UK Minister Follows up on Recent CCACE Publication

On a recent visit to Edinburgh, the Rt Hon. David Willetts MP - the UK Minister for Universities and Science - met with CCACE Director Prof Ian Deary to discuss a publication from the Centre on the genetics of intelligence in ageing. The paper describes the genetic contribution to stability and change in intelligence across the lifespan appeared in Nature last month and generated some press interest. After the private meeting which lasted 30 min, Mr Willetts said of the Nature paper, “This is an illuminating study; ingenious in the way it drew on the database; and fascinating in showing that a quarter of the change in intelligence across the lifespan is explained by genetic factors.”

Mr Willetts and Prof Deary discussed the Lothian Birth Cohort (LBC) studies, and studies on genetic and lifestyle contributions to cognitive ageing. The Minister also quizzed Ian about the Flynn effect on intelligence, how there are influences on cognitive abilities across the life course, and the importance of studying the early stages of human cognitive ageing in our ageing society, an issue of clear importance to the Minister. Prof Deary said of the meeting, “Mr Willetts was very interested in the influences on cognitive function from conception to old age. It was a very good opportunity to describe the LBC/Disconnected Mind and CCACE research to a policy making Minister. I don’t think many Ministers could talk in so much detail about the Flynn effect!”

A video of Professor Deary describing the work is available on the CCACE YouTube Channel at http://youtu.be/hCKXDzX1na0.

Deary et al. (2012). Genetic contributions to stability and change in intelligence from childhood to old age. Nature doi:10.1038/nature10781

http://dx.doi.org/10.1038/nature10781
Standards for Determining the Vascular Contribution to Neurodegeneration

A worldwide collaboration focusing on vascular imaging anomalies met in Edinburgh to start discussions on standardising the terminology used to describe these anomalies.

Neurodegeneration during ageing is commonly associated with vascular abnormalities. However the terminology and definitions used to describe these common vascular imaging abnormalities varies widely.

The collaboration (below) consists of 22 likeminded academics from France, Germany, Canada, Austria, Italy, Australia, United States & the UK. It met in Edinburgh for a 3 day focused meeting to start the discussion on how to bring these definitions together in a more cohesive manner.

The work is funded through the Centres of Excellence in Neurodegeneration (CoEN) program set up by the MRC, DZNE, CIHR, and other national funding agencies worldwide.

After a rather informative and productive meeting the work can now start in earnest, a further meeting will be held in November and the results published in January 2013. The project and meeting received some attention in the Lancet Neurology in April 2012 (Vol 11, p293). www.thelancet.com/neurology.

CCACE PhD Student News

CCACE's ever-growing cohort of centre-funded students welcomed 3 new additions at the start of this academic year. A warm welcome to Nicola Wheelan who began her work with the Stress, Hormones and Cognitive Ageing group, and to Laura Flett and Stephen Rhodes who are both in the Master's year of their 3+1 studentships.

This November saw a large contingent of CCACE staff and students travel to Newcastle for the second Lifelong Health and Wellbeing (LLHW) meeting. This two-day conference brought together researchers from the 5 large centres funded by the LLHW initiative, which aims to promote cutting-edge research into various aspects of ageing. The first day was entirely given over to the PhD students from each centre, and we had the opportunity to showcase our own research and discuss the work of others, which ranged from movement rehabilitation to microbiology and even included the invention of a portable stroke-detecting helmet.

There was also the opportunity to get to know everyone better during the evening meal and pub quiz (in which CCACE teams placed an admirable 1st and 2nd!), and the conference concluded the next day following presentations by the directors of each of the 5 centres. It left us with a real sense of the scope and quality of research being produced at all levels by those funded by the LLHW initiative.

Simon Cox, PhD Co-ordinator
In this first profile of CCACE members we speak to Dr Susan Shenkin, clinical senior lecturer in Geriatric Medicine at the University of Edinburgh and honorary consultant with NHS Lothian. Her research focuses on lifecourse influences on cognitive ability and cerebrovascular disease, using birth records from 1921 and 1936 to assess the influence of early life events.

In her clinical role Susan looks after older patients in Liberton Hospital undergoing rehabilitation, and day hospital patients, many of whom have some form of cognitive impairment. On the research side, she aims to develop a better understanding of how early life influences cognition in older age and on vascular cognitive impairment in particular. She hopes to be able to use lifecourse information to improve the health and care of older people, through the application of this knowledge in public health interventions throughout life (even before birth) to predict and prevent later cognitive decline.

