

Commentary on Minhas et al.: Food addiction—the role of substance and environmental factors

Food addiction is associated with individual differences implicated in addictive disorders (e.g. impulsivity) and clinically significant problems (e.g. obesity). The addictive nature of highly processed foods plays a key role in driving addictive eating and the modern food environment contributes to the prevalence of food addiction in adults and children.

The article by Minhas and colleagues [1] is an important contribution to the debate about the role of addictive processes in compulsive overeating. Minhas and colleagues used a large ($n = 1432$) non-clinical community sample to estimate the prevalence of food addiction (as assessed by diagnostic indicators for substance use disorders) at 9.3%, which was lower than the prevalence of obesity (32.7%) [1], but similar to the prevalence of addictive disorders related to legal addictive substances (13.9% for alcohol use disorder) [2]. Food addiction was associated with individual differences implicated in other addictive disorders (e.g. attentional impulsivity, negative urgency) above and beyond body mass index (BMI) [1], which supports the conceptualization of this eating phenotype as an addictive disorder. Food addiction was also associated with clinically relevant outcomes (e.g. obesity, poorer quality of life), which highlights the importance preventing and treating addictive eating [1].

Addiction is a complex disorder that results from an interaction between (1) the addictive nature of a substance/behavior, (2) individual differences that increase risk (e.g. impulsivity) and (3) socio-environmental factors that increase the accessibility, availability and social acceptability of the addictive substance/behavior. Minhas and colleagues investigate the role of individual differences (e.g. impulsivity) in food addiction [1]. It is also important to consider the other factors that contribute to addiction: the addictive nature of the substance and the socio-environmental setting. The modern food environment has become dominated by highly processed (HP) foods (e.g. chocolate, ice cream, chips, pizza) in the last 50 years [3]. These HP foods have unnaturally high levels of refined carbohydrates and fat [4] and are more effective at activating reward systems than minimally processed (MP) foods (e.g. fruits, vegetables) [5,6]. These HP foods are mood-altering (e.g. increase pleasure, reduce negative affect) and trigger addictive responses, such as loss of control over consumption, intense cravings and an inability to cut down despite negative consequences [4,7]. However, can these HP foods truly be considered addictive?

As a field, we frequently debate what substances can trigger addiction. One of the last big debates surrounded tobacco products (e.g. cigarettes), which are legal, accessible and heavily marketed. They are created by an industry that optimizes tobacco's reinforcing properties to keep people hooked [8]. Tobacco does not cause an intoxication syndrome or severe physical withdrawal symptoms, which contributed to the controversy over whether it was truly addictive or just a bad habit [8,9]. When the Surgeon General's report labeled tobacco as addictive in 1988, tobacco products were estimated to be contributing to more than 300 000 cases of preventable death each year and 75–80% of quit attempts failed [8]. Like cigarettes, HP foods are legal, accessible and heavily marketed by an industry that designs these novel products to maximize 'cravability' and create 'heavy users' [10]. Like cigarettes, HP foods are not intoxicating and do not cause severe physical withdrawal symptoms. However, frequent HP food consumption is associated with a 31% higher risk of all-cause mortality [11], and most dietary change attempts fail in the long term [12]. Although we need to eat to survive, HP foods are detrimental for health and replace intake of more nutritious MP foods [3]. In sum, HP foods are highly reinforcing, mood-altering substances that trigger the diagnostic indicators of addiction (e.g. loss of control, cravings), have stark public health consequences and high relapse rates. All these factors support the conceptualization of HP foods as addictive substances.

Environmental factors that increase the harm of other addictive substances (e.g. cheap, accessible, marketed) [13] also define the HP food environment. The magnitude of individual risk (e.g. impulsivity) needed to develop addictive patterns of intake in a food environment dominated by cheap, accessible and heavily marketed HP food is probably much lower. Given that children and teens are generally more impulsive than adults [14], they may be particularly vulnerable to the negative effects of the HP food environment. Food addiction is prevalent in children and teenagers, which is related to obesity and poorer mental health [15,16]. Personalized interventions that target addictive mechanisms may increase the success rates of current diet-change interventions for adults and children. However, environmentally focused approaches have been essential to reducing the public health consequences associated with other addictive substances (e.g. cigarette taxes, removing cigarette vending machines, marketing restrictions) [17]. If scientific consensus builds that HP foods are addictive, environmental approaches will probably play an essential role in reducing the harms

associated with food addiction (e.g. obesity, lower quality of life) throughout the life-span.

Declaration of interests

None.

Keywords Food addiction, food environment, processed food.

ASHLEY N. GEARHARDT 

Department of Psychology, University of Michigan, Ann Arbor, MI, USA

E-mail: agearhar@umich.edu

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