



### Members of the Cam-CAN Cohort: *Who are you?*

*by Fiona Matthews & Meredith Shafto*

By agreeing to participate in the Cam-CAN project you have taken us a step closer to understanding how we can maintain good neural, cognitive, and physical health across our adult life. We have now come to the end of the cohort recruitment. So...**who are you?** Read on to find out about the Cam-CAN Cohort.

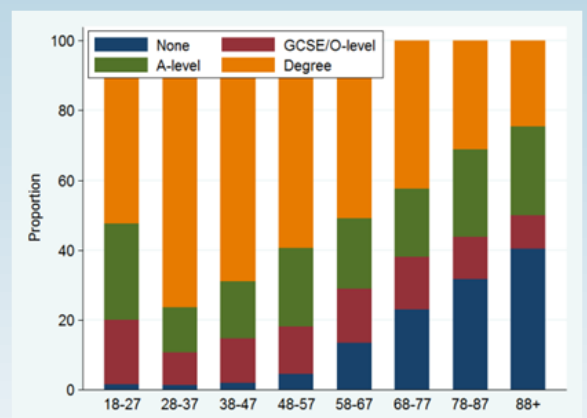
The Cam-CAN Cohort is made up of a diverse group of 2655 people aged 18 and over who are from all walks of life. Although candidates were collected randomly from 13 different GP surgeries all over Cambridge, we selected approximately equal numbers of people at each age, and equal numbers of men and women.

Because this dataset is very rich, we will be kept busy understanding the data our participants supply for years to come! However, even now we can identify some interesting patterns that tell us about the range of adults in the Cambridge City community.

#### Changing generations, changing lifestyles

One well-known change has been the increase in educational attainment in younger generations. We see this in the Cam-CAN cohort, with higher levels of degree attainment in the younger groups. High degree attainment also reflects Cambridge's status as a high tech community, with influxes of people joining both academic and technology developments across the city.

We also find that messages about the dangers of smoking have been heeded over the whole population. Although the largest percentage of current smokers are our youngest participants, fewer have ever started than in earlier generations.



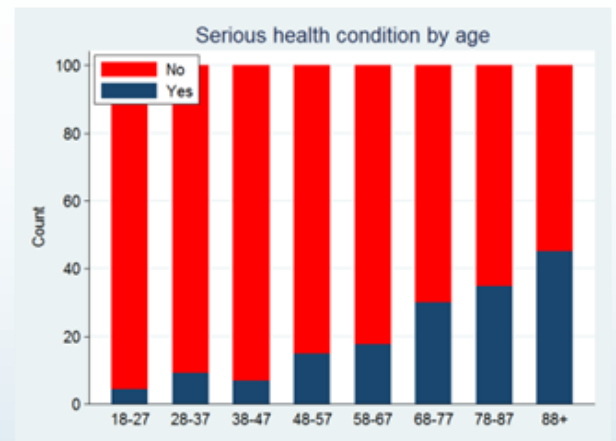
*Cam-CAN data showing the relationship between age group and educational attainment*

#### Does education always help you avoid bad habits?

While most Cambridge residents forgo smoking, we're drinking alcohol regularly, with 60% of us drinking alcohol at least once a month. While higher levels of education appear to be related to lower levels of smoking, degree-holders have higher rates of regular drinking.

## How do you feel? Self-reported health isn't always a numbers game

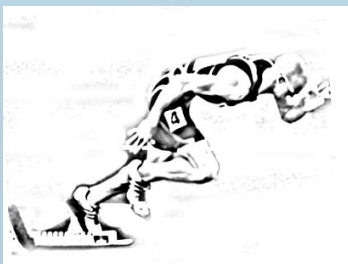
We asked you questions both about serious medical conditions that you have and also questions about how you perceive your health for your age. While it is true that the prevalence of serious health problems is highest in the oldest adults, we can see that this isn't exclusively a problem of old age. Moreover, people with serious health problems did not always rate their own health as "poor" with many people rating their health as "good" or even "excellent".



## What are we doing with your information, and why did we ask so many questions?

The major aim of the Cam-CAN project is to understand how we can maintain good cognitive functions across the adult lifespan, and we know that answering this question is likely to reflect a complex set of relationships between a person's genetics, lifestyle, and brain function. As you can see from the examples above, key variables like smoking may impact health, but may also have complex relationships with other background factors like education. The relationships are not always obvious or expected, and teasing apart these complex patterns we hope will result in guidance we all can use to maintain good function across our lifespan.

In addition to our broad scientific goals, we expect that the data supplied by you and the rest of the Cam-CAN Cohort will help inform local health programmes. Your data are always kept anonymous, but we will be able to feed back patterns of responses to GP surgeries, to inform on issues such as whether interventions into smoking and drinking can be improved.



