

Brain to behaviour

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How do you know where your keys are? Why do we develop habits and what influences our judgement? Throughout the Cardiff University, psychologists, behavioural geneticists and neurologists are working together to understand the fundamental mechanisms of learning and memory. Their work has implications for understanding brain function and changes as well as giving vital insight into neurological conditions such as Alzheimer's disease and schizophrenia.

One of those at the forefront of this research is Professor John Pearce FRS of the School of Psychology. Internationally recognised for his contribution to the study of associative [learning](#) and conditioning in animals, Professor Pearce is currently using a novel new technique to explore where animals will direct their attention when they are learning about changes in their environment. Much of his current research is focused on homing pigeons, whose remarkable vision makes them ideal for studying changes in attention during complex learning tasks.

"The term 'bird brained' is a bit of a misnomer. At least in some respect, pigeons display considerable intelligence," says Professor Pearce. "For example, they are capable of remembering hundreds of different photographs, and of forming something akin to concepts. The experiments in our test chambers are revealing, not surprisingly, that pigeons attend to stimuli that signal the delivery of important events such as food or water, but they also pay attention when they can't work out what a stimulus is signalling."

The main purpose of Professor Pearce's research is to identify a general

set of principles specifying where an animal will direct its attention. Once these principles are clear he intends to identify the [neural mechanisms](#) responsible for changes in attention.

In a separate study, Cardiff academics are investigating how people remember information. What if, whenever you tried to remember where you had left your keys, every place you had ever left your keys came to mind?

In order to remember something, people need to recall the relevant information, but it is just as important to avoid recalling irrelevant information.

Using a combination of brain imaging techniques to track changes in neural activity in real time, Dr Ed Wilding, School of Psychology, has explored how successful remembering involves recalling some kinds of information whilst inhibiting others.

“We have shown that people automatically inhibit irrelevant information when trying to remember, and how well you can inhibit irrelevant information predicts how good your [memory](#) is,” says Wilding. “We now have a clearer idea of the roles that inhibition plays in memory retrieval. This is important for understanding why memory abilities can decline with increasing age, because our capacity for inhibition also declines as we get older.”

Provided by Cardiff University

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