The Disconnected Mind aims to understand how changes in the brain’s white matter - its connectivity - contribute to age-related cognitive decline in humans.

Newsletter 35: September 2016
Welcome to the Summer Disconnected Mind newsletter of 2016. As always, this issue includes some of our recent publications, the regular contribution from our colleagues at Age UK, and news and reports from recent events. Please get in touch for more information about anything in the newsletter, particularly if you have something you would like to be included in a future issue. Contact details can be found on the last page.

LBC1936 Study Update – Wave 4
Data collection from LBC1936 participants for Wave 4 is currently ongoing. As of 30th August 2016, we have had the usual superb response from LBC1936 cohort members. We have seen 520 participants at the Wellcome Trust Clinical Research Facility, completing cognitive and physical tests for a fourth time, at about age 79. So far, 343 have already completed a brain MRI scan and 435 have completed a Doppler ultrasound of their carotid arteries.

Last year in December, we updated you on our collaboration with Cedars-Sinai Medical Center, in Los Angeles, USA, in production of induced Pluripotent Stem Cell (iPSC) for from LBC1936 cohort members’ blood samples. This will allow us to explore ageing at a biological cell level. We are delighted to announce that, with the piloting over, the first batch of blood samples has been sent to for processing to Cedars-Sinai Medical Center. This is the beginning of a fruitful collaboration that will undoubtedly influence our understanding of ageing.

Early life influences on assessment of cognitive decline
Mini-Mental State Examination (MMSE) is a widely used screening test for potential cognitive impairment, by General Health practitioners, specialists and researchers. It has a maximum score of 30, and a score of below 24 is widely used to indicate possible dementia.

A recent study by Dr Dominika Dykiert, a Disconnected Mind-funded Postdoctoral Researcher, and colleagues (published in Psychological Medicine) showed that the MMSE score at age 70 correlates with the level of prior cognitive ability at age 11, that is, the baseline level of cognitive ability before an onset of any decline or impairment. This finding suggested that the same MMSE score may actually indicate different amounts of cognitive pathology for people with different baseline levels of cognitive ability (or IQ). For example, the usual cut-off <24 points might be appropriate to use for people with average cognitive abilities, but it could mis-identify some people with lower Iqs and no pathology and, on the other hand, miss some people with high Iqs who experienced cognitive decline despite still performing at a relatively high level. Using scores from two tests that are used to estimate baseline cognitive ability (Wechsler Test of Adult Reading, WTAR; and National Adult Reading Test, NART), Dominika and colleagues derived a range of MMSE cut-offs based on prior ability. Using these prior cognitive ability-appropriate cut-offs might increase the rate of detection of possible dementia cases among people with high cognitive abilities, ensuring they receive timely treatment. At the same time, it would reduce the number of ‘false alarms’, where people who always had lower thinking skills are wrongly identified as having cognitive impairment.

These findings show the comprehensive contribution of the Disconnected Mind project is able to make to clinical practice and assessment. Furthermore, it adds to the growing influence of the LBC studies and their findings.
Age UK University Benefactor Award
At the University of Edinburgh Medical School graduation on Saturday 2nd July, Tom Wright received the University of Edinburgh Benefactor Award on behalf of Age UK. The Benefactor Award is the high honour, equivalent to an Honorary Degree, bestowed upon organisations that have given outstanding support to the University.

The laureation for the Award was given by Professor Ian Deary, Director of the Disconnected Mind project. Ian praised Age UK’s having given over £7 million in support for the project since 2004. He outlined the many important scientific reports that the study had produced and how useful the knowledge was for such an important societal problem. Ian also stressed how the Age UK funding had been a foundation from which more funding had been attracted, from which a MRC Centre had grown, and from which many young scientists’ careers had flourished.

In reply to Ian’s laureation, Tom Wright replied to the graduation audience, "We are immensely of the pioneering Disconnected Mind project. When it began in 2004, we could not have predicted how far its significance and reach would burgeon. Under Professor Deary’s leadership, the research is consistently of the highest quality. The findings are of profound significance, from the genetics of cognitive ageing to the lifestyle factors that help protect our thinking skills as we grow older. As well as publication in the highest impact journals, the project captures attention and imagination from the media and arts. It regularly hits headlines around the globe. Augmenting this enviable impact record, Age UK and the project team work together to transfer the findings to policy-makers and practitioners from health services to financial services. We hope and expect that our partnership will ultimately translate to better cognitive health and quality of life for older individuals and populations."

Grand Opening of the Godfrey Thomson Exhibition
July 28th saw the opening of an exhibition displaying and explaining a treasure trove of artefacts relating to Professor Sir Godfrey Thomson (1881-1955), a pioneering educational psychologist. He and his work—especially the Moray House Tests of intelligence—are at the core of the LBC studies. This will be displayed at the University of Edinburgh Main Library from Friday 29th July until 29th October 2016. Entrance to the exhibition is free, and it is open to the public. There are many nice mementos to take away from the exhibition.

