



## Merry Christmas from the Lothian Birth Cohort 1936 Research Team

Season's greetings from the LBC1936 study team! We hope this annual newsletter finds you well. Before we begin to update you on the most recent news from the study, we would like to thank you for your continued participation. Do remember that everything in this newsletter has come about as a result of your participation, so thank you again for being so willing to contribute your time.

We hope the past year has been a good one for you. It's certainly been another productive one for the study, and we hope you are interested in reading about the latest results that 2012 has delivered. There are some details about the progress being made on the current wave of assessments and news from the team too. From all of us, best wishes for Christmas and the New Year.

### **The study continues**

As you know, the aim of the LBC1936 study is to investigate how people's thinking and memory skills (their cognitive abilities) change as they age: why do some people experience changes over time while others do not?; what factors predict these changes? Our work in the LBC1936 study is part of a larger research project known as The Disconnected Mind (funded by Age UK). The project will help us to learn more about how changes in the brain's white

matter – the wiring that connects different parts of the brain – might account for some of the changes seen in a person's thinking skills.

The third wave of cognitive and medical tests is well underway. In fact, by the end of the year we will have seen over 450 of you again. These repeat assessments are very important as they allow us to examine how your thinking skills are changing, or staying stable, over a number of years. The repeat brain scanning is also going well, and almost 300 people have had their second scan. You may remember that the first time you had the scan we told you that you were taking part in one of the largest studies of its kind, anywhere in the world. By repeating these scans, you are adding to this unique research project. It will allow us to provide insights about the ageing brain for many years to come.

To those of you who have already been to see us again, many thanks. We expect to complete the current wave of assessments by autumn of next year. If you haven't already been contacted to take part, you needn't do anything just now. We will be in touch over the next year and look forward to seeing you. However, if you have moved house, or are about to do so, please do update your address so we are able to keep in touch. Details of how to contact us can be found at the end of the newsletter.

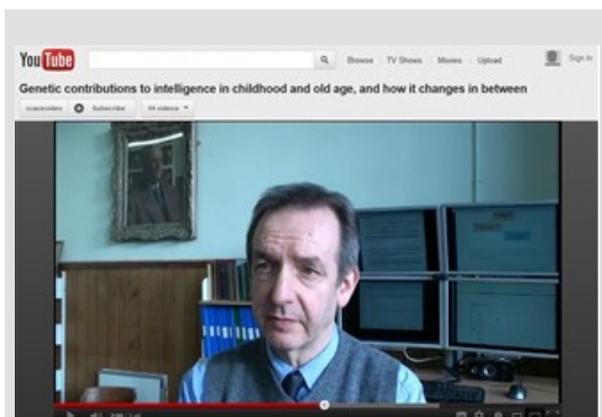
### **Latest results**

Because of the very detailed information you have provided us with for over six years, the number of scientific publications we produce continues to rise. 2012 has been no exception. Just three of the many findings from this year are summarised below, followed by a selected list of the scientific papers from throughout the year at the end of the

newsletter. You have directly contributed to all of them; we hope you are interested to read about these latest results.

We particularly note a publication in *Nature*—the world’s top scientific journal—from January. In order to understand the degree to which cognitive change can be influenced in old age, it is important to know how much of that change is genetic and how much is environmental. In this study, analysis of data from three cohorts including the LBC1936 indicated that about 25% of cognitive change throughout life is linked to genes. This was the first study ever to quantify by genetic analysis the extent to which genes influence changes in intelligence from childhood to old age. It follows that environmental factors account for around 75% of cognitive change across the lifecourse – and are therefore extremely important influences. We are working to identify what environmental factors are involved. Ultimately, modification of those that prove to be risk factors for cognitive impairment in later life will help people to protect their thinking skills in the future.

If you are interested in accessing the full



If you want to hear Professor Ian Deary describing the *Nature* paper, you can view a video on YouTube at: [http://www.youtube.com/watch?v=hCKXDzX1na0&feature=player\\_embedded](http://www.youtube.com/watch?v=hCKXDzX1na0&feature=player_embedded)

research paper, the reference is given below, or you can contact the research team to obtain a copy.

