leads to this priming. To investigate how priming is affected by feature type and the roles that features play in target definition, we manipulated the roles of colour and orientation in defining the search target. In Experiment 1, the target differed from distractors in orientation while target colour was irrelevant to the search. Repeating irrelevant target colour produced significantly faster RTs, but repeating task-relevant orientation slowed RTs. In Experiment 2, the roles of colour and orientation were reversed: the target now differed from distractors by its colour while target orientation was irrelevant. Again, a significant RT advantage was found for repeating target colour, but no cost or benefit was found for repeating orientation. These results indicate that the nature of the target representation stored across trials critically depends on the role of target features in the task and that different features impact differently on this representation. Existing feature-based (e.g. Maljkovic & Nakayama, 1994) and episodic memory-based (e.g. Huang, Holcombe & Pashler, 2004) explanations of priming are unable to account for both effects.


A single-system computational model of repetition priming and recognition

Christopher J. Berry¹, David R. Shanks¹, and Richard N. A. Henson²
1. University College London, UK
2. MRC Cognition and Brain Sciences Unit, Cambridge, UK
christopher.berry@ucl.ac.uk

We present two applications of a single-system model of repetition priming and recognition memory, which is conceptually similar to signal-detection theory. Firstly, experiments were conducted to examine the effects of a manipulation of selective attention at study on later priming (in a perceptual identification task) and recognition performance (old/new judgments). Adverse effects of reductions in attention were found for priming and recognition, albeit greater for recognition. Split-half correlations indicated that recognition performance was reliable, but priming performance was not. Both findings were predicted by the model. Secondly, the model was applied to some compelling evidence from amnesic patients for multiple memory bases of priming and recognition. Conroy et al. (2005) reported relatively preserved levels of priming and fluency (the tendency to judge faster identified items as old) in amnesic patients despite impaired or near-chance recognition. This dissociation was accounted for with the model by simply assuming that there is a large degree of noise in the encoding and assessment of the memory signal in amnesia. The simulation results suggest that, contrary to previous interpretation, this dissociation is not inconsistent with a single-system account.


Amnesia versus memory distortion: How to explain reduced DRM false memory in Korsakoff patients?

Ilse Van Damme and Gery d’Ydewalle
University of Leuven, Belgium
Ilse.VanDamme@psy.kuleuven.be

Although false memories have been studied extensively within the field of cognitive psychology, cognitive neuropsychological false memory research has been rather limited. Recently, however, the Deese/Roediger-McDermott (DRM) paradigm has been used to explore illusory memories in patients with amnesia, such as Korsakoff patients. Results not only revealed impairments in true memory, but also in false memory for semantically related words (i.e., diminished false memory). The present experiments examined whether this could be attributed to a semantic encoding deficit or rather to problems with explicitly retrieving the semantic gist at test. Performance of Korsakoff patients and memory-intact controls was investigated in two different versions of the DRM paradigm. In Experiment 1, both associative and categorized word lists were presented, with the order of recall and recognition tests manipulated between-subjects. An implicit word stem completion task was used in Experiment 2.
The results of both studies emphasize the importance of the distinction between automatic and intentional retrieval: Although the data do leave room for an additional deficit in strategic encoding, Korsakoff patients’ explicit recollection problems seem to be crucial in explaining reduced false memory. Nevertheless, evidence is also obtained that automatic retrieval can suffice to induce illusory memories.

Perceptual coupling of multiple point-light figures

Karl Verfaillie and Jan Vanrie
University of Leuven, Belgium
karl.verfaillie@psv.kuleuven.be

When confronted with multiple bistable stimuli at the same time, the visual system tends to generate a common interpretation for all stimuli. We exploit this perceptual-coupling phenomenon to investigate the perception of depth in bistable point-light figures. Observers indicate the global depth orientation of simultaneously presented biological-motion figures while the similarity between the stimuli is manipulated. In a first experiment, a higher occurrence of coupled percepts is found for identical figures, but coupling breaks down when either the movement pattern or both the viewpoint and the phase-relation are changed. A second experiment confirms these results, but also demonstrates that different point-light actions can be subject to perceptual coupling as long as they share the same viewpoint and exhibit equivalent degrees of perceptual ambiguity. The data are consistent with an explanation in terms of differential contributions of stored, view-dependent object and action representations and of an interaction between stages processing local stimulus features.

What’s the difference between Tony Blair and George Bush? Adaptation to identity specific information

Peter J. Hills and Michael B. Lewis
Cardiff University, UK
HillsPJ@Cardiff.ac.uk

Adaptation to a distorted face causes the appearance of subsequent faces to be distorted in the opposite direction. Adapting to the visual identity of a particular face causes an average face to take on the identity of an ‘opposite’ identity, even if the view is changed. If this effect is based on identity, then any aspect of identity (including names, voices, and other semantic information) should cause visual adaptive effects, whereas if the effect is based purely on visual identity then only similar visual stimuli will cause the effects. A series of studies are reported here that have psychometric functions fitted pre- and post-adaptation to various class of stimuli representing identity. Significant adaptation effects (whereby the adaptation identity was harder to detect in a series of morphs post-adaptation) were observed for visual images, caricatures, an associated person, name, and voice, but not semantic information. These results are explained within the neural network architecture of the IAC, whereby the PIN is adapted through the NRU, VRU, and FRU, but spreading activation prevents adaptation through non-specific SIUs.
Exploring the effect of experience on visual object naming

Elaine Funnell¹, Diana Hughes¹, Jacqueline Masterson², and Marc Brysbaert¹
1. Royal Holloway University of London, UK
2. University of Essex, UK
E.funnell@rhul.ac.uk

Age-of-acquisition is a powerful and reliable predictor of the speed with which adults name visually-presented objects. The question we explore in this paper is whether the changing nature of experience across age can explain the age-of-acquisition effect. To investigate the effects of current adult experience of objects on object naming, we collected ratings of concept familiarity and found significant moderate correlations with adult naming speed that failed to predict naming performance to a significant level. The data showed that this was because early-acquired objects with low ratings of adult familiarity were named as quickly as those with high ratings of familiarity. The 'Quality of Experience' theory of visual object naming (Funnell, Hughes and Woodcock, 2006) proposes that object names learned early in life are associated particularly with perceptual knowledge. To test this hypothesis, we collected ratings of imageability using the classic instructions which emphasise the ease with which an image can be experienced. We obtained correlations that did not differ in significance from correlations with objective measures of age-of-acquisition and furthermore were significantly higher for objects acquired earlier rather than later in life. We conclude that early-acquired objects are named more quickly than later-acquired objects because the perceptual properties of these objects are better known.


Contribution of function and form in determining object meaning.

Fiona Phelps and William Macken
Cardiff University, UK
PhelpsFG1@cardiff.ac.uk

Evidence suggests an object's function is a primary determinant of its meaning, with faster judgements about function than form, and functional information being obligatorily activated whenever any semantic processing occurs (Phelps et al., 2006). Extending this we measured the semantic processing of form-function feature pairs for which the form (<blade>) is necessary to enable the function (<cuts>). In Experiment 1, participants judged the frequency with which the form and function components of such feature pairs occur in the world. Despite their objective equivalence, function features were deemed more common than form features, suggesting function provides a more efficient retrieval cue for semantic memory than form. Experiment 2 considered the role of affordance (Gibson, 1979), by using forms which either afford a function (knives possessing blades allow humans to cut) or not (rabbits possessing eyes don't allow humans to see).
A two-stage feature verification task (stage 1: 'is feature A true of concept X?'; stage 2: 'is feature B true of concept X?'), enabled manipulation of feature order (form=>function, function=>form) and affordance relation (present, absent). Obligatory activation of function obtained only when an affordance relation existed, suggesting affordance plays a key role in the prominence of function in determining object meaning.


The representation of multiplication and division facts in memory: Evidence for between-operation transfer?

