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Research report

Expectations, mood, and eating behavior in binge eating disorder. Beware of the bright side

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ABSTRACT

Sad people may indulge in fattening snacks because they *believe* that eating will repair their mood. To test whether (1) changes in expectations and mood had an effect on caloric intake and (2) depressive symptoms moderated caloric intake, 73 women with binge eating disorder were randomly assigned to a condition in which expectations about food and emotion were either confirmed or disconfirmed. Subsequently they were shown either an upsetting or an amusing movie clip followed by a taste task. Contrary to our expectations, there were no differences in the four conditions: participants in all four conditions ate comparable amounts of calories. Manipulation of expectations or mood had no effect on caloric intake. However, higher baseline expectations that food is pleasurable and useful as a reward resulted in a higher caloric intake after positive mood induction. Non-depressed individuals ate less after a negative mood induction than did depressed individuals. Interestingly, they also ate less than the group of individuals, depressed and not, whose mood was positively induced. Non-depressed individuals seem to use healthier coping strategies: negative affect signals that the environment poses a problem. Positive affect on the other hand signals that the environment is benign, and thus makes people less vigilant about food intake.

Introduction

Negative mood states influence eating behaviors in patients with binge eating disorder (BED). Several cross-sectional and therapy outcome studies suggest that depressive symptoms (trait), acute negative mood (state), and binge eating behavior are related (Antony, Johnson, Carr-Nangle, & Abel, 1994; Dingemans, Spinhoven, & Van Furth, 2007; Grilo & Shiffman, 1994; Grilo, Masheb, & Wilson, 2001; Mussell et al., 1996; Peterson, Thuras, Crow, Mitchell, & Miller, 2005; Stice et al., 2001; Telch & Agras, 1994). There are indications that more severe binge eating is related to higher levels of depression (Antony et al., 1994; Grilo et al., 2001; Stice et al., 2001). Binge eating might serve as an attempt to manage of alleviate negative affect (Heatherton & Baumeister, 1991). The findings about the causality of mood and binge eating however are inconclusive. Four experimental studies (Agras & Telch, 1998; Chua, Touyz, & Hill, 2004; Munsch, Meyer, Margraf, Michael, & Biedert, 2008; Telch & Agras, 1996a) investigated the causal relation between mood and binge eating in patients with BED. One study (Chua et al., 2004) found that acute negative mood elicited increased eating in patients with BED compared to a neutral mood. Three other studies did not find differences in calories consumed following negative or neutral mood induction (Telch et al., 1996a; Agras et al., 1998; Munsch et al., 2008). One hypothesis was that negative mood might influence BED participants' perception of their eating behavior, and therefore lead to the labeling of an eating episode as a binge (Telch & Agras, 1996b; Agras et al., 1998). Another suggestion was that binge eating often occurs in negative moods because eating decreases negative mood rather than negative mood being a trigger for binge eating (Munsch et al., 2008).

The pervasiveness of the association between emotional distress and binge eating suggests that the question is not *whether* but *how* negative affect leads to overeating. Sad people often indulge in fattening snacks because they *believe* that eating repairs their mood (Deaver, Meidinger, Crosby, Miltenberger, & Smyth, 2003; Macht & Mueller, 2007; Tice, Bratslavsky, & Baumeister, 2001). Behavior, and especially persistent efforts to control oneself, are strongly influenced by people's expectations and cognitions about how self-control works (Martijn, Tenbult, Merckelbach, Dreezens, & de Vries, 2002). People tend to abandon or violate their normal self-regulatory efforts because they give priority to affect

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regulation. It might be hypothesized that they *expect* that fattening foods will improve their mood.

Several authors have stated that eating, apart from physiological, environmental and social cues, may be affected by and associated with emotions (Desmet & Schifferstein, 2008; Dunn, Mohr, Wilson, & Wittert, 2008; Greeno & Wing, 1994; Macht & Dettmer, 2006; Macht & Simons, 2000). For example in everyday life frequent associations between food and emotions are made. An example is the recently launched media campaign by Mars® in which the name "Mars®" is temporarily replaced by "happy", "love," or "feel good" on the wrapper of the well-known chocolate bar. Frequent exposure to these kinds of messages in the media and elsewhere influences people's expectations regarding food and mood. The expectancy learning theory postulates that one forms expectations of the consequences of various behaviors as a result of one's learning history (Smith, Simmons, Flory, Annus, & Hill, 2007). These expectations influence future behavioral choices. Expectations about the consequences of a given behavior are the sum of one's learning history and are thus the cognitive mechanism by which prior learning leads to subsequent behavior. The temporal association of negative affect with binge eating implies that perhaps bingers have learned to anticipate reduction of distress from binging (Hohlstein, Smith, & Atlas, 1998). The expectation that eating helps to alleviate affect might predict increases in binge eating (Stice, 2001). Binge eating is therefore likely to be the result of extreme expectations (Smith et al., 2007). Individuals with bulimic symptoms appeared to differ from individuals with anorexic symptoms and controls in their expectations that eating would help them regulate their negative affect. Psychiatric and normal control participants generally did not differ from each other, indicating that expectations scores do not reflect general psychiatric distress (Hohlstein et al., 1998).