Deary, I. J. et al. (2012). Genetic contributions to stability and change in intelligence from childhood to old age. *Nature*, 482, 212-215.

Another of the interesting findings from this year examined the links between the health of the brain’s connective wiring and thinking skills. Dr Lars Penke, who led on the analysis, reported that people with robust white matter – the fibres that connect different brain regions – were able to process information more quickly and that this was associated with better performance on tests of general intelligence. Deterioration of white matter with age is likely to be a significant cause of age-related cognitive decline.

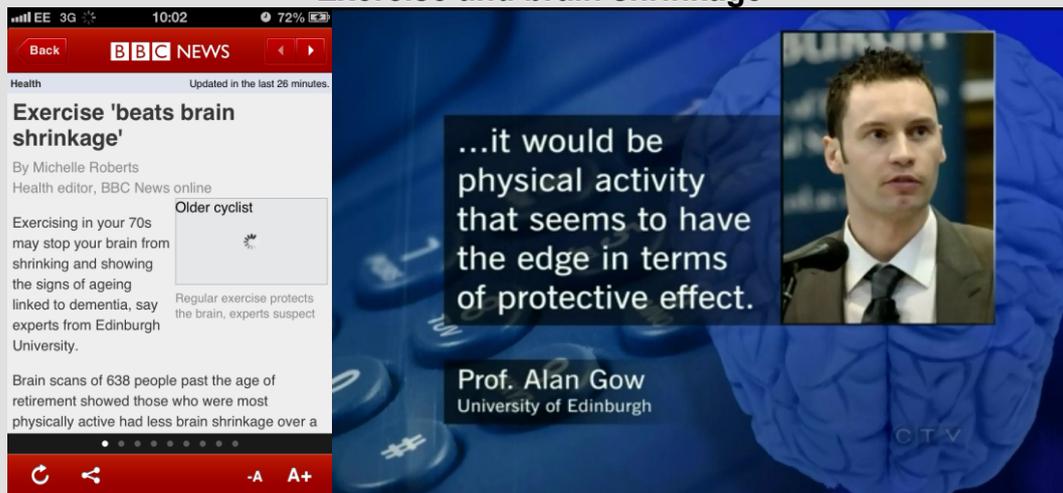
Professor James Goodwin, Head of Research at Age UK, said of the results, “This research is very exciting as it could have a real impact on tackling mental decline in later life, including dementia. With new understanding on how the brain functions we can work out why mental faculties decline with age in some people and not others and look at what can be done to improve our minds’ chances of ageing better.”

The paper was highlighted in a number of media reports, including The Times: <http://www.thetimes.co.uk/tto/science/biology/article3423245.ece>. The full reference is:

Penke, L. et al. (2012). Brain white matter tract integrity as a neural foundation for general intelligence. *Molecular Psychiatry*, 17, 1026–1030.

Finally in our round-up of new publications from 2012, the team reported that individuals taking more physical activity when aged 70 had better brain health (less shrinkage and less damage to the white matter) three years later. The

## Exercise and brain shrinkage



The results examining the association between exercise and brain health were reported internationally, including by BBC News (left) and Canadian TV news.

publication attracted media attention in the UK and internationally, with outlets covering the story including the Wall Street Journal and the Scottish Daily Mail. Professor Joanna Wardlaw and Dr Alan Gow also gave separate interviews to BBC Radio Scotland. The associated online piece was the most shared BBC News article for two days (<http://www.bbc.co.uk/news/health-20026099>). The full reference is:

Gow, A. J. et al. (2012).

Neuroprotective lifestyles and the aging brain: Activity, atrophy, and white matter integrity. *Neurology*, 79, 1802-1808.

If you would like to ask questions about, or obtain a copy of the papers listed above, or in the list at the end of this newsletter, we would be delighted to hear from you!