Jolien De Brauwer and Wim Fias
Ghent University, Belgium
jolien.debrauwer@ugent.be

Simple multiplication facts (e.g., 3 x 4) are represented in memory (see e.g., Verguts & Fias, 2005), but until now there is no consensus regarding the representation of the corresponding division facts (e.g., 12 : 3). Are division problems solved by making use of the memory network for multiplications? Or do we have a separate memory representation for division facts? Two experiments were set up to investigate this issue. In a first experiment, one group of participants was trained on large multiplication problems; the other group on large division problems. Their performance on both operations was measured before and after training. Interestingly, transfer of learning was observed from multiplication to division, but not the other way round. However, as the training in this experiment was restricted within a one hour session, the lack of division to multiplication transfer could be due to the fact that training was not intensive enough. In a second experiment participants were trained more intensively (over two sessions) on a subset of large division problems. Their performance on both operations was measured before and after training. The results give a clear picture about the relation between the memory representations of simple multiplication and division facts.


Dissecting the distance effect: Comparison and priming effects in numerical and non-numerical orders

Filip Van Opstal, Wim Gevers, Wendy De Moor, and Tom Verguts
Ghent University, Belgium
filip.vanopstal@ugent.be

A classical finding in numerical cognition is the distance effect in number comparison. This effect is not, however, limited to the number domain.
Therefore, it has been proposed that ordered non-numerical stimuli must be represented in a similar fashion as numbers, in the form of a mental number line (e.g., Dehaene, 2001). However, contrary to this view, we show that the distance effect can be dissociated from a more direct behavioral signature of mental number line access, the semantic priming effect. The implication is that the presence of a comparison distance effect does not imply a representation in the form of a number line. An interpretation of these findings is given in terms of a recently proposed model of quantity comparison (Verguts & Fias, 2004; Verguts, Fias, & Stevens, 2005).


**fMRI adaptation from symbolic magnitudes in parietal cortex**

Karolien Notebaert and Bert Reynvoet
Katholieke Universiteit Leuven, Belgium
karolien.notebaert@psv.kuleuven.be

The detection of number sensitive neurons in animals (Nieder & Miller, 2004) and the observation of fMRI adaptation to sets of items with a variable number in humans (Piazza et al., 2004) in parietal cortex led to important insights in the magnitude coding. In this study, we wanted to examine whether similar effects can be found when symbolic stimuli (i.e. digits and number words) are presented to the subjects. In an event-related design, a digit and a number word were presented sequentially and the numerical distance between both was manipulated. Subjects were instructed to respond as fast as possible when the second stimulus matched a predefined magnitude (number detection task). We found that in both hemispheres, parietal regions responded selectively to changes in numerical distance between both numbers of the stimulus pair. ROI-analyses showed that the activation was highest on trials where the distance was large (e.g. TWO-9) and decreased on trials where both numbers were close to each other (e.g. EIGHT-9) or where both numbers were the same (e.g. NINE-9). The results are in line with previous studies and suggest that the magnitude coding of symbolic stimuli is similar to that of non-symbolic stimuli.


**Symposium:** Attention and Control: How irrelevant information affects response selection and how control processes intervene

Sponsored by FWO-Flanders (WOG - Experimental psychology in relation to the cognitive neurosciences)
Organisers: Dr Wim Notebaert, Dr Kathleen Maetens, and Dr Eric Soetens

1. **Load and irrelevant information**

The role of perceptual load in visual awareness

Nilli Lavie  
University College London, UK  
n.lavie@ucl.ac.uk

Perceptual load theory suggests that whether irrelevant stimuli that subjects wish to ignore are nevertheless perceived and reach awareness depends on the level of perceptual load in a current task. Irrelevant distractors are perceived in tasks of low perceptual load despite subjects wish to ignore them. Irrelevant perception can be eliminated in tasks of high perceptual load that exhaust attentional capacity in processing task-relevant stimuli. Although there is much evidence for the theory (see Lavie, 2005 for review) this has typically been obtained with RT measures and neuroimaging and but these cannot support any direct conclusion regarding conscious or unconscious perception. In the present talk I describe new studies that examine the role of perceptual load in determining conscious as well as unconscious perception.


The role of working memory load in the activation of spatial numerical associations

Jean-Phillippe Van Dijck and Wim Fias  
Ghent University, Belgium  
jeanphilippe.vandijck@ugent.be

The mental representation of numerical magnitude is spatially organized. This is evidenced by 1) the SNARC effect (small numbers are preferably responded to with the left hand and large numbers with the right hand) and 2) by neglect patients showing a bias towards larger numbers when bisecting numerical intervals. Recently, Dorrichi et al. (2005) argued that a number bisection bias in neglect only occurs when the lesions extend from parietal to frontal cortex, thereby affecting visuospatial working memory. In the present research we investigate whether working memory resources are involved in the occurrence of the SNARC effect. For this purpose we designed an experiment in which we measure the SNARC effect during parity judgment (a task that does not require number magnitude). By preloading working memory with verbal or spatial information we can investigate if and how working memory resources have an impact on the processing of the irrelevant magnitude information and its spatial associations.
II. Sequential modulations of congruency effects

Modulation of the Simon Effect by Learned Incompatible S-R Associations

Robert W. Proctor\(^1\), Yanmin Zhang\(^1\), Motonori Yamaguchi\(^1\), and Kim-Phuong L. Vu\(^2\)
1. Purdue University, USA
2. California State University, Long Beach, USA
proctor@psych.purdue.edu

The Simon effect is shorter reaction time when stimulus and response locations correspond than when they do not for tasks in which stimulus location is irrelevant. When participants initially practice a spatial choice-reaction task with an incompatible mapping of stimulus locations to responses and then are transferred to a Simon task, the Simon effect is reversed to favor noncorresponding locations. This talk will describe research showing how transfer of the incompatible S-R associations varies as a function of the modes by which the spatial information is conveyed in the practice and transfer sessions. The influence of the mode relations on temporal and sequential modulation of the Simon effect will be examined as well.

Congruency modulations by repetitions of irrelevant stimulus information cannot be explained by one general attention-shift hypothesis

Peter Zeischka, Kathleen Maetens, and Eric Soetens
Vrije Universiteit Brussel, Belgium
Peter.Zeischka@vub.ac.be

Congruency effects are smaller when irrelevant information is repeated from one trial to another with short response-stimulus intervals (RSI) in a variety of conflict paradigms. This was demonstrated in Simon-tasks, by repeating irrelevant stimulus locations (Notebaert, Soetens, & Melis, 2001), in Stroop tasks, with irrelevant word repetitions, and in flanker tasks, with flanker repetitions (Notebaert & Soetens, 2006). These findings have been explained by a generalization of the attention shift hypothesis, stating that irrelevant information only withdraws attentional resources from task-relevant processing when the information changes. In flanker experiments with arrow stimuli we demonstrated that congruency modulations related to flanker repetitions were independent of other flanker changes. For example, changing flanker colour did not draw attention to the flanks. Control experiments revealed that the congruency modulation could not be replicated with nonspatial flanker stimuli, such as colour or geometrical shapes. At the same time we demonstrated that the repetition dependent congruency modulation is not the same as a similar effect found in Stroop-flanker tasks with long RSI (Morein-Zamir et al., 2002). Overall, the attention shift hypothesis is in need of a revision and does not apply to all repetition-dependent congruency modulations.


III. Conflict and error monitoring

Conflict adaptation exists but it does not always reduce conflict

Wim Notebaert and Tom Verguts
Ghent University, Belgium
wim.notebaert@ugent.be

Cognitive control adjusts information processing according to task-demands. An example is observed in congruency tasks where congruency effects are smaller after incongruent trials than after congruent trials. This is explained with adaptation after conflict was detected on incongruent trials (Botvinick et al., 2001). This could also be explained with feature repetition effects (Mayr et al., 2003). We present two paradigms for dissociating repetition from adaptation effects. Both indicate that conflict adaptation is observed when repetition effects are (experimentally or statistically) controlled for. In a second study, we focused on the control mechanism. Botvinick et al. proposed that task-demand units are adjusted so that relevant-information processing is enhanced and irrelevant-information processing suppressed. This control mechanism predicts task-specific adaptation, unless two tasks use the same relevant information. When two tasks use different relevant information, this control mechanism predicts larger congruency effects on Task A after an incongruent trial in Task B. Indeed, when participants switched between a Simon and a SNARC task with same relevant information (orientation) both congruency effects decreased after an incongruent trial in the other task. When both tasks used different relevant information (orientation and color), both congruency effects increased after an incongruent trial in the other task.


