Welcome to the Spring CCACE newsletter featuring news & updates. Please visit our website at www.ccace.ed.ac.uk for more information or follow us on Twitter or Facebook.

New Directions for the Lothian Birth Cohort 1936

The Lothian Birth Cohort 1936 is branching out in two new collaborations, one focussing on living spaces and wellbeing and the other on sedentary behaviours and activity.

The work will be supported by two grants totalling £2.5million from the Life Long Health and Wellbeing initiative. LBC1936 Director, Prof Ian Deary said, "We're off in some new directions with the Lothian Birth Cohort 1936. We've joined with new collaborators in Edinburgh College of Art and Geography to look at how aspects of living spaces contribute to people's wellbeing. Our focus has tended to be on people's constitution, health and lifestyle, but now we shall have high quality information on their physical environments and how those are associated with the ageing process."

Ian has also recently been awarded a research prize of £10,000 from Winton Capital Management, which he will use to further the ageing work; congratulations Ian.

Also In This Issue

CCACE Marks 100 Years of the MRC
Schizophrenia Genes & Cognition

Six Day Sample

The Wisdom of Age Trumps the Speed of Youth

CCACE MRC Centenary Debate

26 June 2013
6.30—8.00 pm
Followed by a wine reception
For tickets visit ccace.eventbrite.co.uk/
CCACE Marks 100 Years of the Medical Research Council

The Medical Research Council is 100 years old this year. 100 years since “one penny in respect of each insured person in the United Kingdom” was set aside by parliament for the Medical Research Fund; about £57,000 per annum.

To mark the centenary year of the Medical Research Council (1913 — 2013), CCACE is hosting two very different events, an open day and an evening debate.

On the evening of Wednesday 26 June a former MP and a current MSYP (Member of the Scottish Youth Parliament) will take part in a debate, chaired by broadcaster Sally Magnusson to mark 100 years of medical innovation. Kyle Thornton, MSYP (19) will propose “The wisdom of age trumps the speed of youth?” while veteran parliamentarian Tam Dalyell (80) will oppose. The debate will take place across George Square Gardens from CCACE in George Square Theatre.

Amazing Brain will follow one person’s journey through 10 decades of life, looking at how the brain changes throughout that lifetime and how scientists at CCACE measure those changes. Visitors will navigate a brain maze and in each “decade”, will explore a different aspect of cognition.

Amazing Brain will take place in the basement of the Department of Psychology, 7 George Square from 10:00 – 16:30. The debate will start at 18:30 and be followed by a wine and canapés reception in the Department of Psychology from 20:00 – 21:30. To book free tickets for these events, visit: http://brainmaze.eventbrite.co.uk/ and http://ccacemrcdebate.eventbrite.co.uk/

CCACE Leads on Standards for the Vascular Contribution to Neurodegeneration

Professor Joanna Wardlaw, CCACE Group Leader has led a worldwide collaboration to standardise the terminology used to determine vascular imaging anomalies. The paper describing the recommendations of the Centres for Excellence in Neurodegeneration (CoEN) Working Group on Standards for Determining the Vascular Contribution to Neurodegeneration has been accepted by Lancet Neurology pending minor revisions.

Joanna Wardlaw (right) said, “This is a major output for the whole of cerebral small vessel disease and vascular dementia (which account for 45% of dementias) and very significant for CCACE. This collaboration involved co-operation of 28 groups worldwide, three major countries’ funders, including the MRC, and will be a major standard for future vascular cognitive impairment and dementia research”

This publication follows a major invited review on pathogenesis of cerebral small vessel disease which came out in the Lancet Neurology a few weeks ago (Wardlaw, Smith & Dichgans. Lancet Neurol 2013; 12: 483–97). .

Professor Wardlaw added “Imaging at Edinburgh is going from strength to strength, we are currently looking at replacing our 1.5T Brain Research Imaging Centre MR scanner at Little France, co-located with the main hospital and the Centre for Regenerative Neurology/Medicine among others and extending our work on late life brain ageing, vascular disease and neurodegeneration into its origins in early life.”
**MRC Centenary Early Career Research Awards**

To mark 100 years of achievements by MRC scientists, the MRC offered the very best of its early career researchers the opportunity to accelerate their research and their career development. £12M was available to eligible MRC early career researchers to provide extra time and resources to take new and challenging research to a decisive stage and develop skills that would allow early career researchers to move to the next step in their careers. In July 2012, Six CCACE researchers were successfully awarded £120,000 from this call. As the applications were of an extremely high standard CCACE is contributing the balance of £16,500. The successful projects were:

