

# The phenomenology of food cravings: The role of mental imagery

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## Abstract

The study aimed to investigate the role of mental imagery in the experience of food cravings. A sample of 130 undergraduate students was first asked to recall and rate a previous food craving experience. Second, they were asked to imagine themselves eating their favourite food and to rate the involvement of different sensory modalities. It was found that mental imagery was a key element in both the retrospective craving experience and the current food induction. In particular, craving intensity was related to the vividness of the food image ( $r = .46$ ). The specific sensory modalities most involved were visual (39.7%) and gustatory (30.6%), followed by olfactory (15.8%). There was little involvement of auditory or tactile modalities. It was concluded that cognitive experimental techniques aimed at reducing the vividness of visual, gustatory or olfactory imagery, might usefully be deployed to reduce unwanted food cravings.

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*Keywords:* Food craving; Craving intensity; Mental imagery; Sensory modalities

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## Introduction

Food cravings refer to a motivational state whereby an individual feels compelled to seek and ingest a particular food (Baker, Morse, & Sherman, 1986). It is the intensity of this state and the specificity of the craved food, which distinguish food cravings from ordinary food choices or general hunger (Pelchat, 2002). Although such food cravings are normative everyday experiences (Hill & Heaton-Brown, 1994; Lafay et al., 2001), most research has addressed their potentially maladaptive nature. For example, food cravings have been associated with binge eating (Gendall, Joyce, Sullivan, & Bulik, 1998; McManus & Waller, 1995), which in turn contributes to both obesity (Wurtman & Wurtman, 1995) and eating disorders (Gendall et al., 1998; Waters, Hill, & Waller, 2000). Food cravings are also associated with guilt (Macdiarmid & Heatherington, 1995) and depression (Gendall et al., 1998), and have been shown to impair cognitive performance (Green, 2001).

Most research interest has focused on the origins of food cravings, and it is now generally accepted that a

range of biological, affective and cognitive triggers all play a role. Although food cravings have commonly been associated with hunger (Hill, Weaver, & Blundell, 1991) and attributed to nutritional and calorific deficits (Wardle, 1987), it is clear that nutritional deprivation is not a necessary condition for food cravings (Pelchat & Schaefer, 2000). Other triggers include menstrual-related changes (Dye, Warner, & Bancroft, 1995), negative mood states (Hill & Heaton-Brown, 1994; Hill et al., 1991; Lafay et al., 2001), as well as expectations and cognitions (Weingarten & Elston, 1990). Experimentally, food cravings have been induced by the thought, smell or pictures of food (Alsene, Li, Chaverneff, & de Wit, 2003; Fedoroff, Polivy, & Herman, 2003; Green, Rogers, & Elliman, 2000).

Broadly based surveys have established that food cravings are relatively common, that most people indulge their cravings on the majority of occasions, and that chocolate is the most commonly and intensely craved food in Western societies (Lafay et al., 2001; Weingarten & Elston, 1991). Less is known about the phenomenology of food cravings. Thus, we sought to study aspects of the actual experience of food craving episodes. In particular, a number of lines of evidence point to a role for mental imagery. For example, Green et al. (2000) reported a positive correlation between latency on a simple reaction time task following food-related imagery induction and

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self-reported desire to eat. They concluded that food cravings reduce the resources available for cognitive performance and that such cravings can be induced by imagery instructions. Similarly, Harvey, Kemps, and Tiggemann (2005) found that craving intensity increased following instructions to imagine a food script, but not a non-food script. They also noted a positive correlation between self-reported vividness of the imagined food script and craving intensity. These observations illustrate the role of mental imagery in food cravings and corroborate anecdotal reports of food-related images in craving experiences (Salkovskis & Reynolds, 1994). The current study aimed to document the occurrence of such mental imagery in naturalistic food cravings.

A specific objective was to further investigate the nature of any imagery processes involved in food cravings. In recent years, cognitive psychologists have mounted an argument that phenomenological experience is amenable to the methods of experimental cognitive psychology (Baddeley & Andrade, 2000). In particular, a working memory approach has been adopted to conceptualize the phenomenological experience of mental imagery (Holmes & Hackmann, 2004; Pearson, 2001). The most widely adopted account of working memory is the model postulated by Baddeley (2000) comprising three components: a central executive which operates as a supervisory system, and two limited-capacity slave systems, the visuo-spatial sketch pad and the phonological loop, which maintain visuo-spatial and verbal material, respectively. Harvey et al. (2005) used this model to interpret their finding that food craving ratings were lower following a visual but not auditory secondary imagery task as showing that the imagery processes underlying food cravings are visual, rather than verbal or auditory in nature.

The present study aimed to extend these initial investigations by directly investigating the specific nature of the mental imagery in food craving experiences. Imagery can occur in other sensory modalities besides sight and hearing (Sheehan, 1967). Indeed, it is quite likely that images involving taste and smell will be particularly potent in food craving. In their study of the subjective aspects of everyday desires, May, Andrade, Pannabokke, and Kavanagh (2004) found that cravings (food, tobacco, soft-drink, and alcohol were combined) were generally attributed to spontaneous thoughts rather than to any identifiable cue in the environment, and that they involved primarily olfactory and visual imagery. As yet, there is no information available on the sensory modality of craving-related images for specifically food. Thus, we wished to investigate three research questions: (a) whether mental imagery plays a role in the experience of food craving, specifically whether people who experience strong cravings have more vivid food images; (b) whether people who have vivid food images have high imaging ability in general; and (c) the nature of the

specific sensory modalities involved in craving-related food images.

## Method

### *Participants*

The participants were 130 undergraduate students (56 men, 74 women) at Flinders University who took part for course requirements and credit. They ranged in age from 17 to 44 years.

### *Procedure*

Participants completed a survey entitled 'Food Craving Survey' in small groups. The survey consisted of three separate questionnaires administered in turn. This served to prevent participants from flicking forward to future questions and thus reduced the potential for response biases due to demand effects. The first questionnaire entitled 'Food Craving Experience' concerned an actual previous craving experience. The second questionnaire 'Favourite Food' attempted to induce food craving in the laboratory. Both were aimed at assessing the nature of *state* food cravings. The final questionnaire contained *trait* measures of habitual food craving, imaging ability, and dietary restraint.

### *Materials*

#### *Food craving experience questionnaire*

After some background information including self-reported height and weight, the questionnaire instructed participants to think back to the last time they had a food craving ('i.e. an intense urge to eat a particular food'). Participants were to recall the experience as clearly as they could, 'as if it were happening again right now', and to really put themselves into the situation. They were asked to write a short paragraph describing this food craving experience in as much detail as they could, focusing in particular on 'what the actual craving was like'. They were provided with 14 lines to do this. Participants were then asked to rate the intensity of their craving at that time on a 10-point scale (1 = 'very slight', 10 = 'overwhelming') and to specify the food craved. They were then presented with a list of 14 potential triggers for the craving and asked to rate each one on a 5-point scale Likert scale (1 = 'not at all', 5 = 'definitely'). This scale was expanded and adapted from that of May et al. (2004) to be specific to food (as opposed to nicotine or alcohol). The trigger statements were selected to cover a number of classes of antecedents, including biological ('hunger'), affective ('stress'), external cues ('smelt the food'), intrusive thoughts ('suddenly thought about the food') and mental imagery ('imagined the smell/taste of the food').

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