



Research report

Distraction, the desire to eat and food intake. Towards an expanded model of mindless eating



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ABSTRACT

This study compared the impact of different forms of distraction on eating behaviour with a focus on the mechanisms behind this association and the link between the amount consumed and changes in the desire to eat. Participants ($n = 81$) were randomly allocated to four conditions: driving, television viewing, social interaction or being alone in which they took part in a taste test. Measures of the desire to eat (i.e. Hunger, fullness, motivation to eat) were assessed before and after the intervention. The results showed that those watching television consumed more than the social or driving conditions. Food intake was associated with a decreased desire to eat for those eating alone, but was unrelated to changes in the desire to eat for those driving. Watching television also created a decrease in the desire to eat commensurate with food intake whereas social eating resulted in the reverse relationship. The results are discussed in terms an expanded model of mindless eating and it is argued that eating more requires not only distraction away from the symptom of hunger but also sufficient cognitive capacity left to attend to the process of eating.

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Introduction

Although the literature indicates a role for biological factors in the regulation of food intake (e.g. Mercer & Speakman, 2001; Pinel, 2011) much research highlights that the desire to eat and eating behaviour are influenced by a multitude of psychological factors (see Conner, 2006; Ogden, 2010 for reviews). One area that has received much attention over the past few years is the impact of distraction and the ways in which factors such as television viewing, aspects of the food environment and social interaction influence how much food is consumed. These will now be considered.

In terms of the impact of television viewing, several studies indicate that food intake in the current meal is increased when distracted by watching television (Bellissimo, Pencharz, Thomas, & Anderson, 2007; Temple, Giacomelli, Kent, Roemmich, & Epstein, 2007). Similarly, Higgs and Woodward (2009) showed an impact of television viewing on subsequent meals and reported that participants who ate lunch whilst watching television had less vivid memories of their lunch and consumed more in a subsequent snack tasting session compared to a control group. Furthermore, Blass et al. (2006) found that although those watching television ate significantly more food than a control group the two groups had comparable ratings of appetite. Moray, Fu, Brill, and Mayoral (2007) also concluded that estimates of food intake were less accurate if

participants were watching television whilst eating. In a similar vein research indicates that many other factors may distract from eating including listening to a story (Bellisle & Dalix, 2001; Long, Meyer, Leung, & Wallis, 2011), listening to music (Stroebele & de Castro, 2006), playing a computer game (Oldham-Cooper, Hardman, Nicoll, Rogers, & Brunstrom, 2011) and engaging in a word counting task (Boon, Stroebele, Schut, & Ijntema, 2002).

Research has also explored the ways in which aspects of the food environment can distract an individual making it easier to overeat and harder to monitor how much is being consumed (Fisher, Rolls and Birch, 2003; Rozin, Dow, Moscovitch, & Rajaram, 1998; Wansink, 2004). For example, a multitude of studies indicate that over eating can be triggered by factors such as the ambience of the room, container size, plate size, variety of food and perceived time of day (Stroebele and de Castro, 2006; Wansink et al., 2006; Wansink, van Ittersum and Painter, 2006; Wansink & Park, 2001). In particular, research indicates that the environment distracts the individual and that not only do people make automatic decisions to eat without any conscious processing, they also deny that the environment has an impact of their food intake (Wansink, 2004; 2009; Wansink and Kim, 2005; Wansink and Sobal, 2007). This process has been termed 'mindless eating' and can be contrasted with 'mindful' eating when people are encouraged to self monitor and process what they eat (Wansink and Sobal, 2007).

Research has also addressed the impact of social influence on eating behaviour and several studies indicate that that people tend to eat more food in the presence of others or in groups rather than

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when eating alone (Berry, Beatty, & Klesges, 1985; de Castro, 1991; de Castro & Brewer, 1992; Hirsch & Kramer, 1993; Patel & Schlundt, 2001; Redd & de Castro, 1992). In line with research on television viewing it has been argued that social influence is also a type of distraction, as attention is generally diverted away from the meal to concentrate on actions such as talking and interpreting information (Hetherington, Anderson, Norton, & Newson, 2006). In contrast, however, it has been suggested that social influence functions via the expectations of the experience itself. For example Klesges, Bartsch, Norwood, Kautznan, and Haugrud (1984) argued that eating with others is regarded as a pleasant event, whereas eating alone is considered a response to overcoming hunger (Herman, Roth, & Polivy, 2003). Accordingly, such expectations change food intake. Similarly, Feunekes, de Graaf, and van Staveren (1995) suggested that people predict that they will overeat in the presence of others which in turn becomes a self fulfilling prophecy. This could be as a result of expecting to be eating for a longer period of time when in the presence of others as shown in de Castro's time-extension hypothesis (1990), theorising that the more people present during a meal; the longer the duration of the meal and the greater the food intake (e.g. Bellisle, Dalix, & de Castro, 1999; de Castro, Bellisle, Feunekes, Dalix, & de Graaf, 1997; de Castro, Brewer, Elmore, & Orozco, 1990).

