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Bulimics' responses to food cravings: is binge-eating a product of hunger or emotional state?

Anne Waters [a,*], Andrew Hill [b], Glenn Waller [c]

[a] *Department of Psychology, University of Southampton, Highfield, Southampton SO17 1BJ, UK*
[b] *University of Leeds, Leeds, UK*
[c] *University of Southampton, Southampton, UK*

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Abstract

This study examined the roles of hunger, food craving and mood in the binge-eating episodes of bulimic patients, and identified the critical factors involved in the processes surrounding binge-eating episodes that follow cravings. This was a prospective study of the binge-eating behaviour of 15 women with bulimia nervosa. The participants used food intake diaries and Craving Records to self-monitor their nutritional behaviour, hunger levels and affective state. Cravings leading to a binge were associated with higher tension, lower mood and lower hunger than those cravings not leading to a binge. Levels of tension and hunger were the critical discriminating variables. The findings of the study support empirical evidence and models of emotional blocking in binge-eating behaviour and challenge the current cognitive starve–binge models of bulimia. The role of food cravings in the emotional blocking model is discussed in terms of a classically conditioned motivational state. Implications for treatment are addressed.

Keywords: Bulimia nervosa; Food cravings; Affect; Hunger; Binge-eating

Multi-factorial approaches to understanding the aetiology of bulimia nervosa are both well documented (e.g., Lacey, 1986; McCarthy, 1990) and essential, given the heterogeneity of the women who develop the disorder (Striegel-Moore, Silberstein & Rodin, 1986). Specific symptoms and their triggers have been studied in depth, as attempts are made to detail the path and process of binge-eating behaviour (e.g. Abraham & Beumont, 1982; Cooper & Bowskill, 1986; Davis, Freeman, & Solyom, 1985; Cooper & Cooper, 1998; Fairburn, 1986). Distal antecedents to the

* Corresponding author. Tel.: +44-1703-595320; fax: +44-1703-592588.
E-mail address: ajw5@psy.soton.ac.uk (A. Waters).

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development of bulimia nervosa are complex, with studies focusing predominantly upon development of self-worth, family function, and societal and cultural influences (Lacey, 1986; Pope & Hudson, 1992; Striegel-Moore, 1993). Less is known about proximal antecedents and their interplay in the development and maintenance of bulimia. Two models represent the majority of research in this area — the starvation or dietary restraint model (e.g. Booth, Lewis, & Blair, 1990; Fairburn & Cooper, 1982; Polivy & Herman, 1985) and affective state models (e.g. Edelman, 1981; Shulman, 1991). These models are not competing ones, and share a number of characteristics. In particular, cognitive and environmental influences have been acknowledged within the frameworks of both models (e.g. Hill, Weaver, & Blundell, 1991; Rodin, Mancuso, Granger, & Nelbach, 1991).

To date, the starvation/dietary restraint model has been predominant in guiding research and clinical work (e.g. Cooper, 1997; Fairburn & Cooper, 1989; Vitousek, 1996). The model proposes the development of a pernicious cycle of dietary restraint, food craving and bingeing, which becomes self-maintaining (Mitchell, Hatsukami, Eckert, & Pyle, 1985; Striegel-Moore et al., 1986; Wardle, 1987; Weingarten & Elston, 1990). Within this framework, food craving is understood as a manifestation of the underlying calorific restriction imposed between the bulimic's binge-eating episodes (thus a reflection of underlying biological need), and has been cited as causally linked to the breaching of dietary restraint (Booth et al., 1990; Fairburn & Cooper, 1982). Within this model, a number of factors have been identified as triggers of binge-eating episodes. Such factors include unstructured time and being alone following a period of dietary restraint (Johnson, 1985; Pyle, Mitchell, & Eckert, 1981), breaches of dietary restraint, and the eating of "forbidden" foods (Abraham & Beumont, 1982). Mitchell et al. (1985) describe a cycle in which "binge eating interspersed between periods of minimal or little food intake" increases the likelihood of food craving and uncontrollable appetite. Recent adaptations of cognitive models have included a role for negative affect in the maintenance of bulimia nervosa, and have suggested that emotion can precipitate binge-eating episodes (Wilson, 1999). Negative affect is considered to undermine the ability to maintain strict control over eating (Fairburn, 1997). However, Wilson (1999) acknowledges the need to develop a more comprehensive model of emotional factors in understanding and treating patients with bulimia nervosa.

