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Research report

Triggers of eating in everyday life

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ABSTRACT

Understanding the triggers of eating in everyday life is crucial for the creation of interventions to promote healthy eating and to prevent overeating. Here, the proximal predictors of eating are explored in a natural setting. Research from laboratory settings suggests that restrained eaters overeat after experiencing anxiety, distraction, and the presence of positive or negative moods, but not hunger; whereas the only factor that triggers eating in unrestrained eaters is hunger. In this study, 137 female participants reported hourly for 2 days on these potential predictors and their eating using electronic diaries, allowing us to establish the relationships between these factors while participants went about their normal daily activities. The main outcome variables were the number of servings eaten and whether or not food was eaten. Contrary to findings from laboratory settings, in everyday life restrained eaters (1) did not overeat in response to anxiety; (2) ate less in the presence of positive or negative moods; and (3) ate more in response to hunger. The relationships between these factors and eating among unrestrained eaters were closer to those found in laboratory settings. In conclusion, predictors of eating must be studied in everyday life to develop successful interventions.

Introduction

What causes individuals to eat? Although physiological factors play an important role in human eating, the eating at any particular meal is influenced by a variety of psychological factors. These factors can lead dieters to experience lapses in self-control and subsequent weight fluctuation and can lead non-dieters to overeat and gain weight that is difficult to lose. Comprehensive understanding of the factors that trigger eating is of use to both dieters and non-dieters and may lead to the development of beneficial weight loss strategies.

Current knowledge of the proximal predictors of eating and overeating comes partly from laboratory studies that compare the eating of restrained eaters to that of individuals who are not restrained eaters. Restrained eaters are concerned about "keeping their weight down," (Herman & Polivy, 1975, p. 668) and can be thought of as chronic dieters. They impose cognitive controls on their eating and aim to ignore the physiological signal of hunger. Restrained eaters frequently fail at their attempts to restrict their eating in response to triggers that tend to have the opposite association – or no association – with the eating habits of non-restrained eaters.[1] As we review below, restrained eaters overeat in response to distraction and both positive and negative emotions. Their eating does not tend to show strong associations with hunger (for a summary, see Herman & Polivy, 1984). In contrast, non-restrained eaters tend to eat more when they are hungry, less when they are distracted, and their eating is not influenced by emotions.

The relationship between emotion and eating has been explored in laboratory studies as well. Several studies have examined the effects of anxiety[2] on eating among restrained and unrestrained eaters (see Greeno & Wing, 1994, for a summary). These studies have consistently shown that restrained eaters consume more when anxious than when not anxious, while unrestrained eaters either consume less when anxious than when not anxious, or are unaffected by anxiety. Studies using mood inductions have also found that food intake among restrained eaters increases with other negative moods, such as depression and anger (Cools, Schotte, & McNally, 1992; Frost, Goolkasian, Ely, & Blanchard, 1982; Schotte, Cools, & McNally, 1990; Ruderman,

[1] There is disagreement over whether restrained eaters are *by definition* prone to disinhibited eating in certain situations, or whether there are sub-types of restrained eaters, only some of which are prone to disinhibited eating. This debate is beyond the scope of the current manuscript.

[2] Some of these studies refer to stress rather than anxiety, but regardless of the conceptualization or the label, stress or anxiety both lead to overeating among restrained eaters.

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1985), and also with positive mood inductions, such as humor (Cools et al., 1992). Unrestrained eaters are generally unaffected by these mood inductions (Cools et al., 1992; Ruderman, 1985; Schotte et al., 1990).

In line with the viewpoint that people need to pay attention to themselves and their goals in order to control their behaviors, (Carver & Scheier, 1998), studies have shown that restrained eaters overeat while listening to the radio (Bellisle & Dalix, 2001) or engaging in a cognitively distracting task (Lattimore & Caswell, 2004;[3] Ward & Mann, 2000), whereas unrestrained eaters tend to eat less in such situations. Further supporting the notion that attention is necessary if one is to control one's eating, restrained eaters who had been given a preload did not overeat if they were forced to pay close attention to their behavior (Polivy, Herman, Hackett, & Kuleshnyk, 1986). More recent work, however, suggests that attention does not necessarily lead to overeating among restrained eaters, but rather interacts with situational cues to predict consumption (Mann & Ward, 2004). Restrained eaters who are distracted will only overeat if there are salient cues to eat present. If salient cues promote dieting, restrained eaters will consume less.

While these laboratory studies give us causal information about factors that influence eating when one is *required* to eat, it is not clear if these findings accurately explain real-life eating outside of the lab, nor do they inform the question of when individuals choose to eat. Studies of eating in more natural settings can begin to address such questions. These studies necessarily lack the tight controls of the laboratory environment and because participants must report on their own eating, it is not possible to keep them unaware that eating is a focus of the study. Despite these concerns, field studies of eating are an important and necessary complement to laboratory studies.