### Your stories

We have started an exciting new collaboration with the author Ann Lingard ([www.annlingard.org](http://www.annlingard.org)). Ann has been working with the LBC team and participants to write about their lives and experience of the LBC studies. The short stories will be compiled and published online and may develop into a small

publication about the studies.

On starting the project, Ann said, "I have just met three of the volunteer participants from the LBC1921 and 1936 groups - and have been enchanted by their humour, their generosity with their time, and by the stories they have told me about their lives... I 'shadowed' one of the 1936 cohort volunteers through his test sessions at the WTCRF (of course with his consent) and was very impressed at the range of tests he participated in, not least because of the length of the whole session and the concentration required".

As well as these written life stories, the team are also currently collaborating with the renowned artist Fionna Carlisle on a project in which she is painting and drawing portraits of the LBC research team and participants. The plan is for this to be a public exhibition in Edinburgh and perhaps in Age UK's London building. As the two exciting projects develop we will update you in future newsletters.

### Spreading the word

Throughout 2012, the LBC1936 team have continued to report the latest results coming from the study at international

meetings and conferences. In addition, earlier this year saw Age UK's official launch of the fundraising effort for the current phase of assessments. Study Director Professor Ian Deary accompanied by Dr Martha Pollard and one of the LBC1936 participants, travelled to London for the launch. They met current supporters and potential new donors to tell them more about the study, and the plans for the coming years.

Earlier in the year, Ian also met with David Willetts MP, the Minister of State for Universities and Science. The Minister had seen the *Nature* paper on the genetic and environmental contributions to lifetime cognitive change and wanted to know more, especially the implications for policy. Ian was able to speak with Mr Willetts for well over his allotted time, updating him on our latest work within the LBC studies.

In July, one of the LBC1936 participants was our representative at the All-Party Parliamentary Group on Medical Research Summer Reception in the Members Dining Room at the House of Commons in London. This very special occasion was this year entitled: 'How data saves lives – unlocking the research potential of information'. A number of research projects that have unusual data and are therefore highly valuable with respect to medical research were chosen to present posters at the meeting.

Ian said, "There was a huge amount of interest in our work. It was a valuable and enjoyable afternoon. At one point, of the many members of the House of Lords who came to ask about the Lothian Birth Cohort 1936, I was speaking to Lord Walton of Detchant, the distinguished neurologist. Like other members of the Lords he was interested and very well informed about medical research. He was impressed by the contribution that the LBC1936 members are making."

In July, Ian also spoke at a sell-out Royal Society of Arts event called 'The Long Run: Life is a Marathon'. The format was a series of presentations, followed by a discussion prompted by questions from the audience. Ian talked about the work being done on the LBC1921 and LBC1936 studies, with an emphasis on what can be done across the lifecourse in order to promote mental and physical health. Ian said, "It was a real challenge to boil down over 100 scientific papers into eight minutes but it did not prove impossible!"

The event was held to anticipate the start of the Olympic Games, and the final speaker was Simon Mason, an Olympic hockey player. The most evident things were the value of older people to society, and the great desire people have to know what might be done to promote better healthy ageing.

The LBC1936 study's latest findings were well-represented at summer conferences, with Dr René Möttus and Dr Tom Booth convening a symposium entitled "Transactions between personality traits, health related behaviours and health" at the European Conference on Personality, held in Trieste, Italy. At the same meeting, Dr Lars Penke was awarded an Early Achievement Award. The latest LBC1936 results were also presented at the World Congress on Active Ageing held in Glasgow. The full hall heard from Ian, Mrs Janie Corley, Dr Alan Gow and Dr Mark Bastin. The emphasis was on the practical implications for older people.

The brain imaging team's current analyses were also widely reported, with Dr Maria Valdés Hernández and Dr Benjamin Aribisala taking these to international meetings. Ben's presentation looked at associations between level and change in fitness and brain atrophy. We'll summarise those findings in the next newsletter.