“As a clinician, a lot of motivation comes from seeing the huge variation in the patients. In a clinical context, we see a lot of older people at the frail, impaired end of the spectrum. After a weekend on call, you sometimes need to go onto Princes St and just watch the healthy older people to remember that they’re out there!”

Susan did a medical degree with an intercalated BSc in psychology at Edinburgh “[this] opened my eyes to the fact that [in psychology] you’re allowed to think – in medical school you are told what’s true and regurgitate it on paper... Actually forming your own opinion was quite an eye-opener for me... But I might never have finally found research if I hadn’t applied for the wrong job!” One interviewer suggested she might consider a research role, and a meeting with Jonathan Seckl steered her towards her future supervisors. “John [Starr] knew just the project for a geriatrician with a psychology BSc... The LBC1921 study was just getting started, they already had childhood IQ scores and the idea to follow-up later in life, but no-one had investigated the importance of influences before the age of 11.” Susan’s interests lie beyond immediate effects on cognition on a single age group - “Studies that look at one timepoint are important, but the impact they have might be influenced by stuff that’s happened already. You’ve got to look across the entire lifecourse.”

To examine the influence of early life events, Susan worked with others to track down the birth records for LBC1921 participants “I learnt a lot about birth records, and linking names to databases, which adds the historical context of the early life of the cohorts”. Susan is now working on tracking down birth records from LBC1936 participants, and further afield: “Hopefully, we’ll also be able to get birth records for Lanarkshire and Aberdeen to compare with the Edinburgh data and investigate the effects of differences in socio-economic status. With the LBC1921 and LBC1936 IQ and health data, this would allow us to investigate whether lifecourse influences are different in different environments”.

Susan found when her own “lifecourse events” gave her pause to reflect - “It was bizarre being pregnant and looking at data seeing mothers and babies who’ve died and other terrible stories, reflecting on changes across history, and how different things are less than 100 years down the line”. (Continued on page 4)
She wrote her MSc in Epidemiology while pregnant with Sam (now 9), and her MD while pregnant with Ruth (now 6), handing both in a couple of weeks before they were born. "My research is always closely tied to their lives. I'm really keen on encouraging women in research, particularly showing that it is possible to train part-time (both clinically academically), and still be successful. I'm determined that if you're bitten by the research bug you should be able to follow it whatever your personal circumstances".

Susan feels that CCACE is an ideal environment for such multi-disciplinary studies, due to the variety of expertise available “I like the broadness, the bringing together of different people - in CCACE the expertise from one specialty can be easily transferred to somewhere else. I love the fact that I have one projects with stroke researchers, neuro-imaging specialists, psychologists, geriatricians, endocrinologists... all different types of people... This is part of what CCACE is good at – building those links and seeing people from different specialties working together across a commonality – that cognition is important across all ages... It’s all about bridges between different subjects, people, topics, and linking things together”

And Susan is making the most of the diverse backgrounds of CCACE members with her other projects, working with Joanna Wardlaw to develop a searchable database of normal brain images; collaborating with Gillian Mead on the “Fatigue after Stroke” study using routine brain scans to investigate the effect of fatigue on age changes in cortisol, and looking at other potential uses for routine data taken from patients. “There’s so much information on patients that pass through acute hospitals that isn’t being used for research questions, so [we’re] working our way through the data protection and ethical issues associated with that”. These data could potentially be used to predict who might develop cognitive impairment, and help target interventions towards these patients. Social factors might also have a role to play. “The Attitudes to Ageing questionnaire was funded by the British Geriatrics Society and sent out to LBC1936 participants. It’s a new area for me, but really interesting to see how people’s health and mental wellbeing influences their attitudes to ageing and vice versa.”

“With Ian [Deary] I’ve seen the LBC study go from recruitment in a room off one of the wards at the Western General, to CCACE having developed into a multi-million pound infrastructure. To see the vision that took that forward was really inspiring”. And for the future? Susan hopes that her research will improve clinical practice for patients with dementia. “Dementia care is on the crest of a wave politically (It is Dementia Awareness Week 18-24 June)... so having the research background and being able to be part of those groups is really useful. Part of how this will move forward will be in the Dementia and Delirium Implementation and Management group in NHS Lothian, trying to help influence policy.”