**Dr Tom Booth (£29,500):** Picturing the brain at age 92: An imaging study of the LBC1921.

**Dr Catherine Calvin (£24,500):** Linking the Scottish Mental Surveys of 1947 to health records.

**Dr Fergus Doubal (£20,000):** Measuring vascular reactivity in cerebral small vessel disease.

**Dr Dominika Dykiert (£23,700):** Diabetes or poor cognition: Which comes first?

**Dr Mario Parra (£14,000):** Mechanisms of working memory binding deficits in Alzheimer's disease.

**Dr Zoe Tieges (£24,800):** Software for the detection and monitoring attentional deficits in delirium.

For example, the Centenary Early Career Research Awards scheme is supporting CCACE member **Dr Mario A Parra** to help set up a new international network to investigate brain disconnection as the underlying mechanism of working memory binding deficits in preclinical Alzheimer’s Disease.

The one-year grant is supporting the collaboration between the Human Cognitive Neuroscience (HCN) group and CCACE at the University of Edinburgh and the Institute for Cognitive Neurology (INECO) in Buenos Aires, Argentina. It aims to build an infrastructure, focussing on the harmonization of methods. It is also expected to enable data sharing between labs, boost sample sizes and the robustness of future analyses.

A second aim of the collaboration is to combine both expertise and resources in behavioural and electrophysiological methods to develop biomarkers of neurodegeneration. Dr Mario Parra visited INECO in March and April this year to develop the collaboration. During his visit the research team focussed on the analysis of the data collected in the first two experiments. The first addressed behavioural measures of working memory binding, a function known to be highly sensitive to Alzheimer's disease. This first experiment was also aimed at preparing the memory binding task for simultaneous EEG and ERP recording. The second experiment looked at EEG activity from 23 healthy young participants while they performed the memory binding task. Initial results have allowed us to identify the most suitable setting to investigate brain connectivity mechanisms subserving binding functions carried out in working memory. Using the Default Mode Network (DMN) methodology we will learn how this connectivity builds in intact brains and how the disconnecting pathology develops in brains undergoing neurodegeneration.

Dr Agustin Ibañez, Director of the Laboratory of Experimental Psychology and Neuroscience, INECO will visit CCACE in June to continue with the harmonization process and help to set up the DMN lab. The initial support received from the MRC has proved fruitful and it is intended that this support will lead to a major grant application by the end of 2013.
Schizophrenia Genes Associated with IQ Loss in Old Age

CCACE-member Professor Andrew McIntosh and colleagues recently showed that people at greater genetic risk of schizophrenia could see a fall in IQ as they age. The study also shows that IQ decline in those at risk could happen even if they do not develop schizophrenia.

The study compared the IQ scores of more than 1,000 people from the Lothian Birth Cohort 1936, measuring general cognitive function at age 11 and again at around 70 years of age. Genetic analysis revealed each subject’s genetic likelihood of developing schizophrenia, even though none of the group had ever developed the illness.

IQ scores of people with a high and low risk of developing schizophrenia were compared. There was no difference between the two groups at age 11, but people with a greater genetic risk of schizophrenia had slightly lower IQs at age 70.

Those people who had more genes linked to schizophrenia also had a greater estimated fall in IQ over their lifetime than those at lower risk.

Ian Deary said “Retaining our thinking skills as we grow older is important for living well and independently. If nature has loaded a person’s genes towards schizophrenia, then there is a slight but detectable worsening in cognitive functions between childhood and old age.”

Professor McIntosh (pictured) from the Centre for Clinical Brain Sciences led the research “With further research into how these genes affect the brain, it could become possible to understand how genes linked to schizophrenia affect people’s cognitive functions as they age.”

Schizophrenia affects around 1 per cent of the population, often in the teenage or early adult years, and is associated with problems in mental ability and memory.

The study, which was funded by the BBSRC, Age UK, and the Chief Scientist Office, was published in the journal Biological Psychiatry.


News in Brief

Understanding the Oldest Old: Ian Deary & John Starr have contributed to an authoritative guide to understanding ageing, produced by Age UK called understanding the Oldest Old. This will be distributed widely and is available at http://www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/Improving%20Later%20Life%20%20WEB.pdf?dtrk=true%20

Lorna Lopez: CCACE bid a fond farewell to Dr Lorna Lopez who has taken up a post at the University of Dublin in Ireland.

