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Research report

Brief guided imagery and body scanning interventions reduce food cravings

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ABSTRACT

Elaborated Intrusion (EI) Theory proposes that cravings occur when involuntary thoughts about food are elaborated; a key part of elaboration is affectively-charged imagery. Craving can be weakened by working memory tasks that block imagery. EI Theory predicts that cravings should also be reduced by preventing involuntary thoughts being elaborated in the first place. Research has found that imagery techniques such as body scanning and guided imagery can reduce the occurrence of food thoughts. This study tested the prediction that these techniques also reduce craving. We asked participants to abstain from food overnight, and then to carry out 10 min of body scanning, guided imagery, or a control mind wandering task. They rated their craving at 10 points during the task on a single item measure, and before and after the task using the Craving Experience Questionnaire. While craving rose during the task for the mind wandering group, neither the guided imagery nor body scanning group showed an increase. These effects were not detected by the CEQ, suggesting that they are only present during the competing task. As they require no devices or materials and are unobtrusive, brief guided imagery strategies might form useful components of weight loss programmes that attempt to address cravings.

Introduction

Desires for food are common, everyday experiences, and are highly adaptive in signalling the need to eat sufficient food to fuel activity and maintain healthy physiological systems. However, when desires become intense cravings and cannot immediately be satisfied, they are aversive, and when they trigger significant distress or excessive eating or impair our ability to perform other important cognitive tasks, they may become highly dysfunctional.

The Elaborated Intrusion Theory of Desire (EI Theory; Kavanagh, Andrade, & May, 2005) explicates processes underpinning the onset, exacerbation and termination of desires for appetitive targets including food. Initially, desire-related cognitions typically appear spontaneous, because they are triggered by associated environmental or internal cues rather than being deliberately elicited (Kavanagh et al., 2005). If other later cognitions capture attention, intrusive desire-related thoughts may not be processed further (Kavanagh, May, & Andrade, 2009). However, if the pleasure or relief from these cognitions gives them greater salience than other concurrent experiences, they are consciously elaborated, further increasing their affective power. Central to the theory is that sensory imagery is especially likely, and because it simulates the actual experience, it conveys a stronger affective pull than other cognition and is therefore more likely and more vivid when craving is intense (Andrade, May, & Kavanagh, 2012; Kavanagh et al., 2012; May, Andrade, Kavanagh, & Hetherington, 2012; Statham et al., 2011).

According to EI Theory, the elaboration of craving imagery places demands on limited-capacity working memory systems, and in particular, on the visuospatial sketchpad, which is required for construction of visual images (Baddeley & Andrade, 2000). Concurrent tasks that require attention to other visuospatial information reduce the vividness of imagery and blunt the intensity of associated craving, especially if they impose a working memory load. So, Andrade, Pears, May, and Kavanagh (2012) found that constructing shapes from clay that was hidden behind a screen reduced craving for chocolate: This task requires repeatedly comparing visual imagery about a desired product with imagery constructed from tactile information, as well as co-ordination of hand movements based on this imagery. Instructions to create competing, emotionally neutral imagery also reduce cravings, including ones for coffee (Kemps & Tiggemann, 2009), cigarettes (May, Andrade, Batey, Berry, & Kavanagh, 2010; Versland & Rosenberg, 2007), chocolate (Kemps & Tiggemann, 2007) and other food (Harvey, Kemps, & Tiggemann, 2005; Kemps & Tiggemann, 2007). In contrast, since food-related craving rarely requires auditory imagery, tasks that load on the phonological loop have only weak

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effects at best (Kemps & Tiggemann, 2007; May, Andrade, Panabokke, & Kavanagh, 2010), unless they impose heavy general cognitive (or 'central executive') load (Andrade et al., 2012).

Another approach to the management of cravings uses mindfulness (Alberts, Mulkens, Smeets, & Thewissen, 2010; Alberts, Thewissen, & Raes, 2012), which involves enhancement of non-judgemental awareness of the present moment or experience (Brown & Ryan, 2003). The absence of a necessity either to control or elaborate thoughts, and an attention to ever-changing experiences, join to liberate the person from entanglement in rumination (Kabat-Zinn, 2003).

Consistent with this idea, in Berry, May, Andrade, and Kavanagh (2010) people who were naturally mindful had less distress in response to intrusive desire-related thoughts and had lower craving than less mindful people. Similarly, Alberts et al. (2012) found that people who undertook 8 weeks of mindfulness-based cognitive-behaviour therapy had greater decreases in food cravings and in their eating in response to sensory cues or negative emotional states than did others on a wait list. Jenkins and Tapper (2013) found that people who were trying to reduce their chocolate consumption ate less chocolate when following a mindfulness-based cognitive defusion strategy (seeing their thoughts as merely thoughts) than a control (muscle relaxation) group, or a group who accepted chocolate thoughts (by 'urge surfing', using the knowledge that urges are transient, to help with resisting desires to indulge). Papies, Barsalou, and Custers (2012) also found that brief training in 'mindful attention', viewing thoughts as transient mental events, reduced approach responses to appetitive foods.