Not all research, however, shows an increase in food intake in social situations and studies indicate that this effect is influenced by the relationships with the other people eating. For example, when the other person(s) present is a stranger, the social facilitation of eating tends to be weaker or even absent (Clendenen, Herman, & Polivy, 1994; de Castro, 1994; Hetherington et al., 2006; Salvy, Jarrin, Paluch, Irfan, & Pliner, 2007). This may be a result of impression management and the desire to be seen in a positive light in front of strangers (Leary & Kowalski, 1990; Tice, Butler, Muraven, & Stillwell, 1995). Mori, Chaiken, and Pliner (1987), however, argued that impression management is just as likely to take place between familiar companions of the opposite sex, especially if they find each other desirable. Similarly, Wansink and Park (2000) reported that whereas women decrease their food intake as an attempt to appear more feminine, men consider overeating to be a sign of masculinity and power.

Research has also highlighted possible mechanisms for the impact of distraction on food intake with a particular focus on memory. For example, it has been argued that distraction divides an individual's selective attention away from the encoding of the meal and interrupts episodic memory formation (Boon et al., 2002; Brunstrom & Mitchell, 2006; Chun & Turk-Browne, 2007; Stroebele & de Castro, 2006; Ward & Mann, 2000; Long, Meyer, Leung and Wallis, 2011; Moray et al., 2007). In line with this, Herman and Polivy expanded their boundary model of eating to include a role for memory and reported that when the amount consumed by participants was made salient by leaving the wrappers of the sweets nearby, participants were more aware of how much they had eaten and consequently ate less than those who couldn't see any wrappers (Polivy, Herman, Hackett, & Kuleshnyk, 1986). In a similar vein, research indicates that reminding participants of recent meals makes the memories of these meals more apparent which in turn suppresses subsequent food intake (Higgs, 2002; Higgs, 2005; Higgs, 2008; Higgs, Williamson, & Attwood, 2008a). Research also shows that lacking a memory of meals or having impaired memory such as amnesia can increase food intake (Higgs, Williamson, Rotshein, & Humphreys, 2008b; Rozin et al., 1998).

Research has therefore explored the impact of distraction on food intake with a focus television viewing, the food environment and social interaction. Such studies, however, have tended to explore the impact of individual forms of cognitive distraction compared to a control condition of no distraction, rather than making comparisons across different manipulations of cognitive capacity.

In line with this, the present experimental study aimed to compare across three different forms of distraction which varied in the extent to which they utilised an individual's cognitive capacity and to assess their relative impact on eating behaviour. In particular, the study focused on two common distractions, namely, television viewing and social interaction and compared them with the impact of driving as although research indicates that eating whilst driving increases the risk of a crash due to a decrease in eye contact, attention to the road and taking the participants' hand off the wheel (Stutts et al., 2005; Young, Mahfoud, Walker, Jenkins, & Stanton, 2008), little is known about the reverse affect of driving on eating. Therefore these three forms of distraction were compared to a control condition of eating alone.

Some previous studies have also attempted to address the mechanisms behind the link between distraction and eating with a focus on memory. Although, providing some insights into the ways in which distraction may influence food intake the emphasis to date has been on distraction as a trigger to the onset of eating behaviour and food choice rather than eating as an ongoing behaviour. At its simplest, eating behaviour is a classic example of a negative feedback system as it is driven by factors such as hunger and a desire to eat which are in turn modified and reduced once food has been consumed causing a sense of fullness or satiety (Blundell, 1979; Blundell & Burley, 1987). From this perspective, it is therefore hypothesised that not only does distraction trigger the onset of eating it distracts from the consequences of this eating, thus making changes in hunger and/or fullness harder to detect. The present study therefore explored the impact of distraction on the relationship between food intake and subsequent changes in hunger and the desire to eat. This finds reflection in the suggestion that as well as inhibiting memory, distraction may also inhibit our attention to signals of satiety which remains untested (Wansink, 2009). It is also parallel to the notion of hunger as a symptom which is perceived and modified through processes such as mood, attention and social influence (Ogden, 2007; Roberts & Pennebaker, 1995; 2010). Accordingly, it was predicted that distraction would result in increased eating behaviour and that different forms of distraction would have differing effects on the amount consumed. In addition, it was also predicted that distraction would disrupt the relationship between food intake and a reduction in the desire to eat as participants would be less able to monitor the impact of any food consumed on their perceptions of hunger. No specific predictions were made as to which condition would be the most distracting or whether the mechanisms linking distraction with changes in food intake would be consistent or different across the different forms of distraction being manipulated.

Method

Sample

Female participants ($n = 81$) ranging in age from 18 to 40 years took part in the study. Their mean age was 22 years ($SD = 5.18$), the majority were white ($n = 71$ (87.7%)) and full time students ($n = 59$ (72.8%)). Men were not included as there are clear gender differences in food intake in terms of quantity and food preferences relating to factors such as the impact of emotional and restrained eating and the menstrual cycle which would have required gender to be an additional independent variable, thus requiring twice the sample size. Inclusion criteria were: female, aged over 18 and in possession of a full manual driving licence.

Design

The study used an experimental design with four independent conditions in which food was consumed: driving, watching

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