

Food craving and addiction
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Definition.

The most commonly used definition of food craving is that it is an intense desire to eat a specific food. There are two parts of this definition that are important: One is that cravings are intense. They are stronger than ordinary food choices. The second is that cravings are specific: Craving is different from hunger. When hungry, presumably any of a variety of foods can be satisfying. During craving, we experience a sensory memory of a food. The memory acts as a template that has to be matched in order for the craving to be satisfied.

Nutritional significance.

Food cravings are of nutritional interest because of their high prevalence and their nutritional impact: Research at Monell has shown that close to 100% of young adult females and about 70% of young men report having experienced one or more food cravings at some time in the past year. There is some evidence that food cravings play a role in obesity. The incidence of cravings declines with age, especially in women. Cravers have higher BMIs (Body Mass Index), engage in more snacking behavior, are more likely to drop out of diet plans and are more likely to be binge eaters. More work is needed on the role of food cravings in obesity.

Characteristics.

A structured interview study at Monell has provided a rich source of descriptive information about food cravings:

Gender differences.

There are gender differences in incidence of food craving and in type of food craved. Women report more cravings overall. Men tend to report more cravings for savory foods and women tend to report more cravings for sweets. These gender differences are seen cross-culturally.

Type of Food.

Craved foods are generally high in fat. In addition to the fat, they can also be high in carbohydrate (as in desserts, salty snacks, or pasta) or protein (e.g. hamburgers). They can be salty or sweet (see above for gender differences). The "Why fat?" question is an important area for future research. The two most commonly craved foods among young adults in the United States are chocolate and pizza. Although more cross-cultural studies are needed, it is probably the case that cravings are greatly influenced by culture. For example, sushi craving has been reported in Japan. It would be interesting and valuable to study cravings in Japan.

Measurement of cravings.

There is no accepted non-verbal measure of food craving. Beyond the observation that cravings make it more likely that a food will be sought out and eaten, it is not established that there is a relationship between craving and any type of intake measure (e.g. amount of food consumed, rate of consumption). Therefore, the best way to measure food craving is to ask. There are some published scales to measure food craving, but they are cumbersome and often confound craving with hunger or emotional eating. Monell researchers have developed a set of simple techniques for measurement of food craving. For short-term changes, subjects can track the intensity of a current craving (or desire) by making a mark on a line (visual analog scale). For a slightly broader time frame, they can be asked to report on spontaneous cravings in the past 24 hours or the past week. For a longer-term measure of craving, it is useful to ask about the number and type of foods craved in the past year.

Monell scientists have recently published an fMRI study of food craving. In the future, this may be useful as a craving measure when verbal report is in doubt.

Monell has also developed a psychometrically sound craving questionnaire that measures individual differences in obsessive thinking and impulsive eating during craving.

Production of cravings.

Methods for producing cravings in the laboratory so that they can be studied experimentally have been developed. We have found that the threshold for cravings is lowered when subjects are on a monotonous, but nutritionally adequate diet. In the past we have used a commercially available dietary supplement beverage for the boring diet but have recently developed a solid loaf for the monotonous diet. The loaf is stable at room temperature and provides all of the subject's necessary nutrients and calories. Cravings can easily be triggered while the subject is on the monotonous diet by having him or her view or imagine a temporarily forbidden food.

Mechanisms.

Homeostasis.

It is commonly believed that cravings are related to nutritional need. Experimental studies do not support this hypothesis. For example, work at Monell demonstrates that cravings can be produced by putting subjects on a nutritionally adequate, but boring diet.

Learning.

There is a learned component to food cravings. Cravings can be triggered by exposure to (presumably learned) sensory cues (sight or smell of food). Learning mechanisms in food cravings are not well studied, but they are critical to development of treatments for food craving pathology and to understanding differences between food and drug cravings. We have recently demonstrated that we can train subjects to crave a novel food through daily exposure to that food. Further work is needed to understand the underlying mechanism for such learning. This is another key research area.

Neurochemistry.

Neurochemical studies are important because they may provide leads for treatments for individuals for whom cravings are troublesome. They are also relevant because they constitute the bulk of the evidence that food and drug cravings share common mechanisms. Food and drug cravings are probably affected in similar ways by manipulations that affect endogenous opiates, brain serotonin, and brain dopamine.

Neuroanatomy.

Neuroanatomical studies have also been used to draw parallels between food and drug cravings. Monell research shows that craving-related activation is found in parts of the brain associated with memory and habit. The prominent representation of memory structures supports the sensory-specificity of food cravings (e.g. "It has to be chocolate ice cream, lemon pie won't do").

Are cravings an indicator of food addiction?

There are many valid parallels between food cravings and drug cravings. And, at least for overweight individuals, a case can be made for food addiction or dependence. (Although, healthy individuals can resist food cravings.) In addition to food and drugs, virtually every activity (e.g. gambling, shopping, music, sports, sex, video games) shares a common pharmacology and neuroanatomy and is therefore, potentially "addictive".

It is sometimes asserted that incidence of craving and obesity has gone up because there is too much palatable food available. However, subjects in a monotonous diet study in our laboratories learned to crave a not-very-palatable dietary supplement beverage. Thus, food does not need to be palatable in order to be craved.

Recommendation.

Provision of single-serving packaging can allow consumers to enjoy their favorite foods with less chance of impulsive eating and excessive intake.

Reference List

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