Is Food Addiction a Mental Disorder?

These days, the concept of food addiction has become a rather popular belief. There are organizations like Food Addicts Anonymous that offer to help you self-diagnose food addiction and seek treatment. One can even take Dr. Oz's five-question online quiz titled, "Are you a food addict?"

But is there scientific evidence to support this idea? This article will walk you through what we know from science, including what the food addiction framework proposes and how research supports – and doesn't support – the theory.

Perhaps surprisingly, food addiction isn't just a recent idea. The scientific focus on the topic is several decades old, and belief in the addictive properties of substances like chocolate even date back to the 19th century. The notion has gotten even more popular in the past 10 years as researchers have proposed studying obesity as a result of seeming addiction to unhealthy foods. Currently, the concept of food addiction is heavily debated in the scientific community, with both strong supporters and skeptics.

Is it possible to become addicted to certain foods or ingredients?
The concept of food addiction relies on the belief that unhealthy foods – those high in sugar, salt, and fat – can be addictive in the same way some drugs are. Thus, it suggests that we can understand overeating through the same neurobiological framework as a substance-abuse disorder.

This food addiction framework focuses on products high in fat, sugar, salt, and calories – the most delicious or "highly palatable" ones – as the foods that are potentially addictive. Importantly, food addiction theory proposes that such products need to be highly processed in order to resemble drugs of abuse. Just as refinement of drugs makes them more easily absorbable and thus more potent (i.e., from coca leaf to cocaine), proponents of the food addiction model argue that processing of raw foods could increase their potency as well Specifically, as carbohydrates become more processed, their rate of absorption into the bloodstream (glycemic load) increases. In this way, refined carbohydrates (sugar) are suspected to have the most similarities to drugs, as some argue that this increased absorption rate is a key element of the addictive potential behind heavily processed foods. Though food addiction is a broad concept, sugar is the only addictive compound in food that has been clearly proposed. To a lesser extent, fat and sodium also get mentioned, though all these ingredients are normally proposed *in combination* when suggesting the possible addictive nature of highly palatable foods.

The American Psychological Association's (APA) diagnostic manual defines *addiction* as a "brain disease that is manifested by compulsive substance use despite harmful consequence." This definition relies on the dopamine theory, which states that addiction develops as a reward deficiency syndrome: drugs overstimulate the brain's reward mechanisms *so* much that the receptors for dopamine (the pleasure chemical) decline. As a result, tolerance develops, and one needs higher doses to achieve the same level of reward. Without higher doses, exceptionally strong cravings and withdrawal symptoms result. Importantly, the APA does not recognize food addiction as a disorder in its diagnostic manual. That is because the current body of research provides no conclusive evidence for either the reward deficiency syndrome in obese individuals, or addictive potential of any food compounds in humans. The latter would be crucial for supporting food addiction as a syndrome, since the APA definition specifies that addiction is a *substance* use disorder.

Despite lacking conclusive evidence, the notion of food addiction is still a popular one. This is not surprising, as media coverage of such research can easily confuse readers by focusing on single studies. For instance, a NYTimes article titled "What Cookies and Meth Have in Common" suggests that addiction to high-fat and sugary foods is scientifically demonstrated. However, it reports on a singular study that found obese people to have lower dopamine sensitivity, suggesting they experience "normal food consumption insufficiently rewarding" (thus supporting the reward deficiency syndrome).

Such reporting is problematic, since examining one study at a time can lead to rather misleading interpretations. Because results can vary from one study to the next, the scientific community relies on meta-analysis (combining and analyzing findings from multiple studies) to provide more conclusive evidence of whether concepts and theories are valid. On the topic of food addiction, a meta-analysis of over 30 studies on obesity and dopamine receptors concluded that there is *no* evidence for the reward deficiency theory. In doing so, this analysis demonstrates that, while some studies do show a decrease in dopamine receptors (like the one cited in the NY Times article), others do not show this relationship, and some research even shows an *increase* in dopamine receptors.