CCACE Academy: Keep up to date with the cognitive ageing and cognitive epidemiology at the CCACE Academy 'bringning you up to speed on how life affects thinking skills and vice versa.

The Big Picture: A collaboration between the Lothian Birth Cohorts and artist Fionna Carlisle has been featured in the latest Psychology magazine 'Big Picture'. The image shows the artist with a portrait of Ian Deary in progress. Fionna is currently painting LBC participants.
6-Day Sample Recruitment Underway

It has been a busy year for the 6-Day Sample study, an exciting new research study investigating life-long influence on health and wellbeing. In September 2012 the study gained permission from the Privacy Advisory Committee to not only trace and contact surviving members of the 6-Day Sample but also to trace and link childhood data with health data held within the Scottish Morbidity Records for the entire Scottish Mental Survey 1947. In May 2013 the equivalent permissions were obtained to do the same for those individuals who have ever lived in England and Wales. This will be the first study of its kind anywhere in the world, representing a unique opportunity to link childhood intelligence to life-long health outcomes in an entire year-of-birth population.

The team, with input from 8 principal investigators offering expertise across a broad spectrum of sociological, educational, psychological and medical research, developed an invitation box containing a detailed questionnaire and a physical testing kit. Devising the instructional booklet and DVD for the physical tests was an important part of creating the kit.

The instructions needed to be clear and easy to follow in order to ensure consistency across participants. The finished product can be viewed on CCACE’s You Tube channel at  . 543 invitation boxes were assembled and driven to Dumfries for posting to surviving 6-Day Sample members living in Scotland.

Nearly 100 invitation boxes will be posted to Sample members living in England and Wales within the next few weeks.

At the time of writing, 138 individuals have completed the questionnaire and returned biological samples for genetic and cortisol analysis and are moving onto the next stage of the study, which will involve cognitive testing over the telephone. Caroline Brett, research assistant and study co-ordinator, has spoken to dozens of Sample members on the phone. Many of them remember the original study, often with fondness. A surprising number can recall the original intelligence test and several have quoted the same question, which they remember all these years later. Of course, many Sample members are not interested in taking part, but for those that do it is a worthwhile experience. I will leave you with a quote from one participant:

"I was very pleased to be asked to take part in this survey. Over the years since 1964 I have often wondered if the collected information had been used... This is the first time I have done a questionnaire like this - and I am very impressed”

Caroline Brett, 6-day Sample Co-ordinator
CCACE PhD Student News

The CCACE PhD cohort recently welcomed three new students – in January, Sandra Crombie commenced her PhD studentship in the Animal Models of Cognitive Ageing and Neural Health group; Ratko Radakovic joined the Alzheimer Scotland Dementia Research Centre in September; and Stuart Ritchie, in the final year of his PhD, has also joined the centre as an affiliated student.

In November, many of the CCACE PhD students travelled down to Newcastle for the 2 day XCAR Early Career Researchers Conference. At this meeting, students and postdoctoral researchers from centres across the country funded by Lifelong Health and Wellbeing came together to present their work, and also took part in interactive sessions with Research Council members. Presentations were given by CCACE students Alixe Kilgour, Donald Lyall, and Laura Pidgeon.

At the CCACE-hosted LLHW Showcase meeting, which followed in December, 1st year student Stephen Rhodes was awarded the prize for best poster presentation for his poster titled ‘Ageing and Feature Binding in Visual Working Memory: The Role of Presentation Time’.

Congratulations also go to 3rd year student Donald Lyall, who has recently seen his work published in the journal Behavior Genetics, with his article, "ADRB2, brain white matter integrity and cognitive ageing in the Lothian Birth Cohort 1936".

Topping off the list of academic achievements, Alixe Kilgour was awarded the Kate Johnstone prize for best oral presentation at the joint meeting of the Scottish Society of Physicians and the British Geriatric Society (Scottish Branch) for her talk, "Skeletal Muscle 11betaHSD1 Expression is Associated With Lower Muscle Strength in Ageing".

