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Research report

Effects of distraction and focused attention on actual and perceived food intake in females with non-clinical eating psychopathology

Stacey Long [a], Caroline Meyer [a], Newman Leung [a,b], Deborah J. Wallis [a,*]

[a] Loughborough University Centre for Research into Eating Disorders, Loughborough University, Loughborough, Leicestershire LE11 3TU, UK
[b] Birmingham and Solihull Mental Health NHS Trust, UK

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ABSTRACT

The aim of this study was to determine the effects of distraction and focused attention on both food intake and accuracy of perceived intake in women with non-clinical levels of disordered eating. In a laboratory study, twenty-seven young women consumed three identical pasta meals once a week for three consecutive weeks. Meals were eaten ad libitum during a control and two test conditions, in which attention was either diverted away from (distraction condition) or directed towards food-related stimuli (focused attention condition). They also completed the drive for thinness, bulimia and body dissatisfaction subscales of the Eating Disorders Inventory-2. Intake was significantly higher in the distraction than in the control or focused attention conditions, but was not related to eating psychopathology. A measure of accuracy of perceived intake indicated that drive for thinness was associated with overestimation of food intake in the focused attention condition. This study suggests that distraction could promote food intake in all non-clinical consumers, irrespective of individual differences in eating behaviours. Furthermore, it suggests that those with a high drive for thinness may overestimate intake when required to focus on their food. These findings could have implications for mealtime interventions in the treatment of eating disorders.

Introduction

For those involved in the care of patients with eating disorders, reaching a healthy BMI via increasing caloric intake is a common treatment goal (Fairburn & Harrison, 2003). Whilst there is a paucity of evidence from within the eating disorders field, it is clear from the appetite literature that environmental influences are important in predicting amount of food consumed (e.g. Wansink, 2010; Wansink & Sobal, 2007). The aim of the present study was to investigate the effects of different environmental conditions (distraction and focusing attention on food) on food intake and perceived food intake in those with varying levels of non-clinical eating psychopathology.

Both food-related and non-food-related environmental factors can affect meal size. Food-related factors include portion size and variety of foods offered, and non-food related factors include the presence of others, audio and audio-visual distractors and other aspects of the immediate mealtime environment (Wansink, 2010; Wansink & Sobal, 2007). Naturalistic studies have found that music (e.g. Stroebele & de Castro, 2006) and the presence of others (e.g. de Castro, 1990, 1997) are associated with increased intake. Distraction-related increases in food intake have also been seen within laboratory experiments, including when food is consumed alongside watching television (Bellisle, Dalix, & Slama, 2004; Blass et al., 2006; Hetherington, Anderson, Norton, & Newson, 2006) and playing video games (Cessna, Raudenbush, Reed, & Hunker, 2007). In contrast, focusing attention on the sensory properties of eaten foods can promote reduced intake relative to distracting conditions (e.g. Hetherington, Foster, Newman, Anderson, & Norton, 2006). This distraction-related overconsumption tends to occur in all individuals. However, several studies have also considered dieting and restrained eating within this context.

Restrained eating is a construct that refers to an individual's conscious attempt to limit food intake in order to control body weight (Herman & Mack, 1975). This close monitoring of intake can be abandoned under certain conditions, including distraction, producing enhanced intake relative to non-distracting conditions. There is evidence that restrained eaters consume more than non-restrained individuals under distraction (e.g. Ward & Mann, 2000). Similarly, Bellisle and Dalix (2001) found that cognitive restraint was associated with increased intake under distraction (listening to a recorded story) compared with a control condition. In this study, they also included a condition in which participants' attention was focused on the sensory properties of the eaten foods.

* Corresponding author.
E-mail address: D.Wallis@lboro.ac.uk (D.J. Wallis).

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Although intake was lower than in the distraction condition (and similar to a control condition), this difference was not significant (in contrast with Hetherington, Foster, et al., 2006). A positive correlation between restraint score and the difference in intake between control and distraction conditions indicated that those with higher levels of restraint are particularly susceptible to the effects of distraction on food intake. However, not all studies of the impact of distraction on eating have found that it is associated with enhanced intake (e.g. Bellisle, Dalix, Airinei, Hercberg, & Péneau, 2009).