## Very important engagements



Clockwise from top left: Ian Deary discussing his cunning plans with actor and presenter Tony Robinson at Age UK's fundraising launch; LBC1936 participant Mrs Sheila McGowan with her local MP at the All-Party Parliamentary Group on Medical Research Summer Reception. Photo courtesy of Wellcome Images; Ian with Olympian Simon Mason at the RSA 'The Long Run' event; and Dr Tom Booth sharing some of the latest LBC1936 findings at an international conference during the summer.

### Staff news

With a large research project, there are always some comings and goings. This year, we bid farewell to three of our colleagues. Dr Martha Pollard is now pursuing opportunities to work with older people in the voluntary and charitable sector. In autumn, Catherine Murray took up a Health Psychology position with NHS Lanarkshire. And from January, Dr Alan Gow will be taking up a lectureship at Heriot-Watt University, but will continue to collaborate with the team. The departees will be missed, both by the

team and the participants.

Simon Cox has very ably stepped into Martha's post as LBC1936 Study Co-ordinator having recently submitted his PhD (with his viva examination just before Christmas!). Simon is already known to some of you as he analysed brain imaging data collected during the previous assessment of the LBC1936, in addition to retesting a subsample of 90 participants for his PhD. His study was aimed at understanding the link between cortisol, a hormone that the body

produces naturally, and the structure and function of different parts of the brain.

Adele Taylor also joined the team, taking over from Catherine. Many of you have already become acquainted with Adele over the phone during your appointment booking, and she is looking forward to seeing many more of you at the clinic over the coming year.

### And finally...

You may be interested to know that the participants of the LBC1921, the sister study of the LBC1936, completed their fourth assessments at the start of this year. They were first recruited when aged 79, and have been seen at ages 83, 87 and now 90. The plan was to retest at least '100 at 90', and Ian was delighted when Mrs Alison Pattie surpassed that target by about 25%!

### Thanks again

By continuing to participate in the LBC1936 you are helping us understand more about how our thinking skills change over time, and the factors that might slow these changes. Thank you, from all of the LBC1936 research team. We look forward to seeing you in 2013 and beyond.

**Merry Christmas, and best wishes for a happy New Year.**

Yours sincerely,



**Professor Ian J. Deary,**  
Study Director;  
**Mrs Janie Corley,**  
**Mrs Alison Pattie,**  
**Miss Adele Taylor**  
Research Associates;  
**Mr Paul Redmond,**  
Database Manager;  
**Dr Alan Gow,**  
Senior Research Fellow;  
**Mr Simon Cox,**  
Study Co-ordinator.

### Would you like to talk to us?

You can contact us at:



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EH8 9JZ.

Telephone: 0131 651 1681

(Adele Taylor)

Email: [lbc1936@ed.ac.uk](mailto:lbc1936@ed.ac.uk)

Do, please, let us know if there is any change to your address.

**[www.lothianbirthcohort.ed.ac.uk](http://www.lothianbirthcohort.ed.ac.uk)**

### Research publications

The full references for some of the most recent research publications from 2012 are given below. Please get in touch if you would like a copy of any of these articles.

- Corley et al. (2012). Smoking, childhood IQ, and cognitive function in old age. *Journal of Psychosomatic Research*, 73, 132-138.
- Gow et al. (2012). Reverse causation in activity-cognitive ability associations: the Lothian Birth Cohort 1936. *Psychology and Aging*, 27, 250-255.
- Johnson et al. (2012). Can we spot deleterious ageing in two waves of data? The Lothian Birth Cohort 1936 from ages 70 to 73. *Longitudinal and Life Course Studies*, 3, 312-331.
- Lopez et al. (2012). A genome-wide search for genetic influences and biological pathways related to the brain's white matter integrity. *Neurobiology of Aging*, 33, 1847.
- Luciano et al. (2012). Genome-wide association uncovers shared genetic effects among personality traits and mood states. *American Journal of Medical Genetics: Neuropsychiatric Genetics*, 159B, 684-695.
- Penke et al. (2012). Brain iron deposits are associated cognitive ability and cognitive aging. *Neurobiology of Aging*, 33, 501-517.