CCACE students have also been keeping busy outside of work. Affiliated student Mark Horne was recently featured in an article in The Scotsman about his plans to complete the ‘Vikingarannet’, a 50 mile ice race from Stockholm to Uppsala in Sweden. On February 10th he finished this race in only 4 hours 23 minutes, the fastest time by anyone residing in the UK. This is in addition to taking on Mount Kilimanjaro in June alongside Laura Pidgeon and Michael Craig, to raise money for international development charity, Childreach International.

Email L.M.Pidgeon@sms.ed.ac.uk for more information or visit https://mydonate.bt.com/fundraisers/edpsychkili to donate to Childreach!

Laura Pidgeon, PhD Co-ordinator

Genetic Analysis of 10,000 Scots – Genetics Research on Cognition and Depression

CCACE member Dr Riccardo Marioni is leading the analysis of cognitive and genetic data from over 10,000 members of Generation Scotland’s Scottish Family Health Study (www.generationscotland.org). Riccardo, who is a University of Edinburgh Chancellor’s Fellow, is working closely with Dr Caroline Hayward of the MRC Human Genetics Unit on the first round of analysis. The MRC funded the genetic sequencing (GWAS and Exome Sequencing) as part of the MRC HGU’s Quinquennial Review. GS:SFHS data provides detailed cognitive measures, plus life histories and validated measures of depression. Initial quality checks look good with a number of replicated ‘hits’ for e.g. cholesterol. Professor David Porteous presented a summary update at the ‘Innovation in drug discovery and stratified medicine’ symposium at the EICC on 8th May.
CCACE promotes postgraduate training in Cognitive Ageing and Cognitive Epidemiology. Here we interview CCACE postgraduate students about their career, their research and their hopes for the future. This issue we speak to first year PhD student Stephen Rhodes (Left). Stephen is part of the Human Cognitive Ageing Group and his Supervisors are Professor Robert Logie and Dr Mario Parra

What did you do before coming to CCACE?
I completed my undergraduate degree in Psychology at the University of Leeds in 2011 before moving up to Edinburgh to join CCACE and study for an MSc in Human Cognitive Neuropsychology and then start my PhD.

Why did you become interested in Science?
The idea of designing experiments and conducting research into unanswered questions really appeals to me. I am specifically interested in memory as it is so central to everyday life and yet there are still so many areas to be explored in this very broad field.

What excites you about your research (or what preoccupies your mind most)?
We still have so much to discover about how age affects different cognitive abilities. At the moment I am focusing on the ability to hold visual information in an active state over short periods of time (also known as visual working memory), as this ability seems to be particularly susceptible to the effects of age, but there are many other specific abilities that exhibit pronounced decline across the lifespan that I would like to look at in the future.

What are your hopes for your research?
During my PhD I hope to better characterise the deficit exhibited by older adults when performing tasks assessing visual working memory and possibly try to understand these deficits at a biological level using neuroimaging methods.

In the long run I would like to develop a greater understanding of the effects of age on different cognitive abilities and, if possible, develop more comprehensive behavioural markers of cognitive ageing.

How would you describe your research to a member of your family?
The amount of information we can hold in an active state within our visual working memory is limited and becomes increasingly limited as we age. This has important implications for numerous behaviours; for example, maintaining the locations of various unattended hazards whilst driving, or remembering the types of medication in different coloured packets. I want to better understand why our visual working memory is so susceptible to age by looking at the different cognitive processes underlying this ability.

What do you like to do when you are not doing research?
I enjoy seeing friends and family, reading, and playing the drums whenever I can get onto a kit as I don't have enough room here in Edinburgh. I also like to go hillwalking and cycling, although I probably don't do as much of these as I should.
Royal College of Psychiatrists Prize for Dr Tom Russ

Congratulations to Dr Tom Russ (right) on winning the prestigious Royal College of Psychiatrists in Scotland Research Prize 2013. Tom, a PhD student, receives a £500 prize for his paper published in the British Medical Journal on the association between psychological distress (anxiety and depression) and mortality.

This novel paper, co-authored by David Batty and John Starr, is the first to clearly show an association between low (sub-clinical) levels of psychological distress and premature mortality. It raises the possibility that low levels of distress should perhaps be treated more proactively in general practice. The authors used the specialised methodology of individual participant meta-analysis to pool a series of cohort studies to produce the largest dataset to date to examine this relationship.

The paper stems from a collaboration between CCACE, the Scottish Dementia Clinical Research Network (SDCRN), University College London and the University of Helsinki. It received a great deal of media coverage on publication, including in the national newspapers, a recorded interview on BBC Breakfast television and the Scottish BBC news, and live interviews on BBC Radio 4 Today, BBC Radio Scotland and numerous regional radio stations.

