



## Research report

## Dieting and food craving. A descriptive, quasi-prospective study

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## ABSTRACT

Evidence linking food restriction and food craving is equivocal. This study investigated whether dieting was associated with a greater frequency of food craving. Dieting to lose weight was distinguished from watching so as not to gain weight. Participants were 129 women (mean age = 41 yrs): 52 were currently dieting to lose weight, 40 were watching their weight, and 37 were non-dieters. They completed a food craving record after every food craving, a food diary, and a daily mood assessment over 7-days. Of the 393 craving incidents recorded, dieters experienced significantly more food cravings than non-dieters, with watchers intermediate. Chocolate was the most craved food (37% of cravings) but neither the types of food, the proportion of cravings leading to eating (~70%), the situations in which cravings occurred, nor the time since the last eating episode differed between groups. Compared with non-dieters, dieters experienced stronger cravings that were more difficult to resist, and for foods they were restricting eating. Watchers showed similarities in experience both to dieters (low hunger) and non-dieters (lower craving intensity). These results support an association between dieting and food craving, the usefulness of distinguishing dieting to lose weight and watching, and suggest a need for further experimental investigation of actual food restriction on food craving experiences.

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## Introduction

Withdrawal or abstinence effects are widely accepted explanations for cravings. It follows that voluntary food restriction through dieting should be expected to be associated with higher levels of food craving experiences. In fact, much of the evidence associating dieting with changes in food craving does not support this view. For example, *Appetite* published a mini-symposium on food craving in 1991. In a survey of female Canadian undergraduates, the 15% who said they were currently on a diet were no more likely to report food cravings than the non-dieters (Weingarten & Elston, 1991). US women interviewed about their craving experiences on four occasions over a 2-year period scored no higher on dietary restraint than those who experienced no food cravings (Rodin, Mancuso, Granger, & Nelback, 1991). While an association between dietary restraint and craving strength was found in a cross-sectional study of UK women, restraint was unrelated to craving frequency (Hill, Weaver, & Blundell, 1991).

More recently, ratings of craving intensity and frequency were found to be unchanged at the end of a 6 month weight management programme (Gilhooly, Das, Golden, et al., 2007). What did change was a reduction in the number of times the craved for foods were eaten. This reduction in giving in to cravings was related to greater weight loss over the intervention but describes an association rather than a causal relationship.

Studies of fasting add a further complication. Both in the short- (Lappalainen, Sjödén, Hursti, & Vesa, 1990) and long-term (Harvey, Wing, & Mullen, 1993), fasting is associated with fewer food craving experiences. This decrease in craving is generalised across all food groups and does not appear to rebound during re-feeding (Harvey et al., 1993; Martin, O'Neil, & Pawlow, 2006). Nor is there a relationship between the amount of weight lost and any change in craving reports. However, the reduction in food cravings is consistent with the suppression of appetite observed during very low calorie diets (Wadden, Stunkard, Day, Gould, & Rubin, 1987), and in patients with eating disorders restricting their food intake (Halmi & Sunday, 1991; Moreno, Warren, Rodríguez, Fernández, & Cepeda-Benito, 2009).

The failure to consistently link dieting with changes in craving may be due to uncertainty over the measurement of dieting or restrained eating and whether they are reflected in altered food intake. For example, measures of dietary restraint are poorly related to energy intake outside the laboratory in the short- (Stice, Sysko, Roberto, & Allison, 2010) and longer-term (Williamson et al., 2007). In addition, current dieting and restrained eating have been proposed as having different effects on eating behaviour (Lowe, 1993), a distinction supported in laboratory (Guerrieri, Nederkoorn, Schrooten, & Jansen, 2009) and free-living investigations (Rideout & Barr, 2009).

The present study focussed on current dieters but made a distinction between participants dieting to lose weight and those watching what they ate so as not to gain weight. This distinction has not been made before in the context of food craving but follows

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a detailed study of teenage dieting (Nichter, Ritenbaugh, Nichter, Vuckovic, & Aickin, 1995). Dieters were girls who said they dieted always or most of the time. Girls watching what they eat but not currently dieting described their behaviour as a health-promoting strategy. This was reflected in dietary outcomes associated with more healthful eating and links well with other research distinguishing unhealthy and healthier dietary approaches to weight loss in this age group (Neumark-Sztainer, Hannan, Story, & Perry, 2004). Watching to avoid weight gain is more common than dieting for weight loss but both involve constraints over eating (Hill, 2002). As a more healthy and weight maintaining strategy, watching may also mitigate against food craving.

