

New research shows dieting success may be hardwired into the brain

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A new research paper, by Chen et al in Cognitive Neuroscience, studied the connections between the executive control and reward systems in the brain, and discovered the ability to self-regulate a healthy body weight may be dependent on individual brain structure.

Obesity and dieting are increasingly common in contemporary society, and many dieters struggle to lose [excess weight](#). A new research paper, by Chen et al in Cognitive Neuroscience, studied the connections between the executive control and reward systems in the brain, and discovered the ability to self-regulate a healthy body weight may be dependent on individual brain structure. The findings show that dieting success may be easier for some people because they have an improved white matter pathway connecting the executive control and reward systems in their brain.

Chronic dieters are known to show excessive reactions to food cues in executive control and reward areas of the brain, in addition to having depleted cognitive control and over-rewarding with [high calorie foods](#) in real life situations. Chen et al took a group of thirty six chronic dieters, with mean body fat of 29.6%, and asked them to make simple judgements on images in order to divert their attention from the real aim of the task. The activity carried out was a food cue reactivity task designed to localise the executive control and reward areas in the brain, using functional magnetic resonance imaging (fMRI). After localizing the executive control and reward areas, Chen et al used diffusion tensor imaging (DTI) to identify the white matter track connecting these areas

in order to quantify the integrity within this tract.

The fMRI results demonstrated that dieters showed greater reactivity to food images than control images. The DTI results further showed that those with lower body fat percentages showed greater white matter integrity between executive control and reward areas of the brain. The findings support their hypothesis that structural integrity connecting the two centres relates to individual differences in body fat and is an indication of dieting success. The authors state, "Individuals with reduced integrity may have difficulty in overriding rewarding temptations, leading to a greater chance of becoming obese than those with higher structural integrity."

The authors urge future continued longitudinal research to establish whether repetitive dieting in itself could cause alteration in white matter integrity, exacerbate the executive control and reward communications and result in more entrenched obesity for the individual.

More information: Pin-Hao Andy Chen et al. Structural integrity between executive control and reward regions of the brain predicts body fat percentage in chronic dieters, *Cognitive Neuroscience* (2016). [DOI: 10.1080/17588928.2016.1235556](https://doi.org/10.1080/17588928.2016.1235556)

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