The exhibition reconstructs Thomson’s life and work through personal and professional papers and the display of ledgers other materials from the two Scottish Mental Surveys. Sir Godfrey was an innovative educator with the firm belief that educational opportunity should not be linked to social status, and, from the 1920s onwards, he advocated comprehensive-style education. Thomson was based at the Moray House School of Education, which is now part of the University of Edinburgh. His greatest legacy for today’s researchers was to test the intelligence of almost every Scottish 11-year-old child in 1932, and again in 1947, resulting in the basis of the Disconnected Mind project.
For the first time, this exhibition presents the Scottish Mental Surveys’ unique ledgers to public view, with a selection of sample pages on show. These ledgers hold the world’s only record of IQ-type scores from full national year-of-birth cohorts.

Sir Godfrey's findings have formed the basis of much of the cutting-edge research at the University of Edinburgh since the late 1990's into how the brain ages, led by Professor Ian Deary. His team at the Disconnected Mind project studies the now-older people who took part in the Scottish Mental Surveys. Therefore, an annexe of the exhibition devoted to the Lothian Birth Cohorts’ work, showcasing the methodology and findings that are a foundation of the Disconnected Mind project.

Ian has spent the past decade investigating Sir Godfrey's life and, in 2008, he rescued a mass of never-before-seen documents and objects from Thomson’s family home in Edinburgh, just before it was demolished. A selection of those artefacts, portraits and documents feature in the exhibition, telling the story of who Sir Godfrey was and what his motivations were. The BBC took interest in this, interviewing Prof Deary about the exhibition.

Ian Deary said: "Godfrey Thomson saw mental ability tests as an imperfect but useful means to give poor children a chance in life. He was determined to look past pupils' social status, and try to see their underlying ability. By all accounts he was modest, not motivated by money, and happy to share academic wins, which in part led him to fade from the history books. I'm delighted we are now able better to understand and evaluate the pioneering work of this multi-talented and elusive man."

You can see Ian’s introductory film for the exhibition here: https://vimeo.com/175293625/0d1a00014c

**Brain Maze success**

In June, CCACE opened its doors to the public for the 2nd popular Brain Maze event. CCACE joined forces with the Centre for Regenerative Medicine (CRM) to put on the interactive open day event as part of the Medical Research Council's Festival of Medical Research. This interactive event was attended showed to be extremely well-received by the public, once more being a sold-out event. The crowd was interested in engaging in new and fascinating research and findings from the Disconnected Mind project.

The Brain Maze guided people through the network of corridors and 11 rooms, in the Department of Psychology, University of Edinburgh, where individuals experienced a different aspect of the ageing brain and body. Popular activities included a supermarket sweep game, where individuals went ‘shopping’ for lifestyle factors which affect how our brain ages (such as smoking) while busting a few ageing-related myths (like the lack of effect of brain training). In addition to this, the visitors got to experience the domains of cognitive ability LBC cohort members are assessed on as a part of the Disconnected Mind project, giving an insight in to the scope of this project. The Maze finished with a cafe where participants got the chance to speak with scientists and researchers allowing them...
to reflect on their experience of the Maze. Key to the event was the army of Disconnected Mind project researchers and team members, as well as CCACE, CRM and other scientists, who took the time out from their research to develop activities and help run the Brain Maze. A huge thank you to everyone involved.

You can see a snapshot of the event in a short video produced by the MRC:

https://www.youtube.com/watch?v=apYmHzWO1So

**Staff News**

Ciara Madden, Research Assistant leaves the Disconnected Mind project after studying and working with us for more than 2 years. She completed her MSc by Research entitled ‘Predictors of Resilience in Older Age: The Lothian Birth Cohorts of 1921 and 1936’ as a part of the Disconnected Mind project and during her employment on the project has been an integral part of the team, as well as a pleasure to work. We wish her all the best and much luck in all her future endeavours.

**Funding for new intervention research**

A new intervention study aimed at reducing cognitive ageing in old age will commence at the Ageing Lab, Heriot-Watt University, funded by the Velux Stiftung. The Intervention Factory is a three year research study which will test a range of activities within existing community-based programmes. The project will be directed by Dr Alan Gow, who used to be the Disconnected Mind Study Co-ordinator and will benefit from input from a local Intervention Factory Forum (including colleagues from Age Scotland, NHS Lothian and Edinburgh Council) and an international Advisory Panel (Professor Kaarin Anstey, Australian National University; Professor Ian Deary, University of Edinburgh; Professor Mike Martin, University of Zurich; Professor Kaisu Pitkälä, University of Helsinki; and representatives from Age UK).

