



Welcome to the end of academic year Newsletter of the Centre for Developmental Cognitive Neuroscience (CDCN). We hope you will find it useful. If you would like to contribute to this monthly newsletter, for example by providing information about events, research projects or any other news about developmental cognitive neuroscience, please contact cdcن@ucl.ac.uk

Report on monthly CDCN Wednesday Seminars for the Year:

The CDCN seminar speakers for the year were:

Autumn 2011:

- September 14th *Dr Iroise Dumontheil*, Institute of Cognitive Neuroscience, UCL
- October 12th *Professor Narinder Kapur*, Southampton University
- November 9th *Dr Jess Nithianantharajah*, Sanger Institute, University of Cambridge
- December 14th *Anna Simmonds*, Clinical Sciences Centre, Imperial College London (**Chair: Torsten Baldeweg**)

Spring 2012:

- January 11th *Dr Daniela Montaldi*, University of Manchester
(**Chair: Faraneh Vargha-Khadem**)
- February 15th *Professor Brian Butterworth*, Institute of Cognitive Neuroscience, UCL
(**Chair: Torsten Baldeweg**)
- March 14th *Dr Fred Dick, Senior Lecturer*, Department of Psychological Sciences, Birkbeck
(**Chair: Frédérique Liégeois**)
- April 18th *Professor Vicki Anderson*, University of Melbourne
(**Chair: Faraneh Vargha-Khadem**)

Summer 2012:

- May 9th *Dr Mairéad MacSweeney*, Institute of Cognitive Neuroscience, UCL
(**Chair: Bencie Woll**)
- June 13th *Dr Courtenay Norbury*, Royal Holloway
(**Chair: John Wattam-Bell**)
- July 11th *Dr Victoria Southgate*, School of Psychology, Birkbeck
(**Chair: Francesca Cacucci**)

Report on Workshops in the Academic Year

Autumn Workshop:

“The Emerging Social Brain” – 6 October 2011

This Workshop featured presentations by five leaders in the field:

Professor Murray, who is based at the School of Psychology and Clinical Language Sciences at Reading University.

Professor Fearon, is one of the heads of the Anna Freud Centre-UCL Developmental Neuroscience Unit.

Professor Moore, is based at the University of East London and is the current Director of the Institute of Research for Child Development.

Professor Mark Johnson, is the current Director of the CBCD and has worked extensively over the past two decades on the mechanisms driving typical and atypical development.

Professor Csibra, heads the department of Cognitive Science in the Central European University based in Budapest.

Breakdown Summary of Workshop Registration as follows:

Total number of attendees: 171

Number Registered: 269

Number “No show”: 98

Spring/Summer Workshop:

“The Rise and Fall of Memory across the Lifespan” – 15 May 2012

Video and Live Streaming:

This was the first time for the CDCN where we were able to invest in the live streaming service and video recording of the lectures. For those speakers who gave permission (4 out of 5), these videos have now been edited and are publicly available.

Short synopses of the content of the lectures follow the list of speakers below.

The link to view the individual videos for those who gave kind permission as listed below is:
<http://www.ucl.ac.uk/cden/videos>

- **Professor Carol Barnes:** Regents Professor of Psychology and Neurology; Evelyn F McKnight Chair for Learning & Memory in Aging; Director, Evelyn F McKnight Brain Institute, University of Arizona, USA: *“Temporal Lobe correlates of Memory Decline in Normal Ageing”*
- **Professor Neil Burgess:** Professor of Cognitive & Computational Neuroscience, UCL Institute of Cognitive Neuroscience, Queen’s Square: *“Spatial memory: neural mechanisms, development and amnesia”*
- **Professor Alan Baddeley:** Department of Psychology, University of York: *“Memory: A life-span oriented overview”*
- **Professor Nicola Clayton:** Professor of Comparative Cognition, Department of Experimental Psychology, University of Cambridge: *“Mental Time Travel: From Crows to Children and Back Again”*

Short Summaries of the Talks:

Professor Carol Barnes: *“Temporal lobe correlates of memory decline in normal ageing”*
(Rapporteur: Louise Croft, PhD Student, Developmental Cognitive Neuroscience Unit, ICH)

Professor Carol Barnes discussed her work investigating altered function of the hippocampus and spatial representations during the ageing process, across species. In ageing mice, alterations in CA1 and CA3 pyramidal cell functioning was associated with disrupted re-mapping of spatial representations in new contexts. These findings can be explained by a novelty discrimination impairment in ageing mice, which also occurs following focal lesion to the perirhinal cortex. The ageing mice cannot distinguish between familiar and novel items. As such, Professor Barnes suggested input from the perirhinal cortex to the hippocampus, via the entorhinal cortex, may be altered in ageing populations, impairing novelty discrimination and thus, spatial memory performance.