“I see that [lifecourse influences] as having a broad public health impact, but it will never translate directly into clinical work, so I’m quite excited by the idea of looking at how routine data might fit in.... The brain image bank – as well as the proposed pathology bank - has a lot of potential to become a useful resource. This is a transition time for me. I’m tying to consolidate papers [and] grants to get some of these ideas off the ground and hoping that CCACE is renewed in 2013”.

Andy MacLeod and Robin Morton

**Max Perutz science writing award**

This competition is open to Current MRC-funded PhD students and MRC early career researchers with a maximum of six years of experience since completing their PhD. The winner will receive a £1,500 cash prize. More information can be found at [http://www.mrc.ac.uk/Sciencesociety/Awards/Competition](http://www.mrc.ac.uk/Sciencesociety/Awards/Competition). The deadline for applications is: 8th June 2012.
CCACE promotes postgraduate training in Cognitive Ageing and Cognitive Epidemiology. We are interviewing CCACE postgraduate students about their career, their research and their hopes for the future. Here we speak to second year PhD student **Heather Moore** (Right), part of the Mitochondrial Research Group based at the Newcastle Lifelong Health and Wellbeing Centre for Brain Ageing and Vitality and co-supervised by Professor Ian Deary. Heather’s PhD focuses on the importance of mitochondrial function for cognitive ageing.

**What did you do before coming to CCACE?**
I have a BSc in Psychology from the University of York. Throughout my degree I built up experience of research while working at the Centre for Reading and Language. I also worked with children and adults with special needs. From there I headed north (relatively speaking!) to do an MSc in Cognitive Neuroscience at Durham University.

**Why did you become interested in Science?**
I'm not sure I considered myself as interested in ‘Science’ when I was younger. I was fascinated by human nature and what drives behaviour, which led me in to Psychology. Undergraduate work experience showed me how exciting it is to work at the forefront of knowledge and learn more about an area that directly benefits individuals.

**What excites you about your research (or what preoccupies your mind most)?**
Cognitive ageing is something that everyone will experience (eventually), so developing our understanding of the link between brain, environment and behaviour is an intriguing and worthwhile area of research to me. What preoccupies me most is the vast amount of data I’m collecting, and how to go about analysing it, making the most of the data. Nevertheless, it is also exciting to use this data to explore relationships to cognitive ageing.

**What are your hopes for your research?**
I would like to explore the mechanisms and possible mediators of cognitive ageing, in order to contribute to the understanding of cognitive ageing in a real way. I hope to always conduct research that may lead to benefits for individuals in society.

**How would you describe your research to a member of your family?**
I am looking at cognitive ageing in patients with mitochondrial disease. Mitochondria are the organelles in every cell in our bodies that generate energy. Mutations in DNA cause the mitochondria to malfunction, which subsequently leads to less energy for vital cellular functions and leads to tissue dysfunction. The brain has high energy demands, so is likely to be affected by deficient energy production and problems with cognitive processes are expected. Mitochondrial mutations accumulate with age, so mitochondrial disease could be a useful analogue for cognitive decline across the lifespan.

**What do you like to do when you are not doing research?**
Too many things to do anything well! I sing in a choir and play saxophone in my spare time. I also love to dance ballroom and salsa, go to Pilates and work out at the gym. I like to relax by watching films, reading, and spending time with friends.
CCACE at the Science Festival—IncrEDIBLE Brains

A live interactive research study formed the centrepiece to the Centre’s contribution to the Edinburgh International Science Festival this year. Over 2,500 people visited the exhibition space from 11-15 April to take part in 6 activities as part of the College of Medicine and Veterinary Medicine Family Friendly Activities. CCACE put on its most successful interactive stand to date and was selected as the most popular activity by visiting families. Dr Elaine Niven part of the Human Cognitive Ageing Group designed and conducted a study to look at memory binding of objects and colours across the lifecourse. Participants were then encouraged to add their own data to the graph.

Also popular this year were the 3D brain (above) and our IncrEDIBLE jelly brain. CCACE PhD student Laura Pidgeon said “It was a highly enjoyable experience, I had some really stimulating discussions with both adults and children about cognitive ageing and psychology in general. It was a great feeling when you told a child a fact about the brain and then heard them excitedly explaining what they had learned to their friends or family”. CCACE is grateful to all this year’s volunteer demonstrators.