Although the restraint model has considerable support, empirical evidence is increasingly demonstrating that it is not a sufficient explanation (Cohen, Sherwin, & Fleming, 1987; Ruderman, 1986). Some studies have shown that hunger does not have a significant role in the craving experience (Davis et al., 1985; Hill et al., 1991) or in binge-eating episodes (Lingswiler, Crowther, & Stephens, 1989). Similarly, dietary restraint has been found *not* to lead to increased bingeing (Cooper, Clark, & Fairburn, 1993). More recent evidence suggests that the restraint model needs to be complemented by an understanding of affect-driven eating. For example, Agras and Telch (1998) found negative mood and calorific deprivation each play a role in triggering objective binge-eating episodes, while negative mood alone was critical in determining self-defined binges. These findings support the argument that negative affect plays an important part in maintaining the binge-eating cycle. Other authors have concluded that dysphoric mood precedes food craving (Cooper & Bowskill, 1986) and binge-eating in bulimics (Davis et al., 1985; Lingswiler et al., 1989). Laberg, Wilson, Eldredge, and Nordly (1991) reported both enhanced attention to pictures of food and an increase in cravings in bulimic patients when they experienced negative affect.

To summarize, food cravings, negative affect and hunger have all been cited as precipitating factors in the binge-eating cycle of bulimic patients. The relationship between these factors is complex, and their roles and interactions in precipitating and maintaining bulimic behaviour are little understood. This study aims to examine the roles of hunger, food craving and mood in the subjective binge-eating episodes of bulimic patients, and to identify the critical factors involved in the processes surrounding binge-eating episodes that follow cravings.

1. Method

1.1. Design

This was a prospective study of craving and subjectively defined binge-eating behaviour among a clinical population of bulimia nervosa patients. Participants completed a self-monitoring questionnaire each time a food craving occurred, recording relevant antecedents (affective state and hunger). Data were then divided into cravings that were followed by a binge-eating episode and cravings not followed by a binge-eating episode. Thus, the subject of the analysis was the craving (and its antecedents and consequences), rather than the participant.

1.2. Participants

The participants were a clinical sample of 15 women with bulimia nervosa (all meeting DSM-IV diagnostic criteria — American Psychiatric Association, 1994). They were recruited from the waiting lists of two Clinical Psychology outpatient departments. The mean age of the women was 24.8 years (SE=0.7) and their mean BMI score [weight (kg)/height $(m)^2$] was 22.9 (SE=1.3). Their mean score on the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979) was 24.5 (SE=3.7), indicating moderate levels of depression amongst the group.

All the women selected were volunteers, who had responded positively to a direct request for their participation in the study. It was stressed that they were free to withdraw at any time, although none chose to do so. The participants were blind to specific nature of the study, but the study was explained at the second interview. All participants were assured of confidentiality.

1.3. Measures

Two measures were completed — a food intake diary and a Craving Record. The Craving Record consisted of a standardized measure of mood state and self-monitoring sheets (used to measure the context of the craving).

1.3.1. Food intake diary

This diary was used to assess food intake (including self-identified binge-eating episodes). The diary consisted of a monitoring sheet for recording details and approximate quantities of all foods and liquids consumed, time of consumption and whether or not purging had occurred.