## Speed is of the essence

by James Rowe

From driving safely and avoiding falling objects, to video games and the racetrack, we sometimes have to react quickly to things we see and hear. It can take just a fraction of a second. You usually know whether you reacted in time or not, but most of us are not very aware of how quickly we can react.

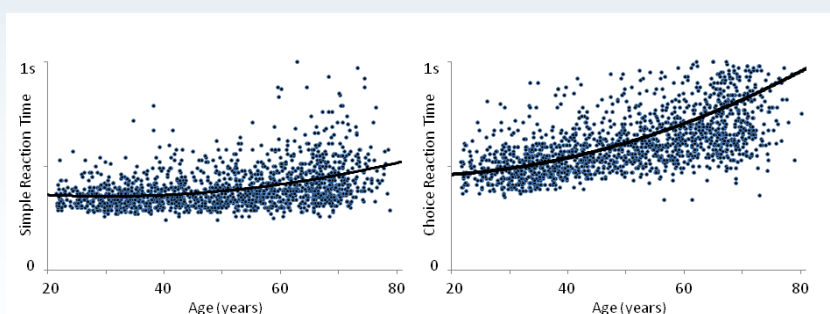
Reaction times have been very important in psychology studies for a hundred years, and remain an important test in the Cam-CAN study of healthy ageing. Even a simple reaction time test, such as pressing a button when a picture appears on a screen, can be used to measure the speed of brain processing – the speed with which the brain processes the vision coming in, interprets the meaning of what is seen, and makes a response. One can make the tests more complicated, for example by asking people to make a choice between different possible actions.

The simple reaction time varies a lot from person to person. The left graph shows each person in Cam-CAN as a blue dot, with their reaction time plotted against age. For people up to the age of 50, the average simple reaction time changes little, at about a third of a second. After 50, the average begins to increase, as shown by the black line. However, notice how the spread, or range, of reaction times increases – the 'cloud' of dots gets broader, with some older people keeping a short reaction time, while others slow right down. The change in the reaction times for choices is different. In the right graph, notice how the choice reaction time is not only slower (about half a second in young adults), but also increases markedly from the start (to about a second by the age of 80).

Over the life span, reaction times are closely related to the changes in other, more complicated tests, such as those looking at fluid intelligence or working memory. We can now start to look at how changes in these more complicated tests of brain function over the lifespan are affected by changes in the reaction time.

By looking at the changes in the brain that match the changes in reaction time, we can also learn a lot about what makes some people resilient to the effects of age, staying 'mentally young' despite increasing years.

So, next time you have to slam on the brakes when driving, or win 'whack-the-rat' at the fete, congratulate yourself on your fast reaction times and think about how well your brain automatically does this most useful job.







## Understanding how our emotional experience changes as we get older

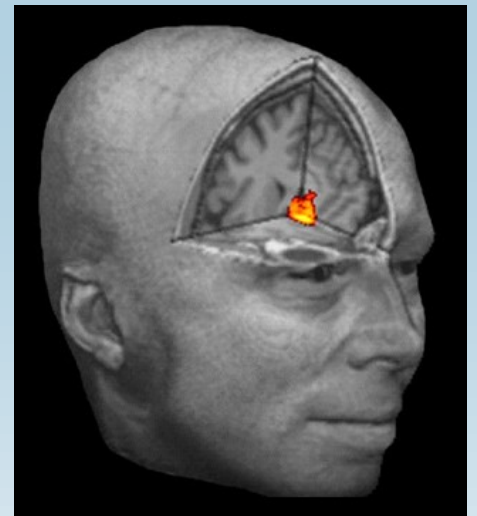
by Tim Dalgleish

One of the unique strengths of the Cam-CAN study is its broad focus across all domains of mental life – attention, memory, language, motor control, planning, reasoning, thinking, and of course emotions. We currently know little about how our capacity to experience emotions, and perhaps more importantly,

our capacity to regulate and control our unwanted emotions, changes with age. We know even less about how these changes are reflected in alterations in the way the brain processes emotions as we get older. By evaluating how our participants across the age range experience and regulate their emotions, Cam-CAN will be able to shed light on these important issues.

Emotions are a critical part of our mental machinery. They provide us with rapid feedback about the situations we encounter in the world that is difficult to ignore. Emotions help the mind and brain reconfigure itself very quickly to deal with important novel situations that we need to respond to, offering a faster alternative to slower processes of rational analysis and reasoning. Our emotions are strongly grounded in the past, however. They provide us with feedback about new experiences based on what our old experiences in similar situations have told us. This means that sometimes our emotional reactions to a situation, driven by our past, can differ quite markedly from how we want to be responding to that situation in the here and now. When this happens, the challenge is to regulate and control this often powerful influence of our feelings, and to direct our minds towards our preferred ways of responding. This ability to regulate unwanted or inappropriate emotional imperatives varies tremendously across individuals and is very often compromised in those suffering from mental health problems. The ability to control our emotional experiences also appears to change markedly in early life, developing from the early years through to stability in young adulthood. What we know far less about is how emotion regulation capabilities continue to change and evolve through the working age years and into older adulthood and this represents one of the exciting challenges in the Cam-CAN project.