When a meta-analysis on a topic is not available, human studies provide stronger evidence than animal studies. Based on human research, there is also very little evidence to support sugar-related substance dependence. While some work shows that rats can develop addictive-like binging to sugar, researchers can induce such behavior *only* in highly controlled and rather unnatural environments. For example, rodents have to be food-deprived for 12 straight hours, followed by free access to sugar for another 12. This type of eating schedule has little relevance to the way humans eat. In fact, when rats are given *free* access to sugar (resembling our normal eating environment), addiction-like behaviors do not develop.

To further draw the parallel between the potency of processed foods and drugs, there are also popular claims that artificial sweeteners are also addictive since they are much sweeter than "natural" sugar. That, however, is also not supported by the evidence: non-caloric sweeteners like aspartame do not produce elevated sweet sensations in humans when compared to natural sweeteners like maple syrup.

Let us keep in mind, though, that this is a young science and no conclusive statements should be made just *yet*. Highly processed foods are clearly tempting – it is in fact profitable for food companies to create a rewarding combination of taste (the bliss point) to win over customers. However, claiming certain products are "addictive" to humans, if not outright incorrect, is certainly premature.

Can we be addicted to the act of eating itself?

Because there aren't any specific food ingredients known to trigger addiction, some researchers suggest looking at problematic overeating as an addiction to the *behavior* of eating itself. The concept of eating addiction or "addictive eating disorder" focuses on eating behavior, and thus takes away the focus from food ingredients as possible drug-like substances.

This shift may be in the right direction, as it is important to set apart the naturally rewarding properties of food from a chemical addiction. Eating solely for pleasure and not just out of need is

also not an abnormality, and assuming disease could lead to the medicalization of normal human behaviors. After all, we *expect* delicious foods to be very rewarding, since humans are evolutionary hardwired to seek foods high in fat and sugar. In nature, such foods signal dietary quality – ample calories and absence of dangerous poisons (detected via bitter tastes). In fact, this is the premise of the "evolutionary mismatch" hypothesis for chronic disease. While our attraction to highly palatable foods was essential for survival in the past, in modern environments of caloric overabundance it is pushed to extremes in the form of chronic overeating, and results in noncommunicable diseases, such as diabetes, heart disease, and cancer.

The fact that delicious foods activate our brain's reward center is simply not enough to assume a true addiction. Indeed, when considering our evolved eating behaviors as omnivores (those who eat a wide range of foods including plants and animals), the concept of "addiction" is not needed to explain why we overeat highly processed foods. Another explanation, for example, is that omnivores need variety in their diet in order to avoid deficiencies or illness through exposure to natural plant toxins. To ensure this variety, we experience palate fatigue- a sensory mechanism that makes sure we lose our taste for a food if we eat too much of it. Processed foods, however, may bypass this mechanism by introducing *many* flavors simultaneously and potentially leading to overeating (adding flavors to a food can indeed make people eat more).

What's the harm in calling it "food addiction"?

Considering the lack of clear scientific consensus and the often-misleading sensational media reporting on food addiction studies, it is not surprising that the notion of addictive foods causing obesity is popular. It is not necessarily clear whether this belief is damaging – after all, avoiding processed foods high in sugar can improve one's diet regardless of whether you consider them addictive or not. On another hand, some research suggests that self-diagnosing as a food addict could even encourage unhealthy eating behaviors. Specifically, considering oneself a food addict can lead to short-term avoidance of unhealthy foods, but in the long run such this behavior can result in stronger cravings and overeating of these avoided foods. Also, focusing on the possibility of addictive foods takes away attention from other problematic factors that contribute to overeating – such as using food to appease negative emotion or having a legitimately recognized condition, such as a binge eating disorder, that requires treatment.

In fact, as binge eating disorder is not specific to any particular food component, some researchers do propose that this addictive-like behavior is best described as an eating addiction, not a substance-use disorder. They also suggest that focusing on a behavioral addiction could have health advantages: while a possible addiction to a *food component* is a passive process, addiction to a *behavior* can have more helpful active solutions (i.e., practicing mindful eating).

To conclude, while many of us can relate to how enjoyable certain foods can be and how hard it is to give them up, proposing that overeating is a mental disorder is neither scientifically supported nor necessarily helpful in improving our diets. After all, if we decide to label activities that activate our brain pleasure centers as "addictive," we now also have mental disorder epidemic of cell phone addiction, sex addiction, and exercise addiction, to name a few.