Many naturalistic eating studies require individuals to report on factors that influenced their eating months after the eating took place (e.g., Grilo, Shiffman, & Wing, 1989); or require them to report several weeks worth of eating at the end of that time frame (e.g., Baker, Little, & Brownell, 2003). The validity of these retrospective reports is questionable, as memory of food consumption may be biased by many factors, including self-presentational concerns, current mood, beliefs about factors that influence eating, and past behaviors (see Stone & Shiffman, 1994, for a discussion of these issues). Because individuals may not be able to accurately recall the time sequence of eating and the factors that are presumed to cause that eating, these studies cannot be used to establish proximal predictors of eating.

A newer methodology has been used to examine factors associated with diet relapse among obese individuals on formal diets (Carels, Douglass, Cacciapaglia, & O'Brien, 2004; Patel & Schlundt, 2001; Schlundt, Sbrocco, & Bell, 1989), as well as eating among large populations of individuals who are not necessarily dieting (see de Castro, 2000, for a review). This method requires individuals to use paper and pencil diaries to report every instance of eating when it happens. At that time, they are also expected to report various situational factors that may be linked to a dietary lapse. While more rigorous than the studies that require retrospective reporting, the methodology has two weaknesses. First, the incident that triggers participants to complete a food diary is the dietary lapse, so any factors reported at that same time may have been a result of the dietary lapse rather than a cause of it. Further, researchers do not conduct analyses exploring predictors at one time point and eating at later time points. Because diaries are only completed when eating occurs, no information is collected about the overall presence of various triggers, or about situations that enable individuals to refrain from eating (except in the work of de Castro, who also collected diary entries at random points throughout the day). Second, it is still possible with this methodology for participants to complete all the forms at the end of the day—or even at the end of the entire study. This problem poses a threat to the reliability of these findings, because if the potential trigger and the eating are both reported later in the day or week, it will be difficult for the participant to accurately assess which came first, or even if the trigger was present at all.

Despite these limitations, as well as the fact that participants in these studies monitor and record every item they eat, these studies provide information about eating in a natural environment and they have explored some of the same factors as the laboratory studies. All four of the studies of obese dieters replicated the laboratory finding (Cools et al., 1992; Frost et al., 1982; Ruderman, 1985, 1986; Schotte et al., 1990) that negative moods are associated with dietary lapses and three of them replicated the finding (Cools et al., 1992) that positive moods are associated with dietary lapses (all except Schlundt et al., 1989). Of the three studies that explored the role of hunger, two (Carels et al., 2004; Schlundt et al., 1989) replicated the laboratory findings (Herman & Polivy, 1975, 1984) that hunger was not associated with overeating among dieters, while one found that hunger was associated (Carels et al., 2001). An additional study of general population eaters found that hunger was associated with amount eaten, although the participants were not necessarily dieting (de Castro & Elmore, 1988).

The newest generation of research on eating has aimed to reduce the problems associated with laboratory contexts, as well as those associated with paper and pencil diary studies, by using an ambulatory electronic diary methodology that participants complete at certain times while going about their normal daily activities. Electronic diaries benefit from time-stamp and lock-out features that provide information about when the diary was actually completed and prevent retrospective responding. They also provide an added guarantee of confidentiality by having potentially sensitive information disappear immediately into computer memory, accessible only to research staff. Previous studies suggest that this methodology has not been found to significantly alter the participant's normal activities (e.g., Larson, 1989).

Studies using this methodology have examined the prevalence of eating disorder symptoms among individuals with eating disorders (Stein & Corte, 2003), as well as predictors of binge eating among individuals with binge eating disorder (Freeman & Gil, 2004; Greeno, Wing, & Shiffman, 2000; Wegner et al., 2002). Despite being ideally suited for the exploration of the proximal predictors of eating in everyday life, these methods have not yet been applied to such questions or used to examine these eating triggers in individuals without significant eating pathology (see Smyth et al., 2001, who recommend that eating research use this methodology).

The current manuscript reports the first study, to our knowledge, to comprehensively assess several proximal triggers of eating in everyday life using a methodology that prevents retrospective reporting. We use an ambulatory electronic daily diary methodology in which participants report on their eating and an array of potential eating triggers every hour over a 2-day period. By requiring participants to report on these triggers whether or not they ate, this methodology allows us to assess which triggers were present in the environment just prior to each instance of eating, as well as whether those triggers were present when participants did not eat. To minimize the salience of eating during the study, as well as the extent to which participants must self-monitor their eating, participants respond to only three questions about their eating, a question about whether they ate at all, a question about how many servings they ate, and a question about whether the food was high,

[3] The authors refer to the reaction time task as an active coping stress task.