The failure to link dieting with craving may also relate to other features that dieters deprive themselves of, namely, the foods they usually consume and the associated enjoyment of eating. Restriction has been associated with cravings for foods such as chocolate (e.g. Hormes & Timko, 2011), for which a variety of primarily cognitive processes has been suggested (Hill, 2007). Ambivalence, or the conflict between desire for a food and feelings of guilt, is also relevant to dieting and the foods that dieters typically restrict consumption of (Cartwright & Stritzke, 2008; Rogers & Smit, 2000). Furthermore, abstinence accounts of craving emphasise the role of the consequent dysphoric state in driving craving. Mood has stronger links to craving than hunger in dieters (Hill et al., 1991) and in women with bulimia nervosa (Waters, Hill, & Waller, 2001). Cravings have been linked to mood regulation through biological processes, and via positive and negative reinforcement effects (see review by Hill (2007)). Accordingly, reported restriction and affect, local to the craving experience and over the day, were also investigated in the present study.

The aim of this study therefore was to investigate whether dieting or watching to avoid weight gain were associated with a greater frequency of food craving. It was hypothesised that dieters would report more food craving experiences than non-dieters, and that these would be of greater intensity, occur in the context of negative mood, and be for foods they were trying to restrict. Watchers were hypothesised to be more like non-dieters in respect of food craving frequency and nature.

## Methods

### Participants

One hundred and twenty-nine women (mean age = 40.9 yrs) were recruited from two sources: three commercial weight loss clubs in different parts of England ( $N = 38$ ) and from the community where the clubs took place ( $N = 91$ ). Permission was given to approach club members for a study on food craving and the majority approached agreed. Women in the community sample responded to adverts placed in the weight loss club venue or were acquaintances of weight loss club members. The only exclusion criteria were age less than 18 and current pregnancy. No reference to dieting was made in the information for participants and no financial incentive was offered for participation. The study was approved by the research sub-committee of the Clinical Psychology Doctoral programme at the University of Leeds.

### Measures

#### Craving record

This was an adaptation of the craving record developed and used by Hill and Heaton-Brown (1994) and Waters et al. (2001) and provided detailed information about the subjective experience of participants' food cravings. Four main areas were covered: the antecedents to and context of the craving (including whereabouts,

social context, and triggers), craving intensity, the nature of the food craved, and subsequent behaviour, hunger, and mood state. Participants rated their mood and hunger levels immediately before and after the craving occurred, providing onset and post-craving measures. Visual analogue scales (100 mm) were used for participants to rate hunger and characteristics of the craving experience (strength, difficulty resisting, target food restriction, and speed of disappearance). Mood state was assessed by a shortened (12-item) version of the UWIST Mood Adjective Checklist (UMACL; Matthews, Jones, & Chamberlain, 1990). This has three subscales reflecting different aspects of mood state: hedonic tone (happy, sad), tense arousal (tense, relaxed), and energetic arousal (alert, tired). Participants were required to choose one of four responses to indicate the extent to which they were feeling each of the emotions on the checklist (3 = extremely, 2 = moderately, 1 = slightly, and 0 = not at all). The psychometrics of the UMACL are well established (Matthews et al., 1990) and the internal reliability of the shortened version is acceptable (subscale  $\alpha = 0.75$  and above).

#### Daily questionnaire

This was a set of ten 100 mm visual analogue scales (anchored not at all to extremely) that was completed towards the end of each study day. Participants were asked to rate each of the following states according to how they felt that day: anxious, ease of eating control, content, thirsty, hungry, tense, irritable, alert, vulnerable (emotionally), and bored.

#### Food diary

Participants were asked to record everything they ate and drank over the study period in an A5 booklet with half a day's information recorded on each page. They were asked to record the time of consumption and the approximate quantity of food and drink consumed. The intention of the diary was to locate food craving experiences relative to eating episodes rather than as a measure of food intake.

#### Background questionnaire

This included questions about current weight and height, weight history, date of birth, date of last menses, and usual length of their menstrual cycle. Body shape satisfaction was assessed using the body figure scale originally developed by Stunkard, Sorensen, and Schulsinger (1983), and asked participants two questions: (1) 'Which figure is most like you now?' and (2) 'Which figure would you most like to look like?' Body shape satisfaction was derived from subtracting the rating of currently perceived body shape from that of the preferred body shape. Negative scores indicated a preference for thinness. Participants were asked about their current dieting status and to self-designate as: currently dieting to lose weight, currently dieting or watching what they ate so as not to gain weight, or not currently dieting. Dietary restraint was measured by the restraint scale of the Dutch Eating Behaviour Questionnaire (DEBQ; van Strien, Frijters, Bergers, & Defares, 1986).

#### Procedure

Following signed consent, participants were individually briefed regarding the study assessments and provided a study pack with instruction sheet, 20 craving record forms, seven daily questionnaire forms, and a food intake diary. Further forms were available on request. Participants were asked to complete a craving record on each occasion they experienced a food craving as soon after the craving as possible. For the purpose of this study a food craving was defined as a strong desire to eat a particular food regardless of whether they ate in response. To familiarise them with the study materials, participants were asked to complete a sample copy of the daily questionnaire according to how they had felt that day, to

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