Professor David Batty, Head of the Cognitive Epidemiology Group, who co-supervises Tom with Professor John Starr said "I'm delighted for Tom; this is a prestigious prize and an excellent achievement for any academic, particularly a student. It signals the first application worldwide of the individual participant meta-analysis technique to understand the influence of distress on health."


A selection of posts from Twitter
Follow @CCACE in 140 characters or less at: http://twitter.com/ccace

@AlanJohnGow 1 May Based @uni_copenhagen for 3 months to investigate lifestyle factors and cognitive ageing, a collaboration with @HeriotWattUni and @ccace RT

@AlanJohnGow 26 Apr Science from @ccace meets art in the latest The Psychologist from @BPSOfficial pic.twitter.com/d4kXlTrj8k RT

@OPENspace_rc 26 Apr Great start up meeting for new Lifelong Health & Wellbeing project, Mobility, Mood and Place. Thanks @ccace @CRESHnews @HeriotWattUni RT

@ccace 8 Apr Ian Deary talks about his hopes for the future of studying the human brain for @Strictly_Sci http://youtu.be/hr91MTjuVFo @LLHWresearch

@nailest 6 Apr @ccace’s giant floating brain is back at @edscifest http://instagram.com/p/Xwk8fHnTzO/ Retweeted by CCACE

Gareth HaggerJohnson @hssghj22 Mar @PerPsy2013: low conscientiousness predicts death in Lothian ( @ccace), Whitehall II ( @uclnews), MIDUS, Hawaii & Terman cohorts. Why? RT

@ccace 1 Mar Schizophrenia genes ‘damage IQ as you age’ - Health - http://Scotsman.com: http://www.scotsman.com/health/schizophrenia-genes-damage-IQ-as-you-age-1-2801941#.UTC5yZGAzaM.twitter ...

@AlanJohnGow 24 Feb Online now: CMV infection and cognitive ability http://www.sciencedirect.com/science/article/pii/S0197458013000419 … @ccace @age_uk RT by CCACE

@BBSRC 21 Feb People at greater genetic risk of schizophrenia more likely to see a fall in IQ with age - Study by @ccace http://ht.ly/hUyNs Retweeted by CCACE

@ccace 5 Feb CCACE were proud sponsors of the Edinburgh City Libraries Get Up & Go Awards 2012, find out more: http://youtu.be/d-arUjvQuNg?

@ccace5 Feb New video about the Lifelong Health and Wellbeing Initiative which fund CCACE http://youtu.be/ZaCbsI9k16g?
Congratulations to Professor David J. Porteous, FRSE who has been awarded an OBE for services to Science in the Queen’s New Year Honours List 2013.

Professor Porteous, (pictured right) is Group leader for the CCACE Genetics and Statistics of Brain Ageing Group and Professor of Human Genetics and Medicine at the University of Edinburgh Institute of Genetics and Molecular Medicine. Professor Porteous has published over 250 peer reviewed papers, for example, on the genetic risk of developing psychiatric disorders (such as the role of DISC1 in the risk of developing Schizophrenia) and Cystic Fibrosis. He has been integral in the development of Scotland’s largest genetic biobank, Generation Scotland. He is also Head of the Medical Genetics Section, Director of the Molecular Medicine Centre, University of Edinburgh and of the Genetics Core at the Wellcome Trust Clinical Research Facility, Edinburgh.

CCACE Dates for Your Diary

3rd—5th June. Introduction to R Programming A 3-day short course on the R statistical programming language. See www.ccace.ed.ac.uk

5th June 2013 5.00 pm. Professor Jonathan Flint, University of Oxford. “The genetic analysis of depression”.

3rd September 2013, 1.00-5.00 pm. 6th Annual Research Day Room F21, 7 George Square, Edinburgh EH8 9JZ. Keynote Lecture: Professor Sudha Seshadri, Boston University Alzheimer's Disease Center.

8th October 2013, 5.00 pm. Dr Colm Cunningham, Institute of Neuroscience, Trinity College Dublin.

26th November 2012, 5.00 pm. St Andrews Day Lecture. Professor Barbara Sahakian (TBC), University of Cambridge.

All seminar ar held in Room F21, 7 George Square, Edinburgh EH8 9JZ. They are open to all and 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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