1.3.2. Craving Record

Food cravings and their context were measured using the Craving Record, which provided detailed information about the subjective experience of participants' food cravings. Check-lists within the Craving Record identified specific situational and affective aspects of the food craving before, while and after it occurred. Four main areas were covered: the antecedents to and context of the craving (including whereabouts, social context and triggers); the craving intensity; the nature of the food craved; and subsequent behaviour and mood state. Both general levels of hunger and mood state were also assessed within the Craving Record. Participants rated their mood and hunger levels immediately before and after the craving occurred, providing onset and post-craving measures of mood and hunger levels. Visual analogue scales were used for participants to record their levels of hunger at onset and post-craving. Mood state was assessed on the Craving Record by the UWIST Mood Adjective Checklist (Matthews, Jones, & Chamberlain, 1990). The UWIST scale has four subscales reflecting different aspects of mood state: Hedonic Tone (reflecting levels of happiness and depression); Tense Arousal (levels of tension and relaxation); Energetic Arousal (reflecting levels of high energy and tiredness); and General Arousal (a combination of participants' levels of tension and energy). The General Arousal scale was not used in the analyses, as it is made up of two of the other scales. Participants were required to choose one of four responses to indicate the extent to which they were feeling each of the emotions on the check-list (3=extremely, 2=moderately, 1=slightly and 0=not at all). Higher scores indicate higher levels of Hedonic Tone (happiness), Tense Arousal (tension), Energetic Arousal (energy) and General Arousal (overall tension and energy).

1.4. Procedure

All the participants monitored their nutritional behaviour (both food and fluid intake) for a period of seven consecutive days. They also completed a record for each food craving they experienced throughout the 7 day period, regardless of whether they subsequently ate or not. The women were instructed to complete a Craving Record sheet whenever they experienced a food craving, and to do so at the time the craving occurred. For the purpose of the study, a craving was defined as a strong urge or desire for a particular food (Hill et al., 1991). Participants' understanding of this definition was checked, in order for them to be able to "self-label" the experience if and when it arose. Within the food diary, the participants were also asked to "self-label" episodes of food consumption that they considered to constitute a binge. Consistent with one of DSM-IV criteria, a binge was defined in discussion with the participants as an episode of eating associated with a sense of loss of control. Thus, the target behaviour was self-defined bingeing, which Agras and Telch (1998) have suggested to have particular links to negative affective states.

1.5. Data analysis

Data provided by the Craving Record were divided into two groups — those cravings that were followed by a binge-eating episode and those that were not. Two-way Analyses of Variance (ANOVAs) were used to determine whether the dependent variables (UWIST scales; hunger rating) were influenced over time by whether or not a binge occurred. Thus, the two factors in the ANOVAs were Result of Craving (Binge vs No binge) and Stage in Craving (Onset vs Post),

with repeated measures on the second factor. Post hoc paired samples *t*-tests were used to determine the source of any significant interaction terms in these ANOVAs. Finally, Discriminant Function Analysis was used to determine the most parsimonious set of affective and hunger variables that were needed to differentiate craving episodes that did or did not develop into binge-eating behaviour.

2. Results

The mean number of food cravings reported by participants was 0.76 per day (SE=0.13, range=0–14 per week). The mean number of binges reported was 0.86 per day (SE=1.27, range=0–18 per week). The mean number of cravings followed by a binge was 0.41 per day (SE=0.66, range=0–10 per week).

Table 1 shows the affective and hunger ratings at the onset of each craving episode and afterwards, differentiating the episodes that did and did not develop into a binge. It also shows the results of the two-way ANOVAs [Group (binge did vs did not occur)×Time (onset vs post craving)] that were used to analyse the data. A significant difference was found between the groups on the Hedonic Tone scale of the UWIST, indicating that episodes of bingeing were associated with lower mood overall. There was no overall difference in mood across time points. However, these main effects were subsumed in a strong significant interaction of Group×Time. Post hoc analysis of this interaction showed when a craving was followed by a binge, mood deteriorated substantially (t=3.89; $p<0.001$). In contrast, when craving was not followed by a binge, mood improved significantly (t=2.29; $p<0.05$).

