

Study shows differences in brain activity between men and women who are obese

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A new study of obese people suggests that changes in their brains' reward regions make them more prone to overeating, and that women and men exhibit different brain activity related to overeating.

Researchers from UCLA found that women who are obese showed more prominent changes in the reward system related to [dopamine](#) responsiveness, suggesting that emotion-related and compulsive eating play a larger role in their overeating. Men who are obese showed a different pattern of [brain](#) remodeling in sensorimotor regions, a sign that their eating behavior is affected by a greater awareness of gut sensations and visceral responses.

Stress and drug use are known to affect how sex and sex hormones modulate the function of the mesolimbic dopamine system, which is involved in the reward system in the brain. It's possible that these factors lead to reduced [dopamine signaling](#), according to research. Past studies have also demonstrated how altered processing of rewarding stimuli results in excessive eating. These new findings show that obesity has similar types of effects on the mesolimbic dopamine system.

The researchers collected brain images from 124 individuals (61 males and 63 females) who did not have significant medical or psychiatric conditions. They then calculated how the brain's reward, sensorimotor, and salience—the brain's way of making appropriate responses based on biological and cognitive stimuli—networks are related to information flow. The individuals were divided into four groups based on their [body mass index](#) and sex: males with high BMI, males with normal BMI, females with high BMI and females with normal BMI.

A person's sex has not been sufficiently considered as a factor when it comes to devising a plan for treatment of obesity, according to the study's authors. This research is the first to examine sex-related differences in characterizing the prominence and signaling of brain regions in obesity. A better understanding of sex differences in [obesity](#) may allow medical professionals to more precisely tailor individual treatments.

The study was published online in the *International Journal of Obesity*.

More information: A Gupta et al. Sex differences in the influence of body mass index on anatomical architecture of brain networks, *International Journal of Obesity* (2017). [DOI: 10.1038/ijo.2017.86](https://doi.org/10.1038/ijo.2017.86)

Provided by University of California, Los Angeles

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