

Brain scans pinpoint how chocoholics are hooked

August 27, 2007

Chocoholics really do have chocolate on the brain. Their grey matter reacts differently when they see or taste chocolate than people who do not crave the food.

British researchers used brain scans to investigate subconscious reactions to the confection and found that the pleasure centers of chocolate lovers' brains lit up more strongly in response to the food than those who are less partial.

There may also be some truth in calling the love of chocolate an addiction in some people. When cravers viewed pictures of chocolate this activated regions of the brain known to be involved in habit-forming behaviors and drug addiction.

Edmund Rolls and Ciara McCabe at the University of Oxford's experimental psychology department used functional magnetic resonance imaging to scan the brains of eight chocoholics and eight non-cravers. All the volunteers were women. The technique reveals where activity is happening in the brain.

The volunteers were presented first with appetizing pictures of chocolate bars, before being allowed also to taste liquid chocolate fed to them through a tube in the confined space of the scanner.

As expected the cravers consistently rated the experience as more pleasant, but their brains also reacted differently. Three regions thought to be important in pleasure sensation and addictive behavior - the orbitofrontal cortex, the ventral striatum and the cingulate cortex - were all more active in the chocolate fanciers. "We can tell what people will like from their brain response," said Prof Rolls. The findings are published this month in the *European Journal of Neuroscience*.

The study also found that combining the sight and taste of chocolate produced a stronger reaction in both cravers and non-cravers, than either separately. Prof Rolls said this suggests that seeing the food we eat plays a key role in enjoying its taste.

"Sight and flavor combined give a much bigger response than seeing or tasting the food separately. The sight component is important and complements the flavor," he said.

This finding might offer a way of making food less pleasurable for people on a diet. "The take-home message is that if you want to limit [food] intake, you could limit the extent to which you are exposed to the combination of sight and taste. For example, you could eat in the dark", he said. This is an "exact parallel" with the experience of eating food when you cannot smell anything - for example if you have a blocked nose, he said