Professor Alan Baddeley: *“Memory: A life span oriented overview”*
(Rapporteur: Georgia Pitts, PhD Student, Developmental Cognitive Neuroscience Unit, ICH)

Professor Baddeley gave vignettes of studies through which he and his colleague Graham Hitch devised their tripartite model of Working Memory. Support for this model has been provided by studies of children with Specific Language Impairment. Professor Baddeley stressed the importance of Working Memory and how it can be trained and improved, emphasising Susan Gathercole’s work on predicting scholastic performance from working memory capacity. Emphasis was also placed on episodic memory, and the vulnerability of this aspect of memory to ageing- particularly the process of recollection. He and colleagues formulated the Doors and People test, which has provided evidence for the direct comparison between recollection and familiarity processes being reliant on different parts of the medial temporal lobe system.

Professor Kim Graham: *“Blurring the boundaries between memory and perception: neuropsychological and neuroimaging evidence”*
(Rapporteur: Zita Patai, Research Associate, Developmental Cognitive Neuroscience Unit, ICH)

It is undisputed that damage to the medial temporal lobe (MTL) leads to memory impairment mainly of consciously accessible memories, with a selective sparing of motor learning, priming, conditioning, working-memory, and short-term memory functions. However, in addition to the classic hypothesis that the MTL is mainly involved in memory, it has recently been shown, in both humans and non-human primates, that the MTL may also have an important function in perception (for reviews see, *Graham, Barense, & Lee, 2010; Murray, Bussey, & Saksida, 2007*). According to the ‘representational’ account of MTL function, the hippocampus is involved in the processing of complex scene stimuli, while the perirhinal cortex is involved in the processing of complex objects, independent of a memory component. These areas seem to become involved in a task if the perceptual input is ambiguous and leads to the alternative conclusion that the degree of MTL involvement in a task depends more on the representation demands of the task (how complex it is), as opposed to the cognitive domain tested (memory or perception).

Professor Neil Burgess: *“Spatial memory: neural mechanisms, development and amnesia”* (Rapporteur: Zita Patai, Research Associate, Developmental Cognitive Neuroscience Unit, ICH)

There are multiple parallel representations of space in the medial temporal lobe (MTL), and therefore multiple parallel representations of space in memory. In the hippocampus there are cells that fire when the animal is at a specific location in the environment (‘place cells’) (*O’Keefe & Dostrovsky, 1971*) and others which fire in relation to boundaries or edges in the environment (‘boundary vector cells’) (*O’Keefe & Burgess, 1996*), while cells in the entorhinal cortex (EC) fire in clusters at certain points in the environment, forming a regular, grid-like pattern (‘grid cells’) (*Hafting, Fyhn, Molden, Moser, & Moser, 2005*). As such, the hippocampus codes for relations in the environment, which is needed for allocentric processing, while the EC represents movement-related information needed for path integration or egocentric processing. These two systems of representations interact and allow for the formation of new spatial representations and memories in new environments. In humans, the interaction between these systems emerges around 3 years of age, when children begin to understand environmental, or allocentric cues, a similar age when humans begin to develop episodic, rich contextually detailed, memories.

Professor Nicola Clayton: “*Mental Time-Travel: From Crows to Children and Back Again*”
(Rapporteur: David Nobbs, PhD Student, Developmental Cognitive Neuroscience Unit, ICH)

Episodic memory not only allows humans to recall past experiences, but also to imagine future events, which is an intrinsic component of human behaviour and thought. However, do non-human animals dissociate themselves from their current needs and motivations and plan for the future, beyond reinforcement learning, or is this ability unique to humans, representing a discontinuity between us and other animals? At what age does this ability develop in humans? These questions were addressed in a series of experiments. It was found that crows were able to anticipate hunger and plan by storing food in a useful location. In contrast, children of age three were unable to anticipate future needs. Children of age five performed much better, whilst children at the age of four found a question about their future needs harder to answer than a similar question posed about another child.

