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Guilty pleasures: The effect of perceived overeating on food addiction attributions and snack choice

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ABSTRACT

Despite being widely debated throughout the scientific community, the concept of food addiction remains a popular explanation for overeating and obesity amongst the lay public. Overeating is often accompanied by feelings of guilt and dietary concern, and this may lead people to attribute their eating to an addiction in order to minimise personal responsibility. Research also indicates that food addiction attributions and dietary concern may lead people to limit their exposure to tempting foods. To test these ideas, we examined the effect of perceived overeating on food addiction attributions and snack choice. Subjective ratings of guilt and dietary concern were indirectly manipulated by leading female participants (N=90) to believe they had eaten more than (overeating condition), less than (undereating condition), or roughly the same (control condition) amount of palatable foods in relation to their own estimated consumption and to previous participants. Participants then rated the relative importance of a list of explanations for their eating (including "the foods were really addictive") and selected a snack to take home with them. Ratings of guilt and dietary concern were highest in the overeating condition, and lowest in the undereating condition, indicating that the manipulation had been successful. However, findings revealed no effect of condition on food addiction attributions. As predicted, participants in the overeating condition selected less tempting snacks than in the undereating condition. However, this effect was not mediated by guilt/dietary concern. There was also no association between food-addiction attributions and snack choice. These findings suggest that perceived overeating affects snack choice but not food addiction attributions. Future research should investigate whether food addiction attributions may be driven by feelings of guilt and dietary concern following *longer-term* disinhibited eating patterns.

1. Introduction

Worldwide rates of obesity have more than doubled in the past three decades, with approximately 1.9 billion people classified as overweight (BMI > 25 kg/m^2), and 600 million classified as obese (BMI > 30 kg/m^2) (World Health Organization, 2016). This so-called 'obesity epidemic' has been attributed to a range of environmental, behavioural, and biological factors, and one theory holds that an 'addiction' to high-calorie foods may underlie some cases of obesity (e.g. Kenny, 2013). The concept of food addiction is widely debated throughout the scientific community, and several researchers have contested the view that food can be addictive in the same way as drugs of abuse (Carter et al., 2016; Hebebrand et al., 2014; Ziauddeen, Farooqi, & Fletcher, 2012). Despite this, the theory appears to receive much support from the lay public (Ruddock & Hardman, 2017). Recent surveys show that 86 per cent of community samples believe that certain foods are addictive, and 72 per cent hold the view that food addiction is to blame for the increased prevalence of obesity (Lee et al., 2013). Support for the food addiction concept appears to be particularly popular amongst those with increased weight status (Lee et al., 2013); for example, individuals with increased BMI were more likely to believe that they are addicted to food (Ruddock, Dickson, Field, & Hardman, 2015). In addition, research suggests that the term 'food addiction' is commonly used by members of the lay public to refer to a range of eating behaviours such as reward-driven eating, a preoccupation with food, and regular cravings (Ruddock et al., 2015).

Given the lack of *scientific* support for the concept, one possibility is that people may use food addiction to provide a more personally and socially acceptable attribution for overeating (Rogers & Smit, 2000). Specifically, it is thought that, by attributing eating to the 'addictive' effects of the food or to a biological

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'addiction', perceptions of personal responsibility are minimised. This perspective is in accordance with Attribution Theory (Weiner, 1974; Weiner et al., 1971) which accounts for the tendency for individuals to provide self-serving attributions for undesirable behaviours which emphasise the role of *external* and *uncontrollable* causes, such as biological or environmental influences, and to downplay the role of *internal* and *controllable* factors, such as personal choice (Sedikides & Strube, 1995). Using this framework, the concept of 'addiction' is thought to implicate uncontrollable influences upon behaviour and thus portrays the drug user or overeater as a 'helpless victim of disease' (Davies, 2013).

Consistent with this idea, there is evidence that self-serving attributions, which emphasise the role of uncontrollable and external influences, may be used as a means of 'excusing' perceived overeating. In a recent study, participants who believed they had eaten more than usual were more likely to attribute their eating to the size of the portion (an external influence), compared to those who believed they had eaten less or roughly the same as usual (Vartanian, Reily, Spanos, Herman, & Polivy, 2017). Similarly, self-reported emotional eaters who were led to believe they had eaten more than previous participants (i.e. norm violating feedback), were more likely to attribute their eating to negative emotions (i.e. an uncontrollable factor) compared to those in a control condition (Adriaanse, Prinsen, de Witt Huberts, de Ridder, & Evers, 2016). These findings suggest that there may be a *causal* effect of perceived overeating on self-serving attributions. There is also evidence that self-serving attributions are associated with dietary concerns and negative affect following eating. In one study, participants who were primed to overeat experienced greater negative affect, and were subsequently more likely to attribute their eating to an uncontrollable cause (i.e. mental fatigue), compared to those in a control condition (Adriaanse, Weijers, de Ridder, de Witt Huberts, & Evers, 2014). Negative emotional states following overeating, such as increased guilt and concern, may therefore make it more likely that people will attribute their eating to external causes (e.g. food addiction) as a way of minimizing personal responsibility.

