Hunger and Satiety in Anorexia Nervosa: fMRI during Cognitive Processing of Food Pictures

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What is restricting anorexia nervosa (AN)?

DSM IV-TR Criteria:

- Refusal to maintain body weight at above a minimally normal body weight for one’s age and height

- Intense fear of gaining weight

- Disturbance in the way in which one’s weight is experienced or denial of seriousness of current low body weight

- Restricting type- rarely engage in binge eating or purging
Introduction

- Patients with eating disorders (AN and bulimia nervosa) relative to healthy people when viewing food pictures showed decreased activation in the inferior parietal lobe (IPL). Subjects were tested in a state intermediate between hunger and satiety

  (Uher et al., 2003, 2004)

- Relation of IPL and satiation

  (Tataranni et al., 1999)
Hypothesis

Satiated AN patients would show lower IPL activation to food stimuli than satiated HC (healthy control) subjects
Where is the inferior parietal lobe?

IPL = BA 40
Methods

Participants
- 13 female restricting type AN patients
- 10 female HC subjects

Procedure
- Two sessions at 8 AM. One with breakfast (satiated state) and one without food for past 12 hours (hungry state)
- Each session had 32 blocks, one block consisted of 10 consecutive food or non-food stimuli
- Used fMRI and measured the difference in activation between food and non-food using the BOLD signal
- Completed Three Factor Eating Questionnaire (TFEQ) to measure dietary restraint
Example of Food Stimuli
Results

- AN patients showed lower activation compared with HC subjects in the IPL when satiated.
- Least IPL activation in participants with lowest BMI

- Least dietary restraint by HC subjects, most by AN patients

*Note: Y axis= IPL activation using beta weights
Discussion

- IPL receives both somatosensory and gustatory projections from the insula which is the primary taste cortex (Yoshimura et al., 2004)

- Lower activation is related to a decrease in imagination of taste in response to the visual stimuli which may facilitate fasting.

- Higher IPL activation in obese subjects (Wang et al., 2002).
My Personal Opinion

Strengths

- Also investigated satiety and hunger on AN and HC for occipital cortex, prefrontal cortex, valence, and disinhibition

Limitations

- Effects of low-caloric food on brain activations in AN patients?
- Binge-eating-purging-type AN?
- 4 AN patients were taking SSRIs (Selective Serotonin Reuptake Inhibitors) to treat their depression
- Lack of male participants
References