Drink alcohol and dim the lights: The impact of cognitive deficits on error monitoring

Nick Yeung
University of Oxford, UK
nicholas.yeung@psy.ox.ac.uk

Scalp EEG recordings indicate that regions in anterior cingulate cortex (ACC) are active following errors. Alcohol consumption has been found to reduce this error-related activity, leading to the suggestion that alcohol may directly disrupt the operation of an
error monitoring system located in ACC. However, it could also be that alcohol consumption affects ACC only indirectly, by impairing perceptual processing and thus making errors harder to detect. In my talk, I will discuss research that supports the latter interpretation. Using neural network models, we have shown that deficits in perceptual processing should have downstream effects on ACC function that are similar to empirically observed effect of alcohol consumption. These modeling results lead to a testable prediction: that degrading stimulus quality, to mimic an alcohol-induced perceptual deficit, should reduce error-related ACC activity. We have confirmed this prediction in subsequent EEG studies. These findings indicate the importance of considering monitoring and control mechanisms in the context of their interactions with ongoing task processes.

End of Symposium

Automatic statistical processing of visual properties in simultanagnosia

Nele Demeyere and Glyn Humphreys
University of Birmingham, UK
nxd370@bham.ac.uk

Previous research has suggested that when operating in a distributed attention mode, the visual system automatically represents visual displays by their overall statistics, rather than their individual properties. Recent neuropsychological work shows partly preserved estimation and distributed attention in simultanagnosic patients, who are typically defined by having an extremely small attentional window, causing them to be aware of only one object or part of an object at a time. This single-case study set out to investigate whether GK, a patient with Balint's syndrome, shows averaging of stimulus properties when trying to estimate the number of items present. We manipulated different stimulus properties in three experiments: colour shades, orientation and size. We found that for the manipulations of colour and size, when GK was in a distributed mode of attention, he (incorrectly) identified the mean object from 2 classes of exemplars more than in a control condition, when only 1 exemplar class was present. This demonstrates that visual statistical processing was operating. In contrast, in the orientation experiment, GK showed no difference between the control and the experimental conditions, possibly because of the distinct nature of the orientations used. Overall, this study reveals an automatic statistical processing of colour and size in simultanagnosia.

Estimating the probability of negative events

Adam Harris, Adam Corner, and Ulrike Hahn
Cardiff University, UK
harrisaj@cardiff.ac.uk

How well we are attuned to the statistics of our environment is a fundamental question in understanding human behaviour. It is particularly important to be able to provide accurate assessments of the probability with which negative events occur so as to guide rational choice of preventative actions. One question that arises here is whether or not our probability estimates for negative events are systematically biased by their severity (see, e.g. Slovic, 1966).
In a minimal experimental context involving an unambiguous, objective representation of probability we found that participants nevertheless judged an event as more likely to occur when its utility was extremely negative than when it was just moderately negative.


Confidence and reliability in causal learning

Marc J Buehner, York Hagmayer, Peter White, and Iain Hamlin
1. Cardiff University, UK
2. Universitaet Goettingen, Germany
BuehnerM@Cardiff.ac.uk

Results from previous investigations into human causal learning have often proven ambiguous because subjective impressions of causal strength are notoriously difficult to measure. One problem afflicting such studies is that causal ratings can conflate impressions of causal strength and confidence: a low rating on a scale could both indicate a strong belief that there is no causal relation, or a weak belief that there might be a relation. We conducted five experiments aimed to tease apart participants' subjective impression of data reliability (i.e. their confidence in the data) from their impressions of causal strength in a between subjects design, so that confidence could not impinge upon causal strength and vice versa. The explicit goal was to see whether reliability and strength are two separate psychological variables, or whether people process them in a unified way as suggested by Causal Bayes-Nets models of induction.

Bayesian updating and source reliability in psychological experiments

Adam Corner, Adam Harris and Ulrike Hahn
Cardiff University, UK
corneraj@cardiff.ac.uk

Applying the principles of Bayesian statistics to problems in cognitive psychology has become a popular theoretical approach in recent years. In the field of reasoning, Bayesian principles offer a normative and consistent method of updating subjective degrees of belief in a particular hypothesis (see, e.g. Oaksford & Chater, 1998). Whilst there have been promising developments in understanding human reasoning using the Bayesian approach, there are also a large number of results showing that people do not update their beliefs as rapidly as Bayesian theory would predict * that is, they are conservative with regard to Bayesian updating (e.g. Edwards, 1968). We present experimental results demonstrating that at least part of the explanation for these findings is the fact that participants know themselves to be in an experimental context. Specifically, they do not treat the experimenter or the experimental materials as fully reliable sources. In this case, however, a Bayesian perspective dictates that belief revision should be more conservative than if the source is fully reliable, as experimenters have traditionally assumed themselves to be.


Proportional reasoning as a heuristic-based process

Ellen Gillard¹, Wim Van Dooren¹, ², Walter Schaeken³, and Lieven Verschaffel¹
1. Centre for Instructional Psychology and Technology, University of Leuven, Belgium
2. Postdoctoral Fellow of the Research Foundation, Flanders
3. Experimental Psychology, University of Leuven, Belgium
Ellen.Gillard@ped.kuleuven.be

Research demonstrated that people often over-use proportional strategies (e.g., Van Dooren, De Bock, Hessels, Janssens, & Verschaffel, 2005). The present study interprets this phenomenon from a dual process framework (e.g., Evans & Over, 1996; Sloman, 1996; Stanovich & West, 2000). Current dual process theories claim that analytic operations involve time-consuming executive processing, whereas the heuristic system operates fast and automatically. Two experiments directly tested the claim that proportional reasoning is heuristic-based. Participants solved two types of problems. For the first type of problems, proportional strategies would provide a correct answer ("proportional problems"). The second type of problems was known to elicit proportional answers, but these would not be correct ("non-proportional problems"). In experiment 1 we experimentally manipulated the available solution time. In experiment 2, the executive resources were experimentally burdened with a concurrent attention demanding secondary task. As expected, both manipulations had a differential effect for proportional and non-proportional problems: For non-proportional problems, time constraint and working memory load led to an increase of proportional answers and a decrease of correct answers - whereas for proportional problems no significant effects were observed. This confirms our claim that proportional strategies rely on heuristic processing.


In two minds?: Conflict monitoring in dual process theories

Wim De Neys
University of Leuven, Belgium
Wim.Deneys@psy.kuleuven.be

Popular dual process theories have characterized human thinking as an interplay of an intuitive and analytic reasoning process. Although monitoring the output of the two systems for conflict is crucial to avoid decision making errors there are some widely different views on the efficiency of the process. Kahneman (2002) claims that the monitoring of the heuristic system is typically quite lax whereas others such as Sloman (1996) and Epstein (1994) claim it is flawless and people typically experience a struggle between what they "know" and "feel" in case of a conflict. The present study contrasted these views. Participants solved classic base rate neglect problems while thinking aloud. Verbal protocols showed no evidence for an explicitly experienced conflict. As Kahneman predicted, participants hardly ever mentioned the base rates and seemed to base their judgment exclusively on heuristic reasoning. However, more implicit measures of conflict detection based on participants' retrieval of the base rate information in an unannounced recall test showed that the base rates had been thoroughly processed. Results indicate that although the popular characterization of conflict detection as an actively experienced struggle needs to be revised there is nevertheless evidence for Epstein's basic claim about the flawless operation of the monitoring.