Food addiction attributions and eating-related guilt and concern may also have consequences for subsequent food choice. The concept of food addiction is often used to denote a perceived lack of control around food (Ruddock et al., 2015) and, according to predictions derived from self-efficacy theory, such low self-control beliefs may have detrimental effects on healthy eating (Steptoe & Wardle, 2001). However, contrary to this, there is evidence that being aware of one's limited capacity for self-control may help motivate individuals to minimise their exposure to tempting foods. In one study, hungry participants, who believed they had a *low* capacity for self-control, selected less tempting snacks to take home with them (when given a monetary incentive to return the snack one week later), compared to satiated participants who believed they had a *high* capacity for self-control (Nordgren, van Harreveld, & van der Pligt, 2009). In another study, participants who were led to believe that they had scored highly on an ostensible measure of food addiction, demonstrated higher levels of dietary concern and subsequently exposed themselves to tempting foods for less time than those who were led to believe they had low or average levels of food addiction (Ruddock, Christiansen, et al., 2016). These findings suggest that individuals who perceive themselves to be 'food addicts', and who experience increased levels of dietary concern, may be particularly inclined to minimise their exposure to tempting foods. Feelings of guilt may also affect the extent to which individuals expose themselves to tempting foods. Indeed, it is thought that guilt serves as a reminder of one's long-term goals, and motivates individuals to engage in behaviours which 'correct' a perceived goal violation (Allard & White, 2015; Tangney, Stuewig, & Mashek, 2007). In support of this, a recent meta-analysis has highlighted an important role of guilt in the implementation of a variety of health behaviours (Xu & Guo, 2017).

Drawing on the above, the primary aim of the current study was to investigate whether feelings of guilt and dietary concern following perceived overeating would lead individuals to attribute their eating to a 'food addiction' and to the foods' addictive properties. Feelings of guilt and dietary concern were indirectly manipulated by leading participants to believe they had eaten more than (overeating condition), less than (undereating condition), or roughly the same (control condition) amount of palatable food as their own estimated consumption and relative to previous bogus participants. It was predicted that those in the overeating condition would demonstrate higher levels of guilt and dietary concern, and would consequently be more likely to perceive themselves as food addicts (hypothesis 1) and to attribute their eating to the 'addictiveness' of the foods (hypothesis 2), relative to those in undereating and control conditions.

A secondary aim was to examine the effects of guilt and dietary concern on the extent to which participants would minimise their exposure to tempting foods. In line with previous research (Nordgren et al., 2009; Ruddock, Christiansen et al., 2016), we hypothesised that individuals in the overeating condition would select less tempting snacks to take home with them, compared to those in control and undereating conditions, and that this would be mediated by higher levels of guilt and dietary concern (hypothesis 3). Finally, we explored whether the selection of less tempting snacks would be associated with self-perceived food addiction and low self-control beliefs, consistent with previous findings (Nordgren et al., 2009; Ruddock, Christiansen, et al., 2016) (hypothesis 4).

2. Method

2.1. Participants

A power calculation was conducted using G*Power (Erdfelder, Faul, & Buchner, 1996). This determined that a total sample size of 84 was required to detect a medium-sized main effect between three conditions ($\alpha = 0.05$, power = 0.8, f=0.35) in a between-subjects design. Medium-sized effects have been reported in previous similar research (Adriaanse et al., 2014; Ruddock, Christiansen, et al., 2016). We slightly over-recruited to account for participants guessing the aims of the study. Female staff and students ($N = 90$) from the University of Liverpool were invited to take part in a study which they were led to believe was about memory and food intake. Participants were randomly allocated to one of three conditions (i.e. overeating, undereating, or control), such that there were 30 participants in each condition. As this was a preliminary study into food addiction attributions, only females were recruited in order to minimise between-subject differences. Participants were excluded from the study if they were currently dieting, or had any food allergies or intolerances. Ethical approval was granted by the Institute of Psychology, Health and Society at the University of Liverpool.

2.2. Measures and materials

2.2.1. Ad libitum buffet lunch

The buffet lunch consisted of a variety of sweet and savoury high fat/sugar foods. In total, the lunch comprised 2608 calories and 117.5 g fat (see supplementary online materials for more details). Plates and bowls were covertly weighed before and after consumption to provide a measure of actual calorie intake.