Eating Behaviors 15 (2014) 31–36

Contents lists available at ScienceDirect

Eating Behaviors

Beliefs about the emotional consequences of eating and binge eating frequency

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ARTICLE INFO

Article history:
Received 19 February 2013
Received in revised form 26 August 2013
Accepted 9 October 2013
Available online 22 October 2013

Keywords:
Eating disorders
Negative affect
Positive affect
Eating expectancies

ABSTRACT

Emotions are implicated in the etiology and maintenance of binge eating (BE). It is largely unknown whether BE is more strongly tied to emotions for certain individuals. This study investigated whether beliefs about the function of eating moderate the relationship between positive and negative affect and the frequency of BE. A mixed eating disorder sample ($n = 105$) prospectively reported their weekly BE frequency and positive and negative affect for 12 weeks after completing the Eating Expectancy Inventory. Results indicated that holding the expectancy that eating helps to relieve negative affect prospectively predicts higher frequencies of BE, and holding the expectancy that eating is pleasurable and useful as a reward predicts lower frequencies. Further, increases in negative affect were associated with increases in BE, and increases in positive affect were associated with decreases in BE. Neither of the hypothesized relationships between affect and BE was moderated by expectancies. However, an interaction between negative and positive affect was found, indicating that only the combination of high positive and low negative affect is specifically related to reduced BE. Holding specific expectancies about the function of eating and fluctuations in both positive and negative affect appear to be associated with BE among individuals with eating disorders. Cognitive interventions should target eating-related expectancies that may maintain BE behavior.

1. Introduction

Binge eating is a prominent symptom in many eating disorder presentations (Fairburn et al., 2007), and it is prevalent in non-clinical populations as well, with nearly one-quarter of college students reporting binge eating during the prior month (Lavender, De Young, & Anderson, 2011; Luce, Crowther, & Pole, 2008). In addition, it is commonly associated with distress and impairment regarding its out of control nature and perceived weight-related consequences (Striegel, Bedrosian, Wang, & Schwartz, 2012).

A number of theorists have posited functions of binge eating that attempt to account for its regular occurrence in individuals who are generally aware of its undesirable consequences. Many of these models of binge eating suggest a pattern of negative reinforcement in which binge eating temporarily alleviates an emotionally aversive state, thereby increasing the likelihood of binge eating in the future under similar conditions. Perhaps the most well-known of these models, Heatherton and Baumeister's (1991) escape theory of binge eating, states that the act of binge eating narrows one's cognitive focus on food and the act of eating, thereby decreasing his or her self-awareness. The theory asserts that individuals are more likely to binge eat when they experience aversive states of self-awareness (e.g., the emotions entailed by negative affect such as guilt, sadness, and anxiety) from which they would like to escape. Escape theory does not explicitly state that binge eating is maintained through negative reinforcement (in fact, it indicates that the aversive state of self-awareness may worsen following the binge), but because the theory suggests relief from the aversive state during binge eating, it is compatible with a negative reinforcement process.

Over the past two decades, a great deal of empirical support has accumulated for the relationship between binge eating and aversive emotional states, often described by the construct of general negative affect. In a 3- to 4-week diary study, Johnson, Schlundt, Barclay, Carr-Nangle, and Engler (1995) noted that binge eating was more likely to occur in the presence of increased negative affect than in its absence. Agras and Telch (1998) demonstrated that binge eating during a test meal is more likely to occur when individuals with binge eating disorder are distressed using an experimental mood induction. Stein et al. (2007) followed individuals with binge eating disorder for 7 days, asking them to report their moods and eating behavior via palm-top computers periodically throughout the day in a method known as ecological momentary assessment (EMA). They found that negative mood increased prior to binge eating. Smyth et al. (2007) found similar results in an EMA study of a large sample of women with bulimia nervosa followed over a period of 2 weeks, and Engel et al. (2010) recently replicated these findings in a group of women with anorexia

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http://dx.doi.org/10.1016/j.eatbeh.2013.10.012

nervosa. Thus, it is clear that binge eating is more likely to occur in the presence of negative affect than in its absence.

Positive affect, or the state of feeling enthusiastic, active, and alert, does not exist at the opposite end of the affective spectrum from negative affect (Watson, Clark, & Tellegen, 1988). In fact, Watson et al. suggest that they are two separate, orthogonal dimensions, such that an individual may have simultaneously high negative and low positive affect, experience high negative and positive affect, or any other combination. Positive affect is a putative consequence of many behaviors that are maintained through positive reinforcement (Lewinsohn & Graf, 1973). Although much research has focused on negative affect and binge eating, comparatively few studies have investigated the relationship between positive affect and binge eating. Among those that have, Johnson et al. (1995) noted that for a group of non-clinical binge eaters, binge eating episodes were associated with periods of heightened negative and positive affect. Specifically, they noted that some individuals appeared to binge eat when feeling particularly good, as if these eating episodes were celebratory. Additionally, in their detailed analysis of the timing of changes in affect and binge eating in women with bulimia nervosa, Smyth et al. (2007) found that positive affect decreased leading up to binge eating episodes and increased following them, consistent with a positive reinforcement process.