A significant difference was also found between the groups on the Energetic Arousal scale of the UWIST, indicating that lower energy levels were also associated with episodes of bingeing overall. Again, there was no general difference in energy levels. However, an interaction of Group

Table 1
Affective experience and hunger levels associated with cravings and resultant binge-eating

Time point	Result of craving				ANOVA		
	Binge (*N*=43)		No binge (*N*=37)		Group	Time	Group×Time
	Onset	Post	Onset	Post	*F*	*F*	*F*
UWIST scales							
Hedonic tone	8.21	4.63	11.2	13.0	26.9***[a]	2.06	19.1***
(SE)	(0.80)	(0.70)	(1.03)	(1.06)			
Energetic arousal	10.9	9.05	11.9	12.2	5.88*	1.29	4.44*
(SE)	(0.65)	(0.75)	(0.67)	(0.72)			
Tense arousal	16.50	16.63	12.76	10.86	21.40***	2.50	3.36
(SE)	(0.70)	(0.62)	(1.06)	(0.94)			
Hunger	41.93	27.02	59.19	42.16	6.28*	13.40***	0.06
(SE)	(5.79)	(4.63)	(5.77)	(5.81)			

[a] *$p<0.05$; ***$p<0.001$.

and Time was found. Post hoc analysis showed this to be due to a significant drop in energy levels when craving was followed by a binge (t=2.90; $p<0.01$). In contrast, there was no difference across time in those instances where the craving was not followed by a binge (t=0.37; NS).

The two other scales did not yield significant interaction effects. However, there were main effects that require consideration. First, a significant difference was found between the groups on the Tense Arousal scale of the UWIST, showing that higher levels of tension were associated with episodes of bingeing. Second, the groups' scores on the Hunger scale differed, although not in the expected direction. Bingeing was associated with *lower* levels of rated hunger. There was also a significant difference across time. Hunger significantly reduced across the craving experience, regardless of whether or not a binge took place. The lack of a significant interaction suggests that the degree of hunger reduction over time was equivalent across groups.

Discriminant function analysis was used to determine the most parsimonious set of variables that discriminated those craving episodes that were or were not followed by a binge. This analysis showed that the two responses (binge/no binge) could be reliably differentiated on a single discriminant function (Chi-square=16.6; *d.f.*=2; $p<.001$). That function consisted of two of the scales — Tense Arousal (F=13.5) and Hunger (F=8.49). Neither of the other two scales (Hedonic Tone and Energetic Arousal) had effects that approached significance. The single discriminant function loaded positively for Tense Arousal (coefficient=+0.91), but negatively for Hunger (coefficient=−0.75). Thus, a binge was more likely to occur in response to a craving when the individual was more tense but less hungry. The analysis successfully classified 69% of episodes (a substantial increase on the 54% that would have occurred by chance). The two variables (tension and hunger) were particularly valuable in identifying cases where bingeing took place (74%), but were also useful in identifying cases where bingeing did not occur (62%).

3. Discussion

This study has examined the roles of hunger, food craving and mood in the subjective binge-eating episodes of bulimic patients. A number of critical factors were identified in the process surrounding binge-eating. Food cravings that led to a binge were associated with lower levels of mood than cravings that did not lead to a binge. In addition, when a craving was followed by a binge, a further substantial deterioration of mood followed. In contrast, when a craving did not lead to a binge, mood improved significantly. A similar pattern was found in the energy levels surrounding craving experiences. Lower energy was associated with cravings preceding a binge, with a further reduction in energy occurring post-binge. Cravings preceding a binge were also associated with higher levels of tension. However, that tension did not reduce post-binge. Significantly, bingeing was associated with *lower* levels of hunger. A comparable reduction in hunger was found across the craving experience, regardless of whether or not a binge occurred. Levels of tension and hunger were found to be the most parsimonious factors determining the result of food craving — lower hunger and high tension being associated with cravings that lead to a binge.