END OF MEETING
The effect of information frame on the accuracy of respiratory symptom perception in persons with Medically Unexplained Symptoms (MUS)

Katleen Bogaerts, An Millen, Wan Li, Steven De Peuter, Ilse Van Diest, Elke Vlemincx, Stien Fannes, and Omer Van den Bergh
University of Leuven, Belgium
katleen.bogaerts@psv.kuleuven.be

The effect of neutral versus symptom information frame was investigated on interoceptive accuracy (IA) and on retrospective symptom reporting in non-clinical high and low MUS reporters. Each of two trials (Rebreathing Test) consisted of a baseline (60 s), a rebreathing phase (150 s), and a recovery phase (150 s). The information frame was manipulated within subjects (order counterbalanced). In the neutral frame, participants were told that the gas mixture might alter breathing behavior and produce respiratory sensations. In the symptom frame, a possible induction of respiratory symptoms was announced. Breathing behavior was continuously monitored, subjective sensations were rated every 10s. After each trial, participants completed a symptom checklist. Within-subject correlations were calculated between the subjective rating and its physiological referent for the rebreathing resp. recovery phase of each trial separately. High MUS persons reported more retrospective complaints than low MUS persons, especially in the symptom trial. Only in the symptom trial, high MUS persons were less accurate than low MUS persons. The reduction in IA in high MUS persons was most striking in the recovery phase of the symptom trial. Results highlight the importance of the information frame and suggest a deficiency in symptom recovery in high MUS persons.

Compared time course of saccadic and attentional distractor effects for luminance and S-cone stimuli

Aline Bompas and Petroc Sumner
Cardiff University, UK
bompasa@cardiff.ac.uk

In contrast to the luminance pathway, the S-cone pathway does not project directly to the superior colliculus, believed to play a central role in saccade generation. Sumner et al. (2002) showed that S-cone stimuli could direct covert attention, inducing the attentional distractor effect, but did not produce the saccadic distractor effect. In the present study, we manipulated the time delay between the appearance of the distractor and the target for both effects. This study confirms that S-cone stimuli are able to produce the attentional distractor effect. However, contrary to previous findings, S-cone stimuli showed able to produce the saccadic distractor effect. Interestingly, while the distractor effect for luminance stimuli is on most subjects maximal for the 0-delay condition, the effect for S-cone stimuli is often maximal for delays varying from 0 to 60 ms depending on the subjects. This result is consistent with the assumed slowness of the S-cone pathway compared to the luminance pathway. Consequently, we do not confirm the previously reported dissociation between attention and gaze orienting. Further analyses will allow us to test predictions of the premotor theory of attention by comparing the amplitude of saccadic and attentional distractor effect.
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Fear conditioning: Unilateral damage to the amygdala disturbs conditioned skin conductance responses, leaving US expectancy learning intact

Evelien Coppens and Debora Vanstevenwegen
University of Leuven, Belgium
Evelien.Coppens@psy.kuleuven.be

Several lesion studies demonstrate that unilaterally amygdala-damaged patients show diminished skin conductance responses (SCRs) in reaction to aversively conditioned stimuli. Remarkable is that these patients still have correct knowledge regarding the CS-US association. Even though these data are consistent to what was previously observed in animal research, they challenge one of the main findings observed in human conditioning, namely that autonomic conditioning is closely associated to contingency awareness. We notice that in the lesion studies conducted so far, a post-conditioning measurement of awareness is utilised, which has been proven to be rather inadequate. In the current study a fear conditioning task is presented to a unilaterally amygdala-damaged patient group and a control group. Except for SCRs, US expectancy ratings were recorded, which are assumed to be a more appropriate reflection of CS-US awareness. Offering support for previously conducted lesion studies, results demonstrated that US expectancy learning occurred normally in the patient group, whereas skin conductance conditioning did not. Based on these findings we conclude that learning itself is not disturbed after amygdala damage. Furthermore, since unconditioned responses were preserved in the lesion group, amygdala damage appears to cause exclusively problems regarding the generation of conditioned autonomic responses.

The influence of gaze direction on awareness in recognition memory for faces

Noemy Daury and Serge Bredart
University of Liege, Belgium
noemy.daury@ulg.ac.be

Previous research demonstrated that faces displaying direct gaze elicited more hits than faces displaying averted gaze in an episodic recognition task. The aim of the present study was to assess further the effects of eye contact on person memory by evaluating whether the state of awareness that accompanied recognition was different for faces with eye gaze directed towards the observer as compared with faces looking elsewhere. We examined whether the subjective memory experience differ for these two kinds of faces by using the "Remember-Know" paradigm. If, as assumed in previous studies, direct gaze at encoding elicits deep processing of faces, then eye contact should enhance remembering responses. In the present study, participants performed a gender classification task at the encoding phase. To prevent gaze as a retrieval cue, faces were displayed with closed eyes in the recognition task during which participants judged whether a face had been seen previously, and reported the state of awareness associated with recognition.
Results indicated that the rates of Remember responses were indeed significantly higher for faces that showed direct gaze at encoding than for faces with deviated gaze. However, the rates of Know responses and Guess responses were similar for both kinds of faces.

**Negative priming in sequence learning**

Natacha Deroost, Inge Zeeuws and Eric Soetens  
Vrije Universiteit Brussel  
nderoost@vub.ac.be

We investigated negative priming (NP) in sequence learning, as demonstrated by Cock et al. (2002). The NP effect in sequence learning refers to the observation that Serial Reaction Time performance becomes impaired when participants respond to a sequence they were previously ignoring. In Experiment 1, we established a NP effect with a complex second-order conditional sequence structure. Experiment 2 showed that NP occurs even when the irrelevant sequence is not synchronized with the relevant sequence. However, the results of Experiment 3 demonstrated that NP was absent when participants did not concurrently respond to a relevant sequence, while being exposed to the irrelevant sequence. These findings indicate that NP extends over complex forms of sequence learning, but requires concurrent learning of a relevant sequence. We suggest that NP and the enhancement of (the expression of) learning of irrelevant sequences by concurrent learning of relevant sequences is guided by attentional processes.


**Reduced blocking is associated with the cognitive disorganisation dimension of schizotypy**

Lisa H. Evans and Mark Haselgrove  
Cardiff University, UK  
EvansLH@cardiff.ac.uk

It has been proposed that individuals with schizophrenia have difficulty in assessing the relevance of incoming information, a deficit which could give rise to some of their symptoms, such as thought disorder. In blocking (Kamin, 1968) prior learning about an A-outcome association hinders learning about B during subsequent AB-outcome trials. Previous research has suggested that individuals with schizophrenia show a deficit in blocking - perhaps due to their inability to assess B as an irrelevant stimulus. However, existing studies have been equivocal as to which symptom dimension is associated with this deficit. Due to the confounds present in testing individuals with schizophrenia (e.g. their lack of insight into symptoms, and the effects of antipsychotic medication) blocking was assessed in healthy volunteers using a human casual learning task, and schizotypy was measured using the O-LIFE (Mason et al., 1995). Schizotypy describes a participant's susceptibility to display some of the psychological characteristics of schizophrenia. Blocking was attenuated in participants high in the cognitive disorganisation dimension of schizotypy. No significant relationships were found with the positive or negative dimensions of schizotypy. The possible mechanisms supporting this finding are considered.


**Neural correlates of color category processing**

Elisabeth Fonteneau and Jules Davidoff
Goldsmiths College, University of London
e.fonteneau@gold.ac.uk

Previous research using behavioral techniques reveals that the sensory color continuum can be modified by category. Within-category stimuli (Green0-Green1) are harder to distinguish whereas between-category stimuli (Green0-Blue0) are easier even though their distances in color space are equal. We report the first evidence for the neurophysiological architecture of color categories. We compared event-related potentials (ERPs) elicited by physically identical colors (Green0) in three different contexts in an oddball paradigm while twenty participants performed an unrelated color task. Two of the contexts were different color categories (large distance: Green0-Red0 vs. small distance: Green0-Blue0) and the third context was different colors from the same category (Green0-Green1). Our results showed that deviant colors stimuli in all three different contexts elicited a positive deflection in the posterior regions - the change-related positivity - compared to standard stimuli. Both magnitude of color difference and category difference reduced the latencies of the change-related positivity. We conclude that the change-related positivity reflects color category as well as color deviancy processing. Moreover, category effects were not lateralised and suggest that, even if color categories are derived from the color terms of a speaker's language, the changes to color appearance have been effected at a site within visual cortex.