6-Day Sample Update

In the last newsletter we told you about an exciting new research study hosted by CCACE, the 6-Day Sample. The study has now received full ethical approval. The next step for the study is to secure permission from the Privacy Advisory Committee to link the existing data on the 1,208 members of the 6-Day Sample with the NHS Central Register and Scottish Morbidity Records.

Work has also begun on analysing the 16 years’ worth of data collected during the original 6-Day Sample study. This has been aided by a new addition to the study team. Catherine Calvin, who has just submitted her PhD in the field of cognitive epidemiology, joined the team in February, focussing on predictors of social mobility and attainment.

One of the unique and fascinating aspects of the 6-Day Sample are the comments made on the annual schedules about the Sample members’ lives. The majority of schedules were completed by an army of home visitors, who often developed good relationships with Sample members:

“I am again impressed with the contented and happy atmosphere in this home. Her parents, simple and industrious, welcome me warmly, even insisting on serving tea. As the previous day was her 21st Birthday I was given a piece of birthday cake baked - and iced - by the mother”.

It is hoped that some qualitative analysis will be carried out on these comments, which tell us a great deal about not only the Sample members, but about the home visitors themselves, the study in general and the social conditions in Scotland in the 1950s and 1960s.
CCACE runs a one year distance learning postgraduate certificate ‘Cognitive Ageing Research Methods for Medical Scientists’ (CARMMS). We are currently recruiting for 2012/2013 entrants (Deadline 31st July 2012). Here we speak to Dr Gopal Deivasikamani who is a year 5 specialty trainee in geriatric medicine at the Royal Preston Hospital. He was one of the first students on the programme.

What is it and who is it for?
This course aims to equip students with a critical understanding of cognitive ageing and cognitive epidemiology. It also helps participants develop critical appraisal skills, an understanding of the research governance framework covering cognitive research, and the intellectual and practical skills needed to design and carry out cognitive research. The course is for anybody with an interest in cognitive ageing, dementia, and delirium and postgraduate students who need training in setting up a research proposal.

What is it like?
It involves online distance learning in a virtual learning environment with one optional in house session to Edinburgh. The programme is made up of six modules. Each worth 10 Scotcat points, and so successful completion of the programme provides the 60 Scotcat points needed for a postgraduate certificate. There are two modules per semester: cognitive epidemiology and human cognitive ageing in semester 1, stress, hormones and cognitive ageing and animals models of cognitive ageing in semester 2. Research methods and the research project run parallel to the other courses throughout semesters 1 and 2.

When and why did you do it?
I completed the programme my third year of higher specialist training as a specialty trainee 5 in geriatric medicine. I did it to supplement my knowledge of cognitive ageing, to understand the research methods, and to get training in statistical and research skills.

How much effort did it entail?
The first four modules comprise weekly online lectures. There are also two research papers to read and an opportunity to discuss and critically appraise these papers in a discussion board. This needs 3-4 hours’ reading every week, but you also need time for writing up the research proposal. There isn’t an exam, but there are weekly multiple choice questions and you are assessed on your contributions to the discussion board and a research proposal, which is assessed and supervised by a designated mentor. The course is £3000 but many scholarships are available.

Was it worth it?
It was very useful to understand cognitive ageing and epidemiology. The relation between cognitive ageing and delirium and dementia was also fascinating and will appeal to clinicians who deal with elderly patients. The statistical skills I gained were very useful. The training in setting up a research proposal is vital for anybody with an interest in research. The course also provides an opportunity to plan and conduct research at the Centre for Cognitive Ageing and Cognitive Epidemiology.

Dr Deivasikamani wrote this course review for BMJ Careers (http://careers.bmj.com/careers/advice/view-article.html?id=20005823). For more information (including information about scholarships) visit http://carmms.mvm.ed.ac.uk or contact Programme Administrator, Dr Beverly Roberts (beverly.roberts@ed.ac.uk).
The Minister for Public Health, Michael Matheson MSP, has announced the continued funding of the Scottish Dementia Clinical Research Network (www.sdcrn.org.uk) for a further 3 years. He made the announcement at the SDCRN’s 2nd annual conference at the Huntingtower Hotel, Perth.

