

Under stress, brains of bulimics respond differently to food

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Credit: Jm Verastigue/public domain

Magnetic resonance imaging scans suggest that the brains of women with bulimia nervosa react differently to images of food after stressful events than the brains of women without bulimia, according to research published by the American Psychological Association.

In women with [bulimia](#), the researchers found decreased blood flow in a

part of the brain associated with self-reflection, compared with increased blood flow in women without bulimia. This suggests that bulimics may be using [food](#) to avoid negative thoughts about themselves, the researchers said.

"To our knowledge, the current study is the first investigation of the neural reactions to food cues following a stressful event in women with bulimia nervosa," said lead author Brittany Collins, PhD, of the National Medical Center. The research was published in the *Journal of Abnormal Psychology*.

Stress is considered to be a trigger for binge-eating in patients with bulimia nervosa, but there is little research on how people with bulimia nervosa process and respond to food cues.

The researchers conducted two experiments. In the first, 10 women with bulimia and 10 without came to a lab where they all ate the same meal. After waiting for about an hour and becoming familiar with an MRI scanner, they then entered the scanner and were shown a series of neutral pictures, such as leaves or furniture, followed by a series of high fat/high sugar food pictures, such as ice cream, brownies, pizza or pasta with cheese sauce.

Participants were then asked to complete an impossible math problem, a task designed to induce [stress](#) and threaten their ego. They then re-entered the scanner and looked at different photos of high fat/high sugar foods. After every activity in the scanner, the women rated their levels of stress and food cravings.

"We found that everyone experienced increased stress after the stress task, and that everyone reported that stress went down after seeing the food cues again. Also, every time that participants saw the food cues, they reported that their craving for food went up," said co-author Sarah

Fischer, PhD, of George Mason University.

What was surprising was even though patterns of self-reported results were similar for both groups, the two groups showed very different brain responses on their MRI scans, Fischer said. For women with bulimia, blood flow to a region called the precuneus decreased. For women without the eating disorder, blood flow to this region increased. The precuneus is involved in thinking about the self.

"We would expect to see increased blood flow in this region when someone is engaged in self-reflection, rumination or self-criticism," said Fischer.

In the second experiment, the researchers asked 17 women with [bulimia nervosa](#) to complete the same task as the women in the first study, in order to examine whether the findings could be replicated in a different sample of women.

"Our results were the same in the second study," said Fischer. "Women reported increases in stress following the stress task and increases in food craving after seeing food cues. More important, blood flow to the same region, the precuneus, decreased when viewing food cues following stress."

Collins believes that this decreased [blood flow](#) in bulimics suggests that the introduction of food shuts down self-critical thinking in bulimics and gives them something to focus on instead of the painful prospect of dealing with their own shortcomings.

Psychologists have previously theorized that binge-eating provides bulimic women an alternate focus to negative thoughts about themselves that may be brought on by stress. This research provides support for this theory, according to Collins.

"Our findings are consistent with the characterization of binge-eating as an escape from self-awareness and support the emotion regulation theories that suggest that women with bulimia shift away from self-awareness because of [negative thoughts](#) regarding performance or social comparisons and shift focus to a more concrete stimulus, such as food," said Collins.

The results of these experiments could also suggest a neurobiological basis for the use of food as a distractor during periods of stress in [women](#) with the disorder, she said. The researchers called for further studies to confirm their results, which they termed preliminary.

The article is part of a special section of the July 2017 issue of the journal devoted to outstanding contributions by young investigators in the field of eating disorders.

"This issue is dedicated to highlighting the accomplishments of an impressive group of young researchers," wrote the section co-editors Pamela Keel, PhD, Florida State University, and Gregory Smith, PhD, University of Kentucky, in their introduction. "The papers offer a glimpse into the many and multifaceted forms of progress young researchers are making in the effort to understand and address an extraordinarily important form of psychopathology, dysfunction related to the basic need of food consumption."

More information: "The Impact of Acute Stress on the Neural Processing of Food Cues in Bulimia Nervosa: Replication in Two Samples," by Brittany Collins, PhD, National Medical Center; Jennifer McDowell, PhD, and L. Stephen Miller, PhD, University of Georgia; and Lauren Breithaupt, MA, James Thompson, PhD, and Sarah Fischer, PhD, George Mason University. *Journal of Abnormal Psychology*, published July 10, 2017.

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