# April 2010 Highlight

For the month of April, we are highlighting the recent paper “Can overeating induce conditioned taste avoidance in previously food restricted rats?” by Amanda Hertel and Roelof Eikelboom (*Physiology & Behavior*, 2010, *99*:482-486).

One of the most fascinating aspects of conditioned taste aversion (CTA) learning is the overwhelming diversity of unconditioned stimuli capable of supporting it. In addition to stimuli believed to be solely aversive (e.g., LiCl, radiation), CTAs can be acquired using stimuli with mixed rewarding and aversive effects (e.g., drugs of abuse). It has previously been theorized that satiety resulting from eating may also induce an internal state that is both rewarding and aversive. Using a cleverly designed CTA preparation, Hertel and Eikelboom now demonstrate that such a state, resulting from voluntary overfeeding, is capable of inducing a conditioned saccharin aversion in rats. These findings extend the growing list of unconditioned stimuli that support CTA learning and provide a preclinical behavioral model of intrinsic (aversive) factors that may limit the overconsumption of food.

In the first experiment, the authors placed rats in a variety of feeding conditions, including a food-restricted group that received only half of the daily food weight consumed by free-feeding rats. Next, taste aversion conditioning trials were conducted in which all rats received 24 h of *ad libitum* food and access to a novel saccharin solution in place of water. For the rats that were food restricted (as described above) between conditioning trials, the presentation of *ad libitum* food resulted in excess food consumption (as compared to that consumed by rats receiving daily *ad libitum* food access). Following three such conditioning trials, all rats received access to both water and saccharin in a two-bottle aversion test. During this test, rats that had binged during the conditioning trials (when given free access to food) showed a reduced preference for saccharin, indicative of a conditioned taste aversion induced by food overconsumption

A rich history of research has provided scientists in the CTA field with a variety of parametric manipulations known to influence the acquisition, strength and extinction of CTA learning. One such manipulation, experience with the conditioned stimulus (i.e., CS preexposure), has been shown to significantly impact CTA learning. Specifically, the acquisition of a CTA is attenuated if the conditioned stimulus is familiar, a phenomenon known as latent inhibition. For their second experiment, Hertel and Eikelboom assessed the sensitivity of overfeeding-induced CTAs to modulation by CS preexposure. Rats were first given unlimited access to either a saccharin solution or water for 8 days, followed by the taste conditioning procedure outlined above for Experiment 1. Consistent with other results from work with latent inhibition, rats receiving access to saccharin prior to taste conditioning did not show suppressed saccharin consumption during the aversion test. This result supported the notion that the suppression seen in their initial experiment was an acquired aversion to saccharin induced by binge eating.

In this innovative set of experiments, Hertel and Eikelboom provide evidence that satiation resulting from overeating includes a naturally aversive state, as assessed by the CTA preparation. With potential clinical implications for eating disorders, including obesity treatment, it will be interesting to see how this new line of research unfolds in the upcoming years.

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