

Biological effects on hunger and satiation

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There is a theory called dual control theory that assumes that the feeling of hunger and satiation are controlled by two parts of the hypothalamus the lateral hypothalamus and the ventromedial hypothalamus. It is stated that the ventromedial hypothalamus is triggered by an increase in the glucose levels during eating, it then gives out the feeling of satiation (fullness) causing a person to stop eating. Whereas the decline in glucose level triggers the lateral hypothalamus which then gives out the feeling of hunger making the individual want to eat.

This theory is backed by a study conducted by Withering and Ranson (1942) who found that after creating lesions (damage) in a rat's VMH they found that the rat became obese and overate, thus showing the rat lost its feeling of satiety and had no holds on how much to eat. Another study done by Anderson and Broke (1951) showed that when the LH in rats was damaged or had a lesion it led to the loss of eating in the rat. The problem with these studies is that they are conducted on rats which begs the question are whether you can extrapolate the findings and generalise them on humans.

Although they are found to have a similar gene structure to humans, we are still two very different species and humans are a far more complex organism, with mood, feelings etc. Also both the studies are very old which questions their reliability, with far less knowledge about the brain in 1950 the study could have been affected by other factors for example causing lesions in the VMH tends to also damage the paraventricular nucleus which is another area of the hypothalamus.

Withering & Ransom did not take this into account which has effectively caused a loss in the reliability of their study. Not only this but Gold (1973) found that lesions in the VIM alone did not cause hyperplasia and stated that it is likely that damage done to the paraventricular nucleus (the area where Withering and Ransom caused damage) helps to cause hyperplasia, but there is one problem with Gold's study and that is that it has never been replicated and research has been found that shows that lesions in the Vim does cause overeating.

The dual control theory is a very reductionist theory as it assumes that the sole control of eating and feelings of hunger and satiety are biological and does not take into consideration environmental and emotional factors on why people have such eating characteristics. It is also quite deterministic in the way that it says that all control is biological meaning we individually have no control in it and that it is programmed and that we have no say in the matter, which is seen in everyday life to be incorrect as you see people going through life changes whose eating characteristics completely change.

Another theory is that ghrelin (a hormone given off by the stomach) triggers the hypothalamus to stimulate the sensation of hunger. Cummings (et al) did a study with 6 participants and monitored their ghrelin levels during and before eating throughout the day. She found that people's ghrelin levels fell straight after eating and peaked at the feeling of hunger. She concluded that ghrelin levels directly affected the level of hunger a person was feeling and reflected the emptiness of their stomach. The study was highly flawed as it had a lot of methodological issues.

Firstly the study was carried out on 6 male participants meaning we cannot extrapolate the findings to the general public and only to men. Another problem is that it is a very artificial environment which could have affected the participants' behavior and caused nervousness or anxiety which could have affected results as they were being monitored. Lastly the study is a correlation one meaning we can't conclude cause and effect. However this study does coincide and supports findings from previous research on gherkin.