MedicalXpress

You want fries with that? Don't go there

November 11 2013

A new Dartmouth neuroimaging study suggests chronic dieters overeat when the regions of their brain that balance impulsive behavior and self-control become disrupted, decreasing their capacity to resist temptation.

The findings, which appear in the journal *Psychological Science*, indicate that chronic dieters will have more success if they avoid situations that challenge their self-control. A PDF of the study is available on request.

The results shed new light on brain mechanisms involved in obesity, substance abuse and other impulsive health problems. Going forward, the Dartmouth researchers are looking into whether self-control can be strengthened over time – much like muscles are strengthened through exercise and rest—by routinely resisting minor temptations, says Professor Todd Heatherton, the study's senior author and a pioneer in social neuroscience, or the study of links between brain processes and social behavior.

Previous studies suggest that people have a limited amount of self-control that dwindles when used to cope with stress, temptation and other challenges to our will power, leaving us vulnerable to impulsive and undesirable behavior. A 2011 Dartmouth study suggested self-control fails when the strength of an impulse exceeds the capacity to regulate it.

In the new study, 31 women who were chronic dieters completed an attention-control task that did or did not deplete their self-control. They then underwent functional magnetic resonance imaging (fMRI) while

viewing images of high-calorie appetizing food. The results showed the depleted dieters had greater activity in the orbitofrontal cortex, an area of the brain related to food rewards. They also had reduced connectivity between this area and the inferior frontal gyrus, a region implicated in self-control.

The findings suggest that such depletion reduces a person's ability to engage in self-control by reducing connectivity between brain regions that are involved in cognitive control and those that represent rewards, thereby decreasing the capacity to resist temptations.

Provided by Dartmouth College