

Research indicates food craving is 'hard-wired' in the brain

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Credit: Peter Häger/Public Domain

An international group of researchers have found that food craving activates different brain networks between obese and normal weight patients. This indicates that the tendency to want food may be 'hard-wired' into the brain of overweight patients, becoming a functional brain biomarker.

Obesity is one of the most difficult problems facing modern society. Treating obesity is a health priority, but most efforts (aside from bariatric surgery) have met with little success. In part, this is because the mechanisms associated with the desire to eat are poorly understood. Recently, studies are beginning to suggest that the brain mechanisms underlying obesity may be similar to those in substance addiction, and that treatment methodologies may be approached in the same way as other substance addictions, such as alcohol or drug addiction.

To test this, a group of researchers in the University of Granada, Spain, and Monash University in Australia, have looked for the functional connectivity differences in brain reward systems of [normal-weight](#) and obese individuals.

The researchers gave buffet-style food to 39 obese and 42 normal-weight individuals. Later, they were put into functional MRI brain scanners and shown photographs of the food to stimulate food craving. The functional MRI scans showed that food craving was associated with different brain connectivity, depending on whether the subject was normal-weight or overweight.

They found that in obese individuals, the stimulus from food craving was associated with a greater connectivity between the dorsal caudate and the somatosensory cortex, implicated in reward-based habits and the coding of the energetic value of foods, respectively. However, with normal weight individuals, food craving was associated with a greater connectivity between different parts of the brain - e.g. between the ventral putamen and the orbitofrontal cortex.

The researchers then measured Body Mass Index (BMI) three months afterwards and found that 11% of the weight gain in the [obese individuals](#) could be predicted by the presence of the increased connectivity between the dorsal caudate and the somatosensory cortex

areas of the brain.

According to lead researcher, Oren Contreras-Rodríguez:

"There is an ongoing controversy over whether obesity can be called a "food addiction", but in fact there is very little research which shows whether or not this might be true. The findings in our study support the idea that the reward processing following food stimuli in obesity is associated with neural changes similar to those found in substance addiction.

This still needs to be viewed as an association between food craving behaviour and brain changes, rather than one necessarily causing the other. However, these findings provide potential brain biomarkers which we can use to help manage [obesity](#), for example through pharmacotherapies and [brain](#) stimulation techniques that might help control food intake in clinical situations".

More information: Abstract: P.1.i.033 Brain correlates of the desire to food predict body mass index change in excess weight adults

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