Disability Provision:

Rapporteur: Esther Huntbach, CDCN Administrator

This Workshop accommodated two British Sign Language interpreters. This was the first time that we were able to make such provision for one or two attendees and much was learned from this experience in terms of better provision and the preparation required not only from the individual speakers but also from the in-depth information required by the BSL interpreters.

Total number of attendees: 129

Number Registered: 184

Number “No show”: 55

Number on Waiting List: 46

Average Rating for the Workshop:

- How would you rate the overall usefulness of attending this Workshop? On a scale of 1 (poor) – 5 (excellent): **4.2**
- Please let us know if you have any suggestions for future Workshop topics? **Mental capability changes from a lifespan perspective; Psychotic Diseases; Language orientated; Development of Psychiatric Disorders; Neuroendocrinology, other hormones and their impact on cognitive processes; Affective Neuroscience; Neurodevelopmental disorders; Epilepsy in Children; Sleep; Memory consolidation**
- Please let us know how you think the CDCN can help you: **Organise Poster & Awards in a 1-2 day Workshop including Early Career Researcher Prizes; Potential future collaborations - we work on the cellular neurophysiology of hippocampal neurons at early developmental stages and during normal ageing; Have a "socialising"/ networking event; Have similar Workshops which will introduce us to other broad topics**
- Any other comments? **These workshops are brilliant - they are stimulating and inspiring.**

CDCN Progress in 2011-12:

Summer Workshop 2012:

- “*The Epilepsies: Animal Models and their relevance to Childhood and Adult Epileptic Syndromes*” has been postponed to the next academic year in view of the date of the Memory Workshop in May and also the Olympics.

CDCN Publicity and increasing awareness:

- CDCN Flyers were distributed with the packs at the Workshop in May. Furthermore, approximately 850 of these flyers were distributed at the Neuroscience Symposium on 29 June 2012.

Website Update:

- Please do visit the newly re-designed CDCN Website (which is still a work in progress). The following have been added to the website:
- Twitter Feed on the Home Page and other significant pieces of information: <http://www.ucl.ac.uk/cdcn>
- External and General Short Courses: <http://www.ucl.ac.uk/cdcn/training>
- 3rd Paediatric Neuropsychology Symposium – Free lectures for the public from Professors Faraneh Vargha-Khadem and Jan Atkinson; also other information etc: <http://www.ucl.ac.uk/cdcn/videos>
- See under ‘Events’ for latest Seminars; Workshops; Symposia; Lectures: <http://www.ucl.ac.uk/cdcn/events>
- See under ‘News, Press and Media’ for CDCN members’ activities, such as media interviews <http://www.ucl.ac.uk/cdcn/news>

Public Service Review Article:

- The article written by Professors David Gadian and Vargha-Khadem on behalf of the Steering Committee of the CDCN was published in Issue 5 of UK Science & Technology (Public Service Review): <http://www.ucl.ac.uk/cdcn/aboutus>

Plans for the Autumn Term:

- *Autumn Seminar Series are now nearly all in place:*

September 12th: *Speaker TBC*

October 10th: *Professor Bencie Woll, Director, Deafness Cognition and Language Research Centre, UCL*
“Developmental Disorders in Sign Language: insights into modality and language impairment”

November 14th: *Professor Tony Charman, Chair in Autism Education, Department of Psychology & Human Development, Institute of Education*
“Establishing the Cognitive Phenotype of ASD”

December 12th: *Professor Charles Hulme, Professor of Psychology, UCL*
“Causal models of children’s reading and language disorders”

We wish you relaxing and enjoyable summer break and look forward to seeing as many of you as possible at our events in the new academic year.

For more information about CDCN or any of the information in this newsletter visit www.ucl.ac.uk/cdcn

Please let us know how we can facilitate your research, education, collaborations or grant bids and tell us your key news:

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