A number of processes relating to the allocation of attentional resources have been proposed to explain the effects of distraction and focused attention on food intake. When encouraged to focus on the sensory properties of foods this seems to promote reduced intake relative to distracting conditions (e.g. Hetherington, Anderson, et al., 2006; Hetherington, Foster, et al., 2006). However, when attention is narrowed towards non-food-related cues, disinhibition of intake is promoted. If these distractions are cognitively demanding this attentional challenge can impair the ability of restrained eaters to inhibit food intake via the allocation of cognitive resources to the distracting stimuli (e.g. Wallis & Hetherington, 2004; Ward & Mann, 2000), thus leaving them vulnerable to disinhibition. It has also been suggested (e.g. Higgs & Woodward, 2009) that this allocation of attentional resources may disrupt satiety cues or divert attention away from the physiological signals associated with ingestion of foods. Specifically, Higgs and Woodward (2009) proposed that when distracted during eating, the memory of the meal may not be encoded as it would have been without the distraction, leading individuals to consume more in subsequent eating episodes after being distracted during a previous meal.

However, not all studies of the effects of distraction have found that restrained eaters are particularly susceptible (Bellisle et al., 2004, 2009). Bellisle et al. (2009) conclude that their failure to replicate their earlier findings may have been due to a high intake in the control condition limiting the possibility of obtaining a distraction effect. This limits the conclusions that can be drawn from these equivocal findings, and suggests a role for replication and extension of these studies in order to clarify the contribution of individual differences in eating behaviours to distraction-related overconsumption.

Although restraint-related food intake has been examined in the context of distraction and focusing attention on food, no studies to date have examined the influence of other types of non-clinical eating psychopathologies. The present study aims to extend previous research by investigating the effects of distraction and focused attention on females differing in drive for thinness, body dissatisfaction and bulimic attitudes (as measured by the EDI-2; Garner, 1991). Importantly, it has been suggested that dietary restriction might precede the development of eating disorders (Delinsky & Wilson, 2008). For this reason, the relationships between distraction, focused attention and eating psychopathology deserve further investigation. An additional measure of behavioural awareness will compare amount of the meal consumed against estimated amount consumed in order to assess the degree to which participants are aware of how much they consume under the different conditions. Ward and Mann (2000) used a similar measure, and found that although there was a slight underestimation under low cognitive load and a slight overestimation under high cognitive load (memory task), these differences were not significant. However, it is not known if any individual differences in disordered eating behaviours are associated with the ability to monitor food intake.

In summary, previous research from the appetite field has suggested that environmental distractors can increase food intake, and focusing attention on the sensory properties of food can promote reduced food intake relative to distracting conditions. Some evidence suggests that these effects appear to be especially relevant to those individuals who are deliberately trying to limit their intake (restrained eaters). However, we do not know the effects of these conditions on other aspects of eating psychopathology. Furthermore, to date, no studies have examined eating behaviour-related individual differences in ability to accurately estimate amount of food consumed under these different conditions.

This study had three aims. The first was to replicate previous findings concerning the effects of distraction and focused attention on food intake. It was predicted that participants would consume significantly more when distracted than when attention is focused on the sensory characteristics of food and under control conditions. Second, this study aimed to expand on previous literature concerning dietary restraint and intake by assessing the relationship between food intake during control, distraction and focused attention conditions among women differing in non-clinical levels of eating psychopathology. It was hypothesised that there would be a significant relationship between eating psychopathology scores (eating-related subscales of the EDI-2) and differences in intake between distraction and both focused attention and control conditions. Finally, this study examined the behavioural awareness (accuracy of intake estimations) of non-clinical females differing in eating psychopathology. It was hypothesised that the ability to estimate accurately the amount of food consumed would differ between the three conditions, and eating psychopathology scores would be associated with low behavioural awareness (i.e. over- or underestimation of amount consumed). However, as this is a novel research question, there were no specific predictions relating to each condition.

Method

Participants

Twenty-seven young female volunteers were recruited on an opportunity basis through a British University with the incentive of receiving course credits, a standard procedure within experimental research. Participants were screened for eating pathology (those with a self-reported history of clinically diagnosed eating disorders were excluded from participation) and were not taking any medication, with the exception of oral contraception. One individual was excluded after reporting having been previously treated for an eating disorder. Mean age of participants was 21.1 (SE = 0.7; range 18–31) and mean BMI was 23.8 (SE = 0.64, range = 19.3–35.2). The experiment was conducted in the Loughborough University Eating Behaviours Laboratory according to the British Psychological Society ethics guidelines, and was approved by the Loughborough University Ethical Advisory Committee. Written informed consent was obtained from all participants prior to participation.

Procedure

A week before the first test session, participants attended a screening session in which they completed a questionnaire to assess their liking of the test meal and their ability to eat the food with no ill effects (i.e. no allergies). They also gave written informed consent and were provided with instructions for the following three test sessions. Participants were asked to have their usual breakfast if their test session took place at lunchtime (between the hours of 12.00 and 13.30), or their usual lunch if their test session was scheduled for early evening (between 17.00 and 18.30). Following standard protocol (e.g. Wallis & Hetherington, 2004, 2009) in order to minimise any condition differences