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## A window on the brain

**Wednesday 14 March 2012  
6.00 - 8.30pm**

Medical Research Council  
Cognition and Brain Sciences Unit  
15 Chaucer Road  
Cambridge CB2 7EF  
Tel: 01223 355294

**A free event organised as part of the Cambridge Science Festival**

### PROGRAMME

**6-7pm**

#### **Arrival**

For the first hour, there will be practical demonstrations of experiments for you to try out, and lots of other hands-on activities with many of our scientists on hand to explain their work.

Light refreshments (tea/sandwiches) will be served.

*7pm*

*Demonstrations close and our three talks begin in the Lecture Theatre*

**7-7.30pm**

#### **Working memory and classroom learning**

***Speaker: Susan Gathercole, Director of the CBSU***

In April 2011 Professor Gathercole became the Director of the Cognition and Brain Sciences Unit and was appointed a Professor of Psychology at the University of Cambridge. For the past thirty years, her research has focussed on memory, language, learning and other cognitive processes in both typical children and in children with developmental and acquired disorders of learning. Her current research focuses on the cognitive and neural basis of working memory problems in children and in adults with hypertension, and on the development of intervention methods to alleviate the everyday consequences of these cognitive deficits. Tonight she will talk about her past work and plans for her new programme at the Unit.

**7.30-8pm      Connections of the brain in health and disease**

***Speaker: Charlotte Rae***

The white matter connections are the super-highways of the brain, carrying nerve impulses at high speed between brain areas. With a new type of MRI technique, called diffusion imaging, we are able to investigate white matter connections in the brains of living people, with only a short MRI scan. Research using diffusion imaging has found that musicians have increased connections to their motor cortex, that learning to juggle can change the connections in your visual areas, and that the connections between language areas have evolved dramatically in humans compared to chimpanzees. At the CBU, our recent research has used diffusion imaging to investigate the white matter connections in patients with Parkinson's disease. We have found that the connections of the prefrontal cortex are markedly different between Parkinson's patients and controls, even at an early stage of the disease, and that this may be related to their difficulties in complex behavioural control. Our future work will combine diffusion imaging with functional MRI to investigate how the structure of participants' white matter connections can impact upon their brain activity.

**8-8.30pm      Speech perception and the brain: Transforming sound into language**

***Speaker: Ediz Sohoglu***

Understanding spoken language is arguably the finest achievement of the human brain. Our voices contain a rich set of information not only about the message we are trying to convey but also about who we are (from our accent), our sex and size (from the pitch of our voice), and whether we are happy or sad. All this information reaches our ears as abstract sound waves, and somehow, is transformed by our brains into something we understand. How does the brain do this? And what happens when speech is difficult to understand if you have a hearing impairment or encounter a foreign speaker with a novel accent? Join me in exploring these questions as we find out about speech perception and the brain.

*We hope you enjoy the evening. If you would like to help us with our research by becoming a member of our Volunteer Panel, please contact our Panel Manager, either at the address above, by email to [panel@mrc-cbu.cam.ac.uk](mailto:panel@mrc-cbu.cam.ac.uk), or you can speak to us on the night.*