**Conflict monitoring in base rate neglect problems**

Samuel Franssens and Wim De Neys
Catholic University of Leuven, Belgium
samuel.franssens@student.kuleuven.be

A long standing debate concerns the reason why people frequently fail to solve classic reasoning tasks. Some authors claim that people do not detect a conflict between intuition and the logically correct response, and that they solely follow their intuition. Others argue that people notice that their intuitive response is logically inappropriate, but simply fail to suppress their intuition. In the present study participants solved classic base rate neglect problems in which the logical base rate information and the intuitive stereotypical description conflicted or not. Half of the participants reasoned under secondary task load. After a filler task, all participants had to answer questions about the description and base rate information of each of the problems.
As in previous work, results showed that information about the description and base rates was properly recalled for conflict problems. For no conflict problems this was not the case. This confirms the hypothesis that people detect the conflict and spend additional time processing the problem in case of a conflict. As expected, recall of the description deteriorated when participants had reasoned under load. However, recall of the base rate information was not affected by the memory load. This provides further evidence for the claim that conflict detection is always successful, and, contrary to popular belief, suggests that this analytic process operates automatically.

**Spatial bias in retrieval from VSTM following damage to left posterior ventral cortex**

Celine R. Gillebert¹ and Glyn W. Humphreys²
1. University of Leuven, Belgium
2. University of Birmingham, UK
celine.gillebert@student.kuleuven.be

We examined retrieval of coloured shapes from visual-short term memory (VSTM) in a patient (DM) with left medial and inferior occipito-temporal damage. DM showed a spatial bias in report from VSTM, being more accurate at reporting stimuli presented in her left than her right visual field. This spatial bias could not be attributed to a visual field deficit, it disappeared with a reduced number of stimuli and it did not depend on the length of the retention interval. The bias for items presented in her right field was based on the relative rather than the absolute locations of the stimuli and it was reversed when items moved from right to centre or left to centre, and DM was cued to report the item that would have been on the right or left, had the movement continued (i.e., now report was better for items that had actually appeared in the right field, relative to items that had actually appeared in the left field). We suggest that an attentional bias to the ipsilesional hemifield weakens the VSTM representations of stimuli presented in the contralesional visual hemifield, and selectively impairs VSTM retrieval.

**Categorical perception of animal patterns**

Julie Goldstein and Jules Davidoff
Goldsmiths, University of London, UK
j.goldstein@gold.ac.uk

As part of the more general issue of whether culture can affect perception, the present research addresses the Whorfian question of whether the language available to describe perceptual experience can influence the experience itself. It investigated the effect of vocabulary on perceptual classification by the study of a remote culture (Himba) which unlike its poor colour vocabulary has a rich vocabulary of animal pattern terms. The present study thus examined Categorical Perception with a type of stimulus not previously used to assess the effect of labels on perceptual judgements. For the animal patterns, the Whorfian view predicted that it would only be the Himba who showed superiority for cross-category decisions as only they have the appropriate labels. The Whorfian view was upheld and confirmed previous findings with colour that linked cognitive differences to labeling differences.
Interrupting problem solving: Colour cues facilitate task resumption

Helen M. Hodgetts, Phillip L. Morgan, and Dylan M. Jones
Cardiff University, UK
Hodgettshm@cardiff.ac.uk

Participants were unexpectedly interrupted (6 out of 25 trials) during the execution phase of 4-disc Tower of Hanoi (ToH) problems and required to complete a different 3-disc ToH before resuming the original task. The goal-activation model (Altmann & Trafton, 2002) predicts that efficient interruption recovery is dependent upon cues in the task environment boosting activation of the suspended goal, and task resumption will be slowed if these retrieval cues are removed. In Experiment 1, the four different-sized discs in the ToH were each different colours, but when the disc colours were rearranged following the interruption, task resumption times were increased compared to unaltered trials, presumably by impeding retrieval of the previously planned move. Task resumption times were reduced however, on trials in which the colours of discs on the primary task remained the same but those on the interrupting ToH task were rearranged (Experiment 2). When the disc colours on the interrupting ToH were incongruent with those on the main ToH, participants appeared to suffer less interference and were able to recover from the interruption more efficiently.


Belief and desire reasoning in patients with frontal lobe lesions: Evidence from novel non-verbal theory of mind tasks

Sarah Houthuys, Dana Samson, and Glyn W. Humphreys
University of Birmingham, UK
sxl558@bham.ac.uk

Beliefs and desires are two core mental states that enable us to predict and understand human behavior. Research in child development reveals that the understanding of desires is expressed earlier than the understanding of beliefs. Here, for the first time, we directly compared desire and belief reasoning in adults with acquired brain damage. We tested five patients who had previously been shown to fail false belief tasks. We used two novel non-verbal tasks: one where they were asked to infer the protagonist's belief and the other where they were asked to infer the protagonist's desire. In both tasks, on half of the trials (conflict condition), both the protagonist and patient had different perspectives (think or want something different). On the other half (no conflict condition), both parties had the same perspective (think or want the same). Two patients showed impaired reasoning for both mental states, while the three other patients were impaired in the belief reasoning task but not in the desire reasoning task. Thus desire reasoning tended to be spared even when belief reasoning was disrupted. We discuss the implications of our findings for the understanding of how beliefs and desires are processed in the adult mind and brain.
Attentional modulation of crowding: an equivalent noise approach

Christina J. Howard and Petroc Sumner
Cardiff University, UK
howardej@cardiff.ac.uk

Some have suggested that crowding occurs when attention binds features over an inappropriately large area (e.g. He, Cavanagh & Intriligator, 1996; Intriligator & Cavanagh, 2001; Tripathy & Cavanagh, 2002). Others have argued that crowding does not arise from a failure of attentional processes (e.g. Pelli, Palomares & Majaj, 2004) but at a lower-level locus such as summation by complex cells (Wilkinson, Wilson & Ellemberg, 1997). Dakin et al. (2006) used equivalent noise methods to show that the effect of attention is qualitatively different from that of crowding. Observers reported the overall orientation of six Gabor patches with and without crowding stimuli. High attentional load decreased the efficiency with which information was sampled from the stimuli, and crowding increased levels of internal noise. However, they used a dual-task paradigm to increase attentional load. In order to reduce cognitive load, observers may have adopted a strategy of attending to fewer stimuli, causing an apparent decrease in sampling efficiency. Instead, we here use attentional cueing to directly manipulate attentional direction to many or to few locations. Indeed directing spatial attention to fewer stimuli has previously been shown to increase precision of the representation of stimuli in VSTM studies (Wilken & Ma, 2004). The results are discussed in relation to the role of attention in crowding.


The cognitive superiority of bilinguals in metalinguistic awareness and executive functioning

Sandra Inurritegui and Géry d'Ydewalle
University of Leuven, Belgium
sandra.inurritegui@psy.kuleuven.be

Previous studies conducted by Bialystok provided evidence in favour of a bilingual processing superiority in both the linguistic and non-linguistic domains. It was hypothesized that bilingualism promotes the development of executive functions (including selective attention, inhibition of attention to misleading information and switching between competing alternatives) contributing to the control of activated languages. The purpose of the present study was to test the predictions of an enhanced processing control of bilinguals, in both metalinguistic and executive functioning. Dutch-speaking monolingual and bilingual children in second and fourth grade were assessed, using a grammaticality judgment task and 3 tasks measuring executive functioning (inhibition, switching, and updating). Ignoring distracting meaning in order to judge grammaticality was a greater challenge to monolingual than to bilingual children, providing support to the claim that bilingualism facilitates linguistic processing control. Although bilingual children in 4th grade responded more accurately in the inhibition task and showed less switch cost in the mental shift task, there were no evidence for a beneficial effect of bilingualism in the development of executive functioning. Factors affecting the relationship between bilingualism and cognitive control will be discussed.