Congratulations to Dr Mario Parra who has been awarded a 3 year Alzheimer’s Society Fellowship for £187,000 to investigate short term memory binding as a sensitive marker for Alzheimer’s Disease. Short-term memory binding tests have proved sensitive and specific to Alzheimer’s disease (AD). This fellowship program will address whether such tests can predict who among the elderly with mild cognitive decline will develop this type of dementia. It will also investigate the brain regions responsible for this cognitive function and their vulnerability to AD. Finally, the relation between short-term memory binding deficits and difficulties in tasks of everyday life will be also investigated. This program is expected to lead to the introduction of this methodology into clinical scenarios.

Dr Karen Horsburgh has also had success with an Alzheimer’s Society grant for £335,000. Karen said “This project will help to show us what changes can occur very early on in the development of vascular dementia and what changes can be caused by a slight reduction in blood flow to the brain. (SDCRN Funding Extended)

13 Apr @GlasgowSkeptics Ian Deary of the @ccace tells of Ten Quite Interesting Things About Intelligence Test Scores. http://youtu.be/MGnCYdr7dYE An excellent talk! #SITP

11 Apr Andy MacLeod @nailest @CCACE scientists (plus giant floating brain!) at @NTLMuseumsScot until Saturday for @EdSciFest. http://twitpic.com/98jpl

11 Apr @ccace Come and see our incrEDIBLE jelly brain at the National Museum of Scotland L2. Oh & test your own brain too @EdSciFest http://pic.twitter.com/4dwns4as

4 Apr @AlzScotDRC Newly published PLoS ONE paper from @ccace that provides a method to measure sarcopenia with brain volume http://bit.ly/Hf3YMY.

2 Apr @ccace We are very excited about a new LBC1921/LBC1936 project with author Ann Lingard http://www.annlingard.com/ UoE HSS KE Fellow. More details soon

20 Mar @ccace I’ve favourited an @YouTube video http://youtu.be/FiVrrZoQgbc?a ISSID 2011: Intelligence across the lifecourse

19 Mar @ccace James Goodwin on a recent CCACE publication: “A Spark of Genius from the Minds of Many” http://wp.me/p11XXC-p6 via @wordpressdotcom

19 Mar @ccace I’ve added a video to an @YouTube playlist http://youtu.be/DyzTt6U65iY?a Human Cognitive Ageing Group.m4v

23 Feb @AlzScotDRC The Scottish Dementia Brain Tissue Bank now has ethics go ahead. We will start recruiting soon. http://bit.ly/zw0HSu http://www.sdcrn.org.uk
Alzheimer Scotland Dementia Research Centre Jim Jackson Essay Prize

The Alzheimer Scotland Dementia Research Centre has launched an essay prize competition which commemorates the name of the late Jim Jackson OBE, former Chief Executive of Alzheimer Scotland Action on Dementia who also provided the vision for the founding of the Alzheimer Scotland Dementia Research Centre.

Essays of up to 8,000 words in length are sought on a subject pertinent to dementia, from a medical, biological or sociological point of view. Assessment will take into account overall presentation, structure, strength of argument, completeness and relevance of supporting literature, conclusions and implications for dementia cure, care or prevention. First prize is worth £500, the closing date is 30 June 2012. For more information see www.alzscotdrc.ed.ac.uk

Dates for Your Diary


4th September 2012, 5.00 pm. Annual Research Day 12.00-5.00 pm. Room F21, 7 George Square, Edinburgh EH8 9JZ. Open to all. There will be a wine reception from 5 pm.

Keynote Lecture: Dr Denise Park, The Center for Vital Longevity, University of Texas at Dallas.

30 November 2012, 5.00 pm. St Andrews Day Lecture. Dr Archana Singh-Manoux, INSERM.

Seminars take place in Room F21, 7 George Square, Edinburgh EH8 9JZ. They are open to all and will be followed by a wine reception.

Using the CCACE Core Staff

If you have a project or grant application that would benefit from the skills offered by any of the CCACE core staff please contact them directly or e-mail ccace@ed.ac.uk.

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If you have any news, planned events, new research grants, new prominent research papers, or media coverage of your work - or any questions about the centre - then please get in touch with Robin Morton, Centre Knowledge Exchange Officer by e-mailing robin.morton@ed.ac.uk or calling 0131 650 8292.

www.ccace.ed.ac.uk