What do these findings suggest about the mechanisms that are involved in the initiation of a binge-eating episode? It is important to acknowledge that the starvation/dietary restraint model (e.g. Booth et al., 1990; Fairburn & Cooper 1982, 1989; Polivy & Herman, 1985) is almost certainly necessary to explain some binges, but that it is not a sufficient explanatory construct in

this case. The present findings have shown a clear link between negative emotional states and bulimic behaviour, omitting the restrictive stage. Therefore, it is necessary to consider an affect-driven model of binge-eating. However, it should be remembered that the binges reported here were subjectively defined. Agras and Telch's (1998) findings suggest that both affect and dietary restraint would have played a part if the binges had been objectively defined.

Any adequate model of affect-related binge-eating is likely to involve several psychological processes. First, and most obviously, these results support models and empirical evidence emphasizing the role that negative affect plays in the bulimic cycle (Cooper & Bowskill, 1986; Davis, Freeman, & Garner, 1988; Laberg et al., 1991; Lingswiler et al., 1989; McManus & Waller, 1995). Such affective state models of disordered eating (e.g. Lacey, 1986; Reiser, 1990; Root & Fallon, 1989) are based in an operant conditioning paradigm, in which the blocking of the negative emotional state is highly reinforcing (at least in the short-term).

Second, this study has shown that mood has an impact against a background of craving experiences (rather than hunger), and it is important to understand the role of such cravings in binge-eating. Marlatt's classical conditioning model (1987) can clearly differentiate hunger from craving. Hunger can be seen as a motivational state arising from a general awareness of calorific deprivation. In contrast, food craving is a motivational state associated with a strong desire for an expected positive outcome, in which the target substance offering relief from the aversive state is known to the individual. Thus, the function of food craving will be to initiate bingeing as a means of obtaining relief from the aversive state of intolerable negative affect.

Finally, it is necessary to understand the apparently paradoxical finding that bingeing was associated with low levels of hunger. The reduction in experienced hunger during binges that are associated with craving and affect might be explained through the "escape" mechanism proposed by Heatherton and Baumeister (1991), where ego-threats result in both negative affect and a narrowing of attention. This state (akin to the construct of dissociation - Spiegel & Cardeña, 1991) has been linked with a reduction in awareness of internal states (e.g. van der Kolk & van der Hart, 1989). Thus, the ego-threat cognitions that drive negative affect (and hence binges) are likely to reduce general internal awareness, including one's perceived level of hunger.

To summarize, it can be hypothesized that affect-driven binges can best be explained as a result of the interplay of three psychological processes — operant conditioning, classical conditioning, and escape from awareness/dissociation. This interplay is outlined in the model presented in Fig. 1. Within this model, the association of bingeing with heightened levels of affect is a product of the operant and classical conditioning routes (blocking and craving respectively), while the association with lowered hunger may be a product of reduced awareness of internal states. It is speculated here that the common theme is that ego-threats will drive both the intolerable affect and the use of dissociation (Heatherton, Herman, & Polivy 1991, 1992).

It appears, therefore, that there may be at least two critical antecedents to binge-eating in bulimia nervosa (e.g. Grilo, Shiffman, & Carter-Campbell, 1994). One form arises from severe calorific deprivation (the model developed by Fairburn & Cooper, 1989): the other arises from the experience of ego-threats and the consequent affective states. However, any individual binge may be driven by either antecedent in isolation or by a combination of the two. Where bingeing follows food cravings, it may fulfil a different function (relief from aversive states) than bingeing following starvation (redressing calorific imbalance). At this stage, this proposed interaction between ego-threats and affective states is speculative and needs further investigation.