Eyewitness confidence and accuracy in multiple line-ups

Michael B. Lewis
Cardiff University, UK
LewisMB@cf.ac.uk

The relationship between accuracy and self-rated confidence of eye-witness identification is now well established. This relationship, however, can be influenced by a variety of factors. The current experiment explored the effect of a previous line-up (looking for the same face and without feedback) has on accuracy and the accuracy-confidence relationship. Results show that previously seeing a target-absent line-up reduces accuracy in a subsequent target-present line-up. Further, those people who made an incorrect target-present response showed a reduction in confidence on the later target-present line-up. Finally, the accuracy-confidence correlation was not significantly affected by the previous target-absent line-up. In the conditions where the target-present line-up preceded the target-absent line-up, the accuracy-confidence relationship was considerably increased. The results are discussed in terms of the understanding the accuracy-confidence relationship and also the practicalities when multiple line-ups are employed forensically.
Working Memory Costs of Task Switching

Baptist Liefooghe¹, Pierre Barrouillet², Andre Vandierendonck¹, and Valerie Camos³
1. Ghent University, Belgium
2. University of Geneva, Switzerland
3. University of Burgundy, Dijon, France
baptist.liefooghe@ugent.be

Although many accounts of task switching emphasize the importance of working memory as a substantial source of the switch cost, there is a lack of evidence demonstrating that task switching actually places additional demands on working memory. The present study addressed this issue by implementing task switching in continuous complex span tasks with strictly controlled time parameters. A series of four experiments demonstrate that recall performance decreased as a function of the number of task switches and that the concurrent load of item maintenance had no influence on task switching. These results indicate that task switching induces a cost on working memory functioning. Implications for theories of task switching, working memory, and resource-sharing are addressed.

Simon and reversed Simon effects with an accessory peripheral signal in a go-nogo two-choice task

Kathleen Maetens, Peter Zeischka, and Eric Soetens
Vrije Universiteit Brussel, Belgium
kathleen.maetens@vub.ac.be

Although stimulus location is irrelevant in a Simon task, responses are faster and more accurate when stimulus and response location correspond. To investigate the temporal course of relevant and irrelevant stimulus activations, we presented stimulus identity and location at different points in time. Nogo trials were used to prevent anticipations. Relevant information was presented either 600ms before or together with the go or nogo signal. A peripheral accessory signal could appear either before, simultaneously with or after the go or nogo signal. When the relevant information was presented 600ms before the go signal and the accessory signal appeared shortly before or simultaneously with it, a Simon effect showed up. However, when the peripheral signal appeared shortly after the go signal, the Simon effect reversed, indicating interference of the irrelevant information with the event file, created before the go or nogo signal appeared. On the other hand, when relevant and go/nogo information were presented simultaneously the reversal disappeared and a positive Simon effect was found. These results seem to indicate that no stimulus-response binding can take place between colour and response location when first a decision has to be made whether a response is required.
The importance of serial order short-term memory mechanisms in lexical learning: further evidence from bilingual learners

Steve Majerus¹, Brendan Weekes², Martine Poncelet¹, and Martial Van der Linden¹,³
1. University of Liege, Belgium
2. University of Sussex, UK
3. University of Geneva, Switzerland
smajerus@ulg.ac.be

Previous studies have suggested a causal link between lexical learning and short-term memory (STM) capacity, especially STM for serial order information. However, other work indicates that the influence of STM capacity in lexical learning might actually depend upon the richness of the learner's phonological network. We explored this issue by examining the determinants of new word learning in participants with variable levels of English-French bilingual proficiency. The learning task was a word-nonword paired associate learning task, the nonwords obeying French phonotactic patterns. French phonological knowledge was estimated by productive and receptive vocabulary tasks and a composite French proficiency score summarizing quantitative and qualitative measures of French exposure and experience. STM measures were constructed to maximize retention of order information (serial reconstruction task) or retention of phonological item information (single nonword delayed repetition task). Serial order STM, but not item STM measures, strongly predicted performance on the paired associate learning task, and this was independent of French phonological knowledge which also predicted performance on the learning task to a lesser extent. The results support a causal role for serial order STM mechanisms in new word learning, and suggest that this is a general phenomenon applying to most contexts of lexical learning.

Auditory-semantic distraction at the interface of selective attention and semantic memory

John E. Marsh, Nick R. Perham, Robert, W. Hughes, and Dylan M. Jones
University of Cardiff, UK
marshje@cardiff.ac.uk

We report three experiments in which an auditory-semantic distraction effect is observed using a category fluency task (the generation of category-items when presented with a category cue e.g., "fruit"; Experiments 1 and 2) but not a phonemic fluency task (the generation of words beginning with a letter e.g., "f"; Experiment 3). In Experiment 1, category-exemplar generation was poorer in the presence of forward, as compared with reversed, speech suggesting that disruption was produced by the semantic, rather than acoustic, properties of the irrelevant sound. Experiment 2 revealed that this disruption was exacerbated by the semantic similarity between the target category and task-irrelevant material. Finally, Experiment 3 showed that this semantic effect does not act on general executive processing as there was no semantic effect on the phonemic fluency task which is known to make similar executive demands as category fluency but does not involve such extensive generation based on semantic cues. Results are interpreted as reflecting the cost of having to overcome the competition for action (e.g., retrieval processes involving semantic memory) between task-irrelevant and task-relevant items.
Unpredictability and context conditioning using a human conditioned suppression paradigm

Ann Meulders, Frank Baeyens, Debora Vansteennegen, Omer Van den Bergh, and Dirk Hermans
University of Leuven, Belgium
ann.meulders@psy.kuleuven.be

Pavlovian cue-conditioning has been extensively investigated as an experimental model for the development of fear. Analogously, context conditioning has recently been put forward as a possible mechanism in the aetiology of anxiety; nevertheless little research has been dedicated to this topic in humans. In animal literature, presenting unsignalled aversive USs is known as the most prominent way to install contextual fear. Typically, unpredictability induces contextual fear while predictability enhances conditioning to the CS. Grillon and Davis (1997) replicated these findings in human fear/anxiety conditioning using the startle modulation paradigm. We developed a series of experiments to investigate whether context conditioning could be observed using an instructed US (↔ biological significant US) in a computer game measuring conditioned suppression. Basically the design comprised two predictable and two unpredictable conditions respectively 1) the Paired and No-US condition and, 2) the Unpaired condition and US-only condition which were expected to result in differential involvement of context conditioning. Generally, more context conditioning was observed in unpredictable conditions than in predictable conditions, especially in the US-only condition. Moreover, conditioned suppression to the context was larger in the Unpaired compared to the Paired condition, while for suppression to the CS the reverse pattern emerged.


Semantic dominance in category fluency

Nick Perham, John E. Marsh, and Dylan M. Jones
Cardiff University, UK
perhnmr@cardiff.ac.uk

Effects of auditory distraction during retrieval from semantic memory were explored in a category fluency task. Participants were instructed to generate exemplars from presented categories whilst ignoring sequences of nouns presented over headphones. These to-be-ignored (TBI) items differed in their relatedness to the to-be-generated category (e.g., fruits) - being from either the same or a different (e.g., tools) category - and were either high (e.g., fruits: apple - tools: hammer) or low (e.g., fruits: kumquat - tools: dowel) in semantic dominance. Ignoring high-, compared to low-, dominant items impaired generation more but only when the items belonged to the same category as those being generated.
The findings are consistent with the view that the inhibition required to prevent irrelevant high-dominant-related items from being processed impairs the ability to access that same category from which to generate items. The overall pattern of results fits well with previous work on the retrieval-induced forgetting phenomena and more generally within a selection-for-action framework.