You can follow progress as the study gets underway through the link below:

[www.healthyageing.hw.ac.uk](http://www.healthyageing.hw.ac.uk)

**Public engagement award**

Our ex-Study Co-ordinator Dr Alan Gow was recently awarded the Heriot-Watt Principal’s Public Engagement Senior Prize. The award was in recognition of a portfolio of work which included support from CCACE and particularly Robin Morton for last year’s Fringe performance as part of Edinburgh Beltane’s Cabaret of Dangerous Ideas, “The Great British Brain Off”. That 2015 show has since gone a few more places, including the Talk Science @ Irvine Bay programme hosted by the Royal Society of Edinburgh. The show explores the factors that might protect or harm the ageing brain, including some key LBC findings, and the audience are encouraged to share their ideas about the key lifestyle ingredients which forms the basis for discussions about how we might best protect our thinking skills as we age.

You can access a report from the event:


And can also watch the full show:

[https://www.youtube.com/watch?v=Z7PTzeU1LpA](https://www.youtube.com/watch?v=Z7PTzeU1LpA).

The Brain Off tour continues later in the year as the show was selected for inclusion in the British Science Festival being held in Swansea this September.

The public engagement award also recognised Alan’s work with Research the Headlines and their recent BA-funded “Rewrite the Headlines” initiative with schoolchildren and undergraduates. With follow-up funding from the BA, Alan is now developing activities to help older adults gain confidence in critically evaluating the research they see in the
media discussing the latest factor that might help or harm the ageing brain.

On the public engagement front, some LBC results related to physical activity and brain health also featured in Sian Williams new book. It was based on an interview that Sian recorded for her BBC Radio 4 series towards the end of last year.

The programme is still online:

http://www.bbc.co.uk/programmes/b065s
sr8

A shorter standalone piece can be found online as well:

http://www.bbc.co.uk/programmes/p02zz
7gl

News from Age UK
In this newsletter, we introduce you to Jane Vass, Director of Policy and Research at Age UK. We also report on the first output from the Global Council on Brain Health and our latest sporting efforts.

First, however, here are our Chief Executive’s words of gratitude to the University’s Vice-Chancellor for the Distinction of University Benefactor, as reported elsewhere in this issue.

Tom Wright said, “It was an honour to receive the Award on behalf of Age UK…our Board of Trustees and staff are incredibly proud… We very much hope that our partnership with the University and The Disconnected Mind project will continue to flourish and ultimately translate to better cognitive health and quality of life for older individuals and populations.”

In April this year, the Research team joined up with the Policy team, whose role is influencing the public and private sectors on a wide range of age-related issues. Director of the merged team Jane Vass has been with Age UK (and one of its predecessors, Age Concern) since 2006 in policy roles. Her particular specialism is financial services for older consumers. Her work was recognised by the OBE in the 2015 Birthday Honours. She wrote the Daily Mail Tax Guide for 10 years, and has prepared landmark reports on Alternative Dispute Resolution for the National Consumer Council and on financial capability for the Securities and Investments Board.

Jane said, “I’ve often mentioned the DMind project to people working in policy roles, and they’ve always been fascinated and keen to hear more. Research and policy have always worked closely together at Age UK, but we now have a golden opportunity to build on that, ensuring that our work is informed by the best academic research – including your emerging findings on brain ageing.”

As you know from previous newsletters, Age UK is a collaborator with AARP in the Global Council on Brain Health, which was established in 2015 to provide trusted information to public audiences on how we can maintain and improve brain health as we grow older. The Council is examining a series of topics; for each, it convenes an international panel of experts to review current evidence on the topic and make recommendations. The Council has recently published its first report, on physical activity and brain health.
Sleep and social engagement are the Council’s next two topics and we’ll let you know each time a new report is published.

This summer, Age UK teams took to triathlons! The elite team of Head of Volunteering Rebecca Stewart, Estates Surveyor in the Property Department Greg Bailey and Research Manager Marcus Green respectively swam (1.2 miles), cycled (56 miles) and ran (13 miles) their way to 1st place in the Team Relay at the Half-Iron Triathlon in Shropshire. Outstanding!

An amateur team consisting of Equalities and Diversity Manager Claire Ball (swim 1.5k), Volunteering Manager Bryan Precious (bike 40k) and Research Manager Libby Archer (run 10k) took part for fun rather than competitive purposes in the London Tri Olympic Relay class, completing enthusiastically but at somewhat slower pace!
Okbay, A., 192 authors, Deary, I. J., 68 authors, Benjamin, D. J. (in press). Education-associated SNPs are enriched for brain function and disorders. *Nature*.

**Newly ‘in print’**


You can stay up to date on the most recent DM research by checking the regularly-updated list of publications at: [www.lothianbirthcohort.ed.ac.uk](http://www.lothianbirthcohort.ed.ac.uk).

Those requiring a PDF version of anything listed should get in touch with Paul Redmond ([lbc1936@ed.ac.uk](mailto:lbc1936@ed.ac.uk)) in the first instance.

Do also keep Paul updated with your ‘in press’ or recently published papers. They’ll be added to the website to ensure everyone can see these as soon as possible, and may be profiled in a future newsletter.

**Contact**

Please get in touch with any items for inclusion in future newsletters.

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