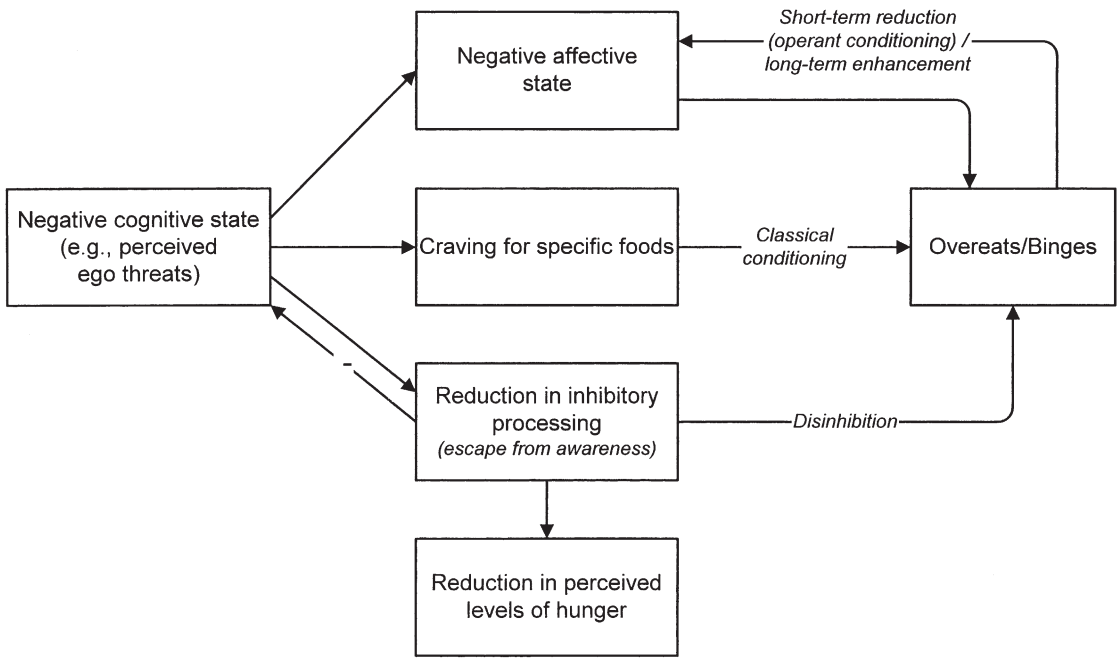

Fig. 1. A model of the psychological processes involved in non-restrictive binge-eating.

These findings highlight the important role of emotions in the link between craving and binge-eating. The principles of restraint theory underpin current popular cognitive models of bulimia, and are themselves underpinned by rules of homeostasis and dichotomous thinking (Mitchell et al., 1985; Fairburn, Cooper, & Cooper, 1986). Within such models of bulimia (e.g. Fairburn & Cooper, 1989), food craving is acknowledged as an integral part of the pernicious cycle (e.g. Mizes, 1985; Wardle, 1987), but is accepted as a homeostatic manifestation of dietary restraint. Therefore, the individual's self-statements about shape and weight are used as the central foci for treatment. The present findings suggest that resisting a craving will have a positive emotional impact. It has previously been suggested that resisting food cravings might have such an effect on mood in restrictive individuals (e.g. Slade, 1982), although this suggestion requires further investigation (Fairburn, Shafran, & Cooper, 1999). More recently, Fairburn (1997) has stressed the importance of negative affect in the binge-eating process, and Wilson (1999) has outlined its role as a proximal antecedent of binge-eating episodes. Psychological therapies may need to address affective states and their antecedents and consequences, as well as the impact of starvation. However, negative self-evaluations (emphasized in existing cognitive models), may play an important part in triggering the negative affect leading to 'emotional eating' found in recent studies (e.g., Agras & Telch, 1998). An integration of the affective state models and the starve–binge models would offer increased psychological understanding of the maintaining processes and treatment of bulimia nervosa.

References

Abraham, S. F., & Beumont, P. J. V. (1982). How patients describe bulimia or binge eating. *Psychological Medicine*, *12*, 625–635.

Agras, W. S., & Telch, C. F. (1998). The effects of caloric deprivation and negative affect on binge-eating in obese binge-eating disordered women. *Behavior Therapy*, *29*, 491–503.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders.* (4th ed.). Washington, DC: American Psychiatric Association.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression: a treatment manual.* New York: Guilford Press.