Body scanning is a technique commonly used in mindfulness training, where the focus of attention is consciously directed around the body, while concurrently maintaining an awareness of breathing (Cropley, Ussher, & Charitou, 2007). As in other mindfulness exercises, the person is encouraged to attend to changing experiences without questioning, suppressing or being judgemental of ones that come to mind (Kristeller & Hallett, 1999). If other thoughts and emotions arise, they are noted briefly before returning attention to the body.

While mindfulness exercises including body scanning are derived from ancient Buddhist traditions, their expected effects on craving are highly consistent with EI Theory. For example, the attentional demands of body scanning would reduce cognitive capacity for the elaboration of craving imagery, while a focus on new, emerging experiences would introduce craving-irrelevant content. Accepting desire-related thoughts rather than trying to suppress them would avoid the risk that monitoring the suppression would ironically provide a trigger for their occurrence (Wegner & Erber, 1994), while adopting the stance of a curious bystander would blunt the affective intensity of the thoughts (and their ability to maintain a cyclical elaboration of craving cognitions).

There are indications that body scanning may indeed help people to address food cravings. A small randomised controlled trial by Alberts et al. (2010) with attendees at a weight reduction programmes reported lower food cravings after a 7-week mindfulness-based intervention where body scanning was an important component. In a more controlled setting, May, Andrade, Batey, et al. (2010, Experiment 2) examined the effect of 10 min of body scanning instructions on thoughts and craving for snack foods by students who were attempting to reduce consumption of snack foods and had not eaten for 2 h. Effects were compared with those from guided imagery and control (mind wandering) instructions. During the experimental period, body scanning and guided imagery reduced concurrent thoughts about snack foods, relative to 10-min baseline and post-task periods, but the control instructions did not. However, there were no condition by time effects on single-item ratings of craving for snack foods that were taken at the end of each period. In contrast, May, Andrade, Willoughby, and Brown (2012) found that both craving and thought frequency about smoking were reduced in the experimental period by body scanning, relative to mind wandering. That study applied a 2-session within-subjects design with smokers who were asked to abstain from smoking for 2 h, and measured craving by Factor 1 of the Questionnaire on Smoking Urges (Tiffany & Drobes, 1991), but otherwise had a similar procedure to May, Andrade, Batey, et al. (2010).

The current study attempted to address two potential reasons for the lack of effects on craving for snack foods in May, Andrade, Batey, et al. (2010). Firstly, it increased the period of food deprivation from 2 h to at least 9 h (in recognition of the need to induce a stronger sense of deprivation, such as we saw after abstention from smoking). Secondly, it sampled craving during the baseline, experimental and post-task periods rather than relying on craving assessments after completion of the instructional task (when competing tasks were no longer present). The study retained the three-group between-subjects design and instructional procedures used by May, Andrade, Batey, et al. (2010), allowing it to examine whether body scanning had similar effects to those from a task that should interfere with imagery-based aspects of craving (guided imagery), and whether body scanning and guided imagery produced differential effects from a mind wandering control.

Method

Participants

Participants were recruited from Plymouth University's Psychology student pool and received participation credit for their participation, which they could use in their own research. The experiment was conducted in accordance with the ethical guidelines of the British Psychological Society and had approval from the University's Faculty of Science and Technology Ethics Committee. Ninety-eight participants (75 female, 23 male, *M* age = 20, range = 18–45) took part.

Assessment instruments

A *single-item craving intensity measure* (0, no craving, to 10, intense craving) was used for repeated measurements during the experimental phase of the study. Before and after the imagery task, the *Craving Experience Questionnaire* (CEQ; May et al., submitted for publication) was used to measure the strength of food craving (CEQ-S), and the frequency of craving thoughts (CEQ-F). The CEQ-S and CEQ-F each have 10 items, over three subscales measuring craving intensity, use of imagery and intrusiveness. Using data from 12 studies on chocolate, other food, alcohol and cigarettes, May et al. (submitted for publication) found that the internal structure of the CEQ was robust across substances and timeframes over which desires were assessed, and that internal consistencies of the total CEQ-S and CEQ-F were high. CEQ-S items focused on current craving. At baseline, participants completed the CEQ-F on the frequency of cravings since they last ate: at the end of the session, they rated the frequency of cravings during the session.

The *Eating Attitudes Test* Factor 1 (EAT26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used to identify whether any participants screened positive for an eating disorder, while a *Brief Mindfulness Measure* (*BMM*; Berry et al., 2010) and an *Emotional and Behavioural Reactions to Intrusions Questionnaire* (EBRIQ; Berry et al., 2010) checked whether levels of trait mindfulness and usual reactions to intrusive thoughts were equivalent across conditions.