The aim of the present study was to test the relationship between expectations regarding the effect of eating on mood, changes in mood, and actual caloric intake in individuals with BED. Our research questions were twofold:

(1) Do expectations regarding food and mood have an effect on caloric intake? We expected that participants with high expectations that food will improve mood to have a larger caloric intake when in a negative mood than participants with low expectations.
(2) Do depressive symptoms influence caloric intake and is there an interaction effect with mood induction? We hypothesized that participants with severe depressive symptoms, especially those with a negative mood induction, would have a higher caloric intake than participants with no-to-mild depressive symptoms.

Method

Participants

Participants in this study were 73 non-pregnant females between 18 and 60 years old with a primary diagnosis of binge eating disorder (BED) according to DSM-IV criteria (American Psychiatric Association, 1994) or subthreshold BED (an average of one binge eating episode a week).

To be included in the study, a participant had to report an average of one binge eating episode a week over the previous 24 weeks. Women with a subthreshold BED were also included in the study because they do not seem to differ significantly from patients with full-syndrome BED (an average of two or more binge eating episodes a week) (Striegel-Moore et al., 2000). If participants were on medication, they could participate in the study if they were stable on medication. Participants were recruited from clinics specializing in treating eating disorders ($n = 34$; 47%), by advertisements in local newspapers, and via Internet websites ($n = 37$; 53%).

The Dutch Medical Ethics Committee for Mental Health Institutions approved the study.

Measures

Demographic variables

Participants' marital status, socioeconomic status (homemaker/retired, fulltime job/student, part-time job, or disabled), educational level (low, medium, high), and age were recorded.

Eating Disorder Examination

The Eating Disorder Examination (EDE) (Cooper & Fairburn, 1987; Jansen, 2000) is an investigator-based, semistructured interview for the assessment of eating disorder-specific psychopathologies. The EDE assesses the psychopatholgy of the participant in the previous 4 weeks. It provides a comprehensive profile of individual psychopathology based on scores on four subscales: restraint (e.g., attempts to avoid certain foods), eating concern (e.g., concern about being seen while eating), shape concern (e.g., importance of body shape in self-evaluation), and weight concern (e.g., dissatisfaction with body weight). A global scale of eating pathology (computed as the mean of the participants' scores on the four subscales) is also computed to assess overall eating psychopathology. Items are rated on 7-point forced-choice scales (0–6), with higher scores reflecting greater severity or frequency. The EDE also assesses two key behavioral aspects of eating disorders: overeating and the use of extreme methods of weight control. Weight and height were also assessed and Body Mass Index (BMI) was calculated (weight/height^2).

Beck Depression Inventory-II

The Dutch version of the Beck Depression Inventory-II (Beck, Steer, & Garbin, 1988; Van der Does, 2002) contains 21 items, each with four self-evaluative statements rated on severity (scored from 0 to 3). The BDI-II measures severity of depressive symptoms. The total score is a simple sum of the 21 individual item scores and may range from 0 to 63. For patients diagnosed as having an affective disorder, the following guidelines are suggested as BDI cut-off scores: no or minimal depression, <13; mild depression, 14–19; moderate-to-severe depression, 20–28; and severe depression, 29–63. The internal consistency of the Dutch version of the BDI-II is high for a psychiatric outpatient group and a healthy control group: in tests, Cronbach's alpha was 0.92 and 0.88 respectively. Test-retest reliability correlation in the same groups was $r = 0.82$.

Taste task and food intake

During the taste task, each participant was asked to take a seat behind a table with four pre-weighted bowls with large quantities of food: chocolate ($M = 813$ g/4352 kcal, S.D. = 102 g/548 kcal), potato chips ($M = 149$ g/797 kcal), S.D. = 27 g/145 kcal), candies ($M = 616$ g/2229 kcal, S.D. = 62 g/226 kcal), and cake ($M = 464$ g/1950 kcal, S.D. 45 g/187 kcal). In the taste test, participants rated the four kinds of foods on palatability, enticement to eat, taste, and smell (Dingemans, Martijn, Jansen, & van Furth, 2009). Filling out the questionnaire gave participants a chance to consume the foods. Data were not analyzed except the item that measured how much (from 'not at all' (0) to 'very much' (5)) they liked the four kinds of food. The total amount of food left was measured afterwards and total caloric intake was calculated.