Booth, D. A., Lewis, V. J., & Blair, A. J. (1990). Dietary restraint and binge eating: pseudo-quantitative anthropology for a medicalised problem habit? *Appetite*, *14*, 116–119.

Cohen, I. T., Sherwin, B. B., & Fleming, A. S. (1987). Food cravings, mood and the menstrual cycle. *Hormones and Behaviour*, *21*, 457–470.

Cooper, M. (1997). Cognitive theory in anorexia nervosa and bulimia nervosa: a review. *Behavioural and Cognitive Psychotherapy*, *25*, 113–145.

Cooper, M. J., Clark, D. M., & Fairburn, C. G. (1993). An experimental study of the relationship between thought and eating behaviour in bulimia nervosa. *Behavior Research and Therapy*, *31*, 749–757.

Cooper, P. J., & Bowskill, R. (1986). Dysphoric mood and overeating. *British Journal of Clinical Psychology*, *25*, 155–156.

Cooper, P. J., & Cooper, Z. (1988). Eating disorders. In E. Miller, & P. J. Cooper, *Adult abnormal psychology* (pp. 268–298). London: Churchill Livingstone.

Davis, R., Freeman, R. J., & Garner, D. M. (1988). A naturalistic investigation of eating behavior in bulimia nervosa. *Journal of Consulting and Clinical Psychology*, *56*, 273–279.

Davis, R., Freeman, R., & Solyom, L. (1985). Mood and food: an analysis of bulimic episodes. *Journal of Psychiatric Research*, *19*, 331–335.

Edelman, B. (1981). Binge eating in normal weight and overweight individuals. *Psychological Reports*, *49*, 739–746.

Fairburn, C. G. (1997). Eating disorders. In D. M. Clark, & C. G. Fairburn, *Science and practice of cognitive behaviour therapy* (pp. 209–242). Oxford: Oxford University Press.

Fairburn, C. G., & Cooper, P. J. (1982). Self-induced vomiting and bulimia nervosa: an undetected problem. *British Medical Journal*, *284*, 1153–1155.

Fairburn, C. G., & Cooper, P. J. (1989). Eating disorders. In K. Hawton, P. M. Salkovskis, J. Kirk, & D. M. Clark, *Cognitive behaviour therapy for psychiatric problems: a practical guide* (pp. 277–314). Oxford: Oxford Medical Publications.

Fairburn, C. G., Cooper, Z., & Cooper, P. J. (1986). The clinical features and maintenance of bulimia nervosa. In K. D. Brownell, & J. P. Foreyt, *Handbook of eating disorders: physiology, psychology and treatment of obesity, anorexia and bulimia* (pp. 389–404). New York: Basic Books.

Fairburn, C. G., Shafran, R., & Cooper, Z. (1999). A cognitive behavioural theory of anorexia nervosa. *Behaviour Research and Therapy*, *37*, 1–13.

Grilo, C. M., Shiffman, S., & Carter-Campbell, J. T. (1994). Binge eating antecedents in normal-weight non-purging females: is there consistency? *International Journal of Eating Disorders*, *16*, 239–249.

Heatherton, T. F., & Baumeister, R. F. (1991). Binge-eating as an escape from self-awareness. *Psychological Bulletin*, *110*, 86–108.

Heatherton, T. F., Herman, C. P., & Polivy, J. (1991). Effects of physical threat and ego threat on eating behaviour. *Journal of Personality and Social Psychology*, *60*, 138–143.

Heatherton, T. F., Herman, C. P., & Polivy, J. (1992). Effects of distress on eating: the importance of ego-involvement. *Journal of Personality and Social Psychology*, *62*, 801–803.

Hill, A. J., Weaver, C. F. L., & Blundell, J. E. (1991). Food craving, dietary restraint and mood. *Appetite*, *17*, 177–185.

Johnson, C. (1985). Initial consultation for patients with bulimia and anorexia nervosa. In D. M. Garner, & P. E. Garfinkel, *Handbook of psychotherapy for anorexia and bulimia* (pp. 19–54). New York: Guilford Press.