Concrete, process-focused processing reduces over-general memory in students

Filip Raes¹, J. Mark G. Williams², and Dirk Hermans¹

1. University of Leuven, Belgium
2. Department of Psychiatry, University of Oxford, UK

filip.raes@psv.kuleuven.be

Depressed people have a tendency to recall personal memories in an over-general rather than specific way. This phenomenon, called 'over-general memory', is a known vulnerability factor for depression (for a review, see: Williams et al. in press). One important underlying mechanism is rumination. For example, Watkins and colleagues (e.g., Watkins & Teasdale, 2001) showed that by reducing rumination, autobiographical memory retrieval becomes more specific. Hitherto, this has not been studied in non-clinical participants. The present experiment investigated the effect of rumination on memory specificity in 195 students. Participants repeatedly focused on scenario's in either a concrete, process-focused (or 'non-ruminative') mode or in an abstract, evaluative (or 'ruminative') mode (Moberly & Watkins, 2006) before filling out the SCEPT and FC-SCEPT, both measuring memory specificity. As predicted, participants trained into the non-ruminative mode retrieved less over-general memories and more specific memories than participants trained into the ruminative mode. The results add to the evidence that rumination is a crucial underlying process of over-general memory, and further extend this idea to non-clinical individuals.


The directionality of truth table tasks

Aline Sevenants, Walter Schroyens, Kristien Dieussaert, Walter Schaeken, and Géry d'Ydewalle
University of Leuven, Belgium
aline.sevenants@psy.kuleuven.be

Truth table tasks are a popular way to investigate the mental representation of conditionals. Two task formats are commonly used: the possibilities-task and the truth-task. Generally, in a truth table task, participants are asked to evaluate four logically possible cases produced by permuting the truth values of the antecedent and the consequent. In the possibilities-task, they have to indicate whether a case is either possible, impossible or irrelevant according to the rule. In the truth-task, participants have to evaluate whether the case makes the given rule either true, false or is irrelevant with respect to the truth of the rule. Although both task-types have a long research tradition, their difference in directionality (from rule to instance in the possibilities-task vs. from instance to rule in the truth-task) previously has never been taken into account. The experiment shows that the pattern of results is similar for both directions. This suggests that people make an abstraction of the exact formulation of rule and case, and rather use the same mental representation on both occasions.

How specific is perceptual learning of speech?

Michael A. Stevens¹, James M. McQueen², and Robert J. Hartsuiker¹
1. Ghent University, Ghent, Belgium
2. Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands
michael.stevens@ugent.be

When listening to speech, we must adapt to each talker's idiosyncratic realizations of phonemes. Part of this adaptation is achieved by a lexically-driven retuning of phoneme categories (Norris, McQueen & Cutler, 2003). The present experiments asked how stimulus-specific this perceptual learning effect is. Experiment 1 replicated the earlier study. Flemish listeners made lexical decisions to stimuli including 20 [s]-final and 20 [f]-final words. One group heard the same ambiguous phoneme (halfway between [s] and [f]) in all the [s]-words; a second group heard this sound in all the [f]-words. The first group subsequently categorized more sounds on an [s]-[f] continuum as [s] than the second group, confirming that listeners can retune phoneme categories using lexical knowledge. Experiment 2 was identical, except that a different ambiguous [s]-[f] sound was used in each lexical context during exposure. There was no difference in categorization between the groups. Other studies (e.g., Kraljic & Samuel, 2005) have shown, however, that lexical retuning can occur with exposure to a variety of ambiguous sounds. Thus, while there are conditions where lexical retuning emerges in response to a set of exposure phonemes, the present results show that it can also be specific to a single ambiguous sound.


The role of inhibition in memory updating

Arnaud Szmalec, André Vandierendonck, and Frederick Verbruggen
Ghent University, Belgium
arnd.szmalec@UGent.be

Memory updating is the act of modifying the current status of a representation in memory to accommodate new input. A predominant view is that memory updating is a distinct executive control process, which is functionally separable from other often postulated executive control processes (like mental shifting or inhibition). However, a number of researchers put forward that updating requires inhibition processes in order to dampen old memory traces, so that new information can be added. In the latter view, memory updating is not seen as a separable executive process, but rather as a task demand that requires inhibition. The purpose of the present study is to explore the inhibition hypothesis of memory updating by means of a number of experimental manipulations which estimate the involvement of inhibitory control in an n-back updating task. The results are discussed within current views on memory updating.

Integration of information across eye movements: The influence of background and target motion

Goedele Van Belle, Peter De Graef, and Karl Verfaillie
University of Leuven, Belgium
goedele.vanbelle@psy.kuleuven.be

The intake of visual information primarily occurs during fixations, alternated with saccadic eye movements. Previous experiments have shown that integration of information across fixations is more accurate for a translating, than for a stationary saccade target (Gysen, De Graef & Verfaillie, 2002). The present experiment was set up to replicate these findings and to investigate whether background presence and background motion influence this integration. For this purpose, a 3D environment was created consisting of a background of stationary or moving objects (translating to the left or to the right with a constant speed) and a stationary or translating saccade target object. At the start of the trial, subjects had to fixate a fixation cross in the middle of the screen. After a cue, subjects made a saccade towards the target object. During this saccade, the target object could be displaced horizontally. The subject had to indicate whether a displacement occurred or not. Displacement size was manipulated. We compared the accuracy with which subjects could detect the intrasaccadic displacement in different motion and background manipulations. We also investigated the influence of saccadic latencies on detection accuracy, in view of the possible importance of preprocessing the moving scene prior to saccade execution.
Automatic goal inferences: Are direct and hidden goals alike?

Marijke Van Duynslaeger, Bert Timmermans, and Frank Van Overwalle
Vrije Universiteit Brussel, Belgium
Marijke.Van.Duynslaeger@vub.ac.be

This study examines automatic inferences of direct and hidden goals. In three experiments, we used a probe recognition paradigm with deadline procedure, and imposed respectively a 300 ms, 650 ms and 1000 ms deadline for responding. If goals are inferred automatically after reading goal-implying sentences, then participants should more often falsely recognize the implied goal as part of the sentence in comparison with control sentences. We found that direct goals are inferred under all time windows, while hidden goals are only inferred under a 1000 ms deadline. These results confirm that direct goals as well as hidden goals are inferred spontaneously. However, only direct goals are inferred automatically.

Return of experimentally induced chocolate craving after extinction: Divergence between craving and US-expectancy

Dinska Van Gucht, Debora Vansteenwegen, and Omer Van den Bergh
University of Leuven, Belgium
dinska.vangucht@psy.kuleuven.be

Hitherto, little attention has been devoted to renewal in appetitive conditioning -in contrast to renewal in the fear domain- even though translating findings could potentially help improve extinction-based addiction treatments (Bouton, 2000). Therefore, we developed a paradigm to investigate acquisition, extinction, and context change effects in conditioned chocolate craving (using an ABA-renewal design). In Studies 1 and 2 we successfully demonstrated differential acquisition, but we found that acquired craving was context-specific, unlike what is commonly observed in, for instance, fear conditioning studies. Although research on conditioned fear is a source of inspiration when looking at renewal in appetitive conditioning, an important difference between fear and craving may be that craving presumably is less closely tied to US-expectancy than fear is. In accordance with this, we separately assessed craving and US-expectancy in a between-subjects design (n = 64) in Study 3. Results showed that the US-expectancy data were in line with results from fear studies, in that differential acquisition, extinction and renewal were observed in the ABA-group. The craving data did not follow this pattern, indicating a different relationship between fear and US-expectancy than between craving and US-expectancy.


Attitude accessibility as a moderator of correspondence between implicit and explicit self-esteem

Heleen Vandromme, Adriaan Spruyt, and Dirk Hermans
University of Leuven, Belgium
Heleen.Vandromme@psy.kuleuven.be

Currently, attitude accessibility and attitude strength in general receive considerable attention within attitude literature. Fazio (1995) defined attitude accessibility as the likelihood that an attitude will be activated automatically from memory when encountering an object. Only when an attitude is stored in memory, encountering information about this attitude will lead to its automatic activation. When no firmly established attitude concerning one's self-concept exists, however, the size of the APE is meaningless, since no representation in memory exists that can be activated automatically throughout prime presentation. This experiment aimed to study whether the extent to which the attitude towards the self-concept is accessible in memory, would influence correspondence between implicit and explicit measures. We hypothesized that the correlation between implicit and explicit measures would be stronger when attitude accessibility is high. The present study (N = 162) first measured attitude accessibility towards the self-concept, following Fazio (1984). Next, an evaluative priming task and a lexical decision task were performed. Only for participants who demonstrated an easily accessible self-concept, a significant correlation was found between the explicit measure of self-esteem (RSES) and the size of the affective priming effect as a measure of implicit self-esteem, r(48) = .37, p < .01.