Little is known about person-level factors that influence sensitivity to the negative and positive reinforcement functions of binge eating. However, a recent analysis, combining an EMA study of women with anorexia nervosa with an EMA study of women with bulimia nervosa, found that individuals with bulimia nervosa experienced a larger decrease in guilt following binge episodes than individuals with anorexia nervosa (De Young et al., 2013). Further, individuals who tended to engage in self-induced vomiting within an hour following binge episodes, showed relatively stable levels of guilt following binge episodes, whereas individuals who tended not to engage in self-induced vomiting experienced a decrease in guilt. These findings suggest that binge eating may have different functions for different people.

Heterogeneity in the function of binge eating may complicate the interpretation of associations between affect and binge eating. For instance, searching for group level (i.e., mean) associations when binge eating may be used in an attempt to decrease negative affect on some occasions or for some individuals and be used to increase positive affect on other occasions or for other individuals may weaken the appearance of these relationships. Accounting for such heterogeneity may clarify the nature of the affect–binge eating link.

Eating expectancies are valuable constructs to evaluate for their potential to differentiate individuals by the functions of their binge eating. Expectancy theory states that expectancies are beliefs about the consequences of behavior that are the product of one's learning history (Hohlstein, Smith, & Atlas, 1998). For example, most people likely hold the expectancy that touching very hot objects with their bare skin results in pain. Expectancy theory suggests that they formed this belief through experience with touching hot objects (either directly or vicariously), and furthermore, that holding this expectancy will be predictive of them avoiding touching hot objects with their bare hands. It follows that individuals who binge eat likely hold expectancies about the consequences of this behavior that predict their continued use of it, whether because they believe it brings them pleasure or diminishes their pain. Thus, expectancies regarding the consequences of binge eating might distinguish individuals whose binge eating is associated with negative affect and those whose binge eating is associated with positive affect.

Expectancy theory does not require that expectancies be correct (Jones, Corbin, & Fromme, 2001). As a result, expectancy theory has the potential to generate useful hypotheses about binge eating even if binge eating does not actually relieve discomfort or provide enjoyment. Thus, expectancy theory emphasizes individuals' cognitions over the actual reinforcement value of their behaviors, focusing on understanding what individuals believe binge eating accomplishes rather than its actual effects.

As evidence of the importance of eating expectancies are studies demonstrating their predictive validity. In a 3-year longitudinal study, the expectancy that eating helps manage negative affect predicted the development of binge eating in adolescent girls (Smith, Simmons, Flory, Annus, & Hill, 2007). In a study of women with bulimia nervosa, the expectancy that eating is pleasurable and useful as a reward predicted a longer time to remission of binge eating (Bohon, Stice, & Burton, 2009). These studies illustrate that eating expectancies are implicated in both the development and maintenance of binge eating.

The purpose of the present study was to test whether eating expectancies distinguish individuals whose binge eating is associated with negative affect and those whose binge eating is associated with positive affect. There were two specific hypotheses. First, it was hypothesized that endorsing the expectancy that eating is negatively reinforcing (i.e., serves to manage negative affect) would moderate the relationship between binge eating and negative affect. Second, it was hypothesized that endorsing the expectancy that eating is positively reinforcing (i.e., eating is pleasurable) would moderate the relationship between binge eating and positive affect.

2. Method

2.1. Participants

Participants ($n = 113$) were women and men with eating disorders recruited from the community through internet postings and paper advertisements posted in a Northeastern city. Participants resided in 34 states and the District of Columbia. Three participants discontinued their participation before completing the first study procedure, and they are not included in any of the following descriptive information. Ninety-one (82.7%) of the participants were women. Participants' ages ranged from 18 to 62 years, with a mean (SD) of 32.68 (12.23) years and a median of 29.50 years. A total of 71.8% of participants identified their ethnicity as Caucasian, 9.1% as Asian/Pacifica Islander, 8.2% as Black/African American, 7.3% as Hispanic, 0.9% as Native American, 1.8% indicated other/mixed, and 0.9% chose not to provide this information.

Participants met the following criteria to participate: (1) at least 18 years of age and (2) the presence of an eating disorder as indicated by at least one of the following: (a) body weight below a body mass index of 18 kg/m^2 and undue influence of body weight or shape on self-evaluation, (b) the presence of purging (i.e., self-induced vomiting, laxative, diuretic, or enema misuse, or the abuse of medication such as insulin) at least once every 2 weeks and undue influence of body weight or shape on self-evaluation or marked distress about purging, and (c) the presence of binge eating episodes at least once per week and undue influence of body weight or shape on self-evaluation or marked distress about binge eating.

2.2. Measures

2.2.1. Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000)

The EDDS is a 22-item self-report questionnaire that assesses eating disorder psychopathology to derive DSM-IV eating disorder diagnoses, and it is highly specific and sensitive for this purpose (Anderson, De Young, & Walker, 2009). Two items on this measure assess body weight and shape disturbance. Participants were deemed to have satisfied the criterion of undue influence of weight or shape on self-evaluation, if they rated themselves at least a "4" on one of these 7-point scales. Two supplemental items were added to this scale for the present study to assess the magnitude of distress over the presence of purging behaviors and binge eating separately on a 7-point scale from "not at all distressed" to "extremely distressed". Participants were deemed to have indicated marked distress regarding binge eating or purging if