To investigate changes in emotional experiences and in our capacity to regulate them, the Cam-CAN team are asking participants to watch a set of film clips, depicting real-life footage of emotive events. Participants are asked to either allow their feelings to arise as naturally as possible to what they are viewing or to dampen down their feelings by trying to think about what they are viewing differently – the most common way in which we regulate unwanted emotions. We are also recording activity in the brain at the same time, using functional magnetic resonance imaging (fMRI). This can be a challenging task as some of the films are very emotional, so we are very grateful to all our participants. The results will allow us for the first time to look at how emotional reactions, our ability to control them, and the changes in the brain that accompany them, vary across the adult lifespan. These insights are likely to be very important in unlocking the secrets of mental well-being and mental ill health as we age.



*An fMRI image of activation in amygdala – a key brain region involved in emotional reactions and their regulation*

In this newsletter you've heard a little from some of our experts who work on Cam-CAN:



Dr Tim Dalgleish

Dr James Rowe



Dr Fiona Matthews

Dr Meredith Shafto



To learn more about our scientific team and their research interests visit the People page of our website at <http://www.cam-can.com/people>

# Cam-CAN team updates

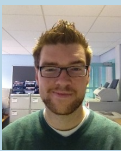
## Welcome to.....



Post-doctoral researcher: Linda Geerligs joined us in September 2013. Her role is to contribute to the analyses and understanding of data collected to date, and assist with further data collection.



Research Assistants: Stanimira Georgieva was welcomed to our team in late 2012 and David Troy joined us in August 2013. Both help to run the MRI, MEG and lab-based sessions at the MRC-CBU.

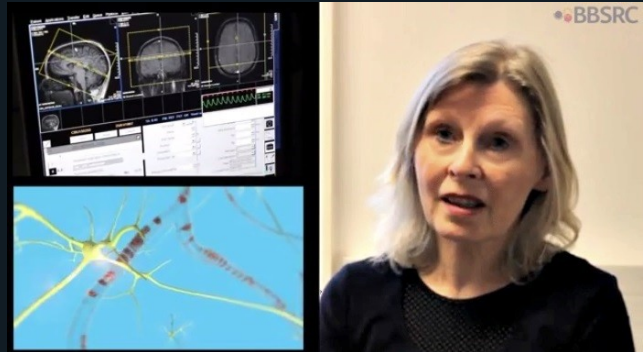


Administrator Dan Barnes replaces Jaya Hillman in the project administration office. He is available to help with any queries you may have about the project.

## And goodbye to....

We bid a sad farewell to a number of team members who have left us this year including the many Research Interviewers and our Epidemiology Research Co-ordinator Jo Mitchell, who all worked so hard to complete the initial recruitment and interview stage of the project; Research Assistants Sofia Gerbase, Lauren Bates and Sharon Erzinçlioğlu who completed an enormous number of testing sessions at the MRC-CBU; and post-doctoral researchers Teresa Cheung, Anna McCarrey and Jason Taylor. In the central office our administrative assistant Jaya Hillman has left to train as a teacher.

# Cam-CAN in motion



The BBSRC, generous funders of the Cam-CAN project, visited Cambridge in early 2013 to film the mid-stage of the project, as we collected MRI, MEG and cognitive behavioural data from a sub-set of participants.

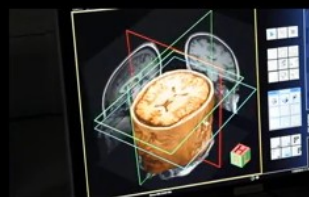
The footage has been turned into a suite of five films and made available to the public via the BBSRC and Cam-CAN websites as well as YouTube. Watch the videos yourself at:

<http://www.cam-can.com/news/>

There may be some tasks and faces you recognise.



## How does the brain change with age?



*Images courtesy of the BBSRC*

## Thank you for taking part and please do keep in touch...

We are very grateful for your participation in the Cam-CAN project and for the time you have generously given us. Your contribution to our research is invaluable - we really couldn't do it without you! We hope that you are interested in future stages of the research and are willing to continue your participation.

So that we can keep in touch, please let us know if you have recently changed your contact details or if you have any questions about the research. You can contact us on:

Tel: 01223 766458 or 764414, Fax: 01223 766452

E-mail: [admin@cam-can.com](mailto:admin@cam-can.com), [www.cam-can.com](http://www.cam-can.com)

Cam-CAN, Department of Psychology, University of Cambridge, Downing Street, Cambridge, CB2 3EB.

*Thank you*