The effect of stress and relief on sigh behaviour

Elke Vlemincx, Ilse Van Diest, Steven De Peuter, Stien Fannes, Katleen Bogaerts, Wan Li, Johan Bresseleers, and Omer Van den Bergh
University of Leuven, Belgium
elke.vlemincx@psy.kuleuven.be

Little is known about the psychological triggers of sighing. Paradoxically, some literature considers sighing as a marker of stress, whereas others regard sighing as an index of relief. In a previous experiment we found that feelings of tension and increases in feelings of relief could predict sighing. The present study aimed to find out whether more sighing occurs during periods of increased relief following a stress period compared to relief situations that are not preceded by stress and stress situations. Participants (N=41) were subjected to 60 successive trials, consisting of a cue phase (10s) followed by a stressor phase (10s). During the cue phase either a danger or a safety signal was presented. During the stressor phase the danger signal was followed by a noise stressor, whereas the safety signal preceded a period of silence. Breathing was recorded continuously. Results show more sighs during safety conditions following a stressor, compared to conditions of safety after no stressor, danger after no stressor and danger after a stressor. This result indicates that sighs can be triggered by increased relief after stress. Future studies could examine to which extent this effect is mediated by preceding breathing behavior.
Narrowing down the conditions of extinction of Pavlovian feature positive discriminations

Priya van Vooren, Tom Beckers, and Frank Baeyens
University of Leuven, Belgium
priya.vanVooren@psy.kuleuven.be

Several studies on extinction of occasion setting in humans have revealed that mere, non-reinforced presentations of an occasion setter X are not enough to abolish a previously acquired X-->A+;A- discrimination whereas X-->A- presentations are (Baeyens et al., 2001; 2005). Therefore, it seems essential to include stimulus A in the extinction procedure. However, Rescorla (1986) showed that in rats, extinction of modulation can also be achieved by sequentially presenting X with a separately trained excitor under non-reinforcement (X-->B-). These findings were never further investigated. The aim of the present study is to determine the effect of X-->B-presentations on an acquired X-->A+;A- discrimination in humans. In addition, we want to examine under which other circumstances a modulator may lose its power. Thus, after X-->A+;A- training, we look at the effect of non-reinforced presentations of feature X in conjunction with either a neutral stimulus (B0), an excitor (B+), or a target stimulus that has been subject to modulation by another feature (Y-->B+;B-) or by the same feature (X-->B+;B-). We will discuss the preliminary results and review the implications of our findings for different theoretical models of occasion setting.


The retention of conceptual, but not perceptual aspects of content information is affected by d-ampheta

Inge Zeeuws, Natacha Deroost, and Eric Soetens
Vrije Universiteit, Brussel, Belgium
inge.zeeuws@vub.ac.be

Previous findings demonstrated an improved long-term retention of episodic memory after an acute administration of d-amphetamine. The purpose of the present study is to unravel whether the drug specifically affects the retention of perceptual (surface-level stimulus features) or conceptual (meaning/semantic) aspects.
In a double blind, placebo controlled study participants had to study a list of objects for a later unspecified test. A 3-alternative forced choice task was used on four subsequent tests in which the nature of the target and the distractors was manipulated. In one condition participants had to make a decision primarily based on conceptual information (target = same meaning, different shape; distractors = different meaning), whereas in the other condition they could only use perceptual information (target = identical object; distractors = same meaning, different shape). The results show more forgetting in the conceptual condition relative to the perceptual condition. A positive effect of d-amphetamine was found when subjects could rely on conceptual information, but no effect of the drug was found when participants could only use perceptual information. The present findings indicate that d-amphetamine does not affect the retention of all aspects of content information, but specifically improves the retention of conceptual information.
Hotels and Guest Houses close to campus

Cardiff has many hotels and guest houses near the University, ranging in expense (http://www.visitcardiff.com/ provides an extensive list). City centre hotels are within walking distance of the School of Psychology as are the many guest houses and hotels on Cathedral Road. Note that early booking is strongly recommended.

Travel

For information on directions and maps, you are invited to consult: http://www.cardiff.ac.uk
For details, select “information for visitors” and then “locations and maps”. Note that the School of Psychology is located in the Tower Building. This is on Park Place and is part of the Cathays Park Campus.

By Air

Cardiff International Airport (http://www.cwlfly.com/) is 11 miles from the city centre.

In addition, National Express (Enquiries Tel: 08705 808080) and various rail companies (Enquiries tel: 08457 484950) operate direct services to Cardiff Central Station from London's Heathrow and Gatwick airports.

By Rail or Coach

The main public transport hub for Cardiff is Cardiff Central Station. Both intercity trains and busses arrive here.

From Cardiff Central Station there is a frequent train service which stops at Cathays Station, located on the near to the School of Psychology (Enquiries: 08457 484950). There are also bus services: the No 27 service leaves from stand D3 in front of Cardiff Central Station, and the No 53 service leaves from nearby Westgate Street (Enquiries: 0870 6082608). The university map shows the location of the Central Station relative to the School of Psychology.

By Car

Cardiff is served by the M4 and is easily accessible from all parts of Britain.

From the south west, take the M5 and from the south of England, follow major A roads to the M4.
From Scotland, the north of England and the Midlands, travel via the M50 to the M4.

Travelling east on the M4. Leave the motorway at Junction 32, follow the A470, signposted City Centre, into the Cathays area of the city.
Travelling west on the M4. Leave the motorway at Junction 29, follow the A48(M)/A48, signposted Cardiff East and South, to the A470. Follow the A470, signposted City Centre, into the Cathays area of the city.

**Parking**

Car parking in University car parks is extremely limited and a permit is required. However, there are some short and long stay public car parks located close to the University, all of which are marked on the University and City Centre map.

There is also car parking available within the civic centre (along College Road, City Hall Road, King Edward VII Avenue and Museum Avenue) where a voucher system operates. Vouchers are available from local shops the University Union Shop, Bute Building Reception, Park Place Fitness and Racquets Centre, and the National Museum and Gallery of Wales

**Local Taxis**

There is a taxi rank at Cardiff Central Station (the journey to the Tower Building, School of Psychology normally takes about five minutes outside rush hour).

**Eating and Drinking**

**Lunch:**

There are some café facilities located in the Cybercafe on the ground floor of the Tower Building, as well as cafés located close to the Tower Building on Cathays Terrace and Senghennydd Road. In addition, Incognito’s (on Park Place between the School of Psychology and the city centre) and the Pen and Wig (on Park Grove, directly behind Incognito’s) are popular lunch-venues if something more substantial is required.

**Evening meals: Restaurants in Cardiff**

The closest restaurant (and a personal favourite of the local organiser) to the School of Psychology is the Armless Dragon (97 Wyeverne Road, 029 2038 2357). There are also a number of restaurants in the City Centre, with a particular concentration in the city centre’s new Brewery Quarter (off St Mary’s Street). Further afield (10 minutes by taxi), Mermaid Quay in Cardiff Bay hosts a number of waterfront bars and restaurants.

**Conference Dinner**

This will be held at the Aberdare Hall, on Corbett Road (which is adjacent to the School of Psychology) on the evening of 11th April. The cost for three courses including wine will be £27.00. Please book, and indicate any dietary requirements, on the enclosed form which should be returned to “Dr Dominic Dwyer, EPS Meeting, School of Psychology, Cardiff University, Tower Building, Park Place, Cardiff, CF10 3AT” before 16th March 2007.