Laberg, J. C., Wilson, G. T., Eldredge, K., & Nordly, H. (1991). Effects of mood on heart rate reactivity in bulimia nervosa. *International Journal of Eating Disorders*, *10*, 169–178.

Lacey, J. H. (1986). Pathogenesis. In L. J. Downey, & J. C. Malkin, *Current approaches: bulimia nervosa* (pp. 17–26). Southampton: Duphar.

Lingswiler, V. M., Crowther, J. H., & Stephens, M. A. P. (1989). Affective and cognitive antecedents to eating episodes in bulimia and binge eating. *International Journal of Eating Disorders*, *8*, 533–539.

Marlatt, G. A. (1987). Craving notes. *British Journal of Addiction*, *82*, 42–43.

Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: the UWIST Mood Adjective Checklist. *British Journal of Psychology*, *81*, 17–42.

McCarthy, M. (1990). The thin ideal, depression and eating disorders in women. *Behaviour Research and Therapy*, *28*, 205–215.

McManus, F., & Waller, G. (1995). A functional analysis of binge-eating. *Clinical Psychology Review*, *15*, 845–865.

Mitchell, J. E., Hatsukami, D., Eckert, E. D., & Pyle, R. L. (1985). Characteristics of 275 patients with bulimia. *American Journal of Psychiatry*, *142*, 482–485.

Mizes, J. S. (1985). Bulimia: a review of its symptomatology and treatment. *Advances in Behaviour Research and Therapy*, *7*, 91–142.

Polivy, J., & Herman, C. P. (1985). Dieting and bingeing: a causal analysis. *American Psychologist*, *40*, 193–201.

Pope, H. G., & Hudson, J. I. (1992). Is childhood sexual abuse a risk factor for bulimia nervosa? *American Journal of Psychiatry*, *149*, 455–463.

Pyle, R. L., Mitchell, J. E., & Eckert, E. D. (1981). Bulimia: a report of 34 cases. *Journal of Clinical Psychiatry*, *42*, 60–64.

Reiser, L. W. (1990). The oral triad and the bulimic quintet — understanding the bulimic episode. *International Review of Psychoanalysis*, *17*, 239–248.

Rodin, J., Mancuso, J., Granger, J., & Nelbach, E. (1991). Food cravings in relation to Body Mass Index, restraint and estradiol levels: a repeated measures study in healthy women. *Appetite*, *17*, 177–185.

Root, M. P. P., & Fallon, P. (1989). Treating the victimized bulimic. *Journal of Interpersonal Violence*, *4*, 90–100.

Ruderman, A. J. (1986). Dietary restraint: a theoretical and empirical review. *Psychological Bulletin*, *99*, 247–262.

Shulman, D. (1991). A multitiered view of bulimia. *International Journal of Eating Disorders*, *10*, 333–343.

Slade, P. (1982). Towards a functional analysis of anorexia nervosa and bulimia nervosa. *British Journal of Clinical Psychology*, *21*, 167–179.

Spiegel, D., & Cardeña, E. (1991). Disintegrated experience: the dissociative disorders revisited. *Journal of Abnormal Psychology*, *100*, 366–378.

Striegel-Moore, R. H. (1993). Etiology of binge eating; a developmental perspective. In C. G. Fairburn, & G. T. Wilson, *Binge eating: nature, assessment, and treatment* (pp. 144–172). New York: Guilford Press.

Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist*, *41*, 246–263.

van der Kolk, B. A., & van der Hart, O. (1989). Pierre Janet and the breakdown of adaptation in psychological trauma. *American Journal of Psychiatry*, *146*, 1540–1540.

Vitousek, K. M. (1996). The current status of cognitive behavioral models of anorexia nervosa and bulimia nervosa. In P. M. Salkovskis, *Frontiers of cognitive therapy* (pp. 383–418). New York: The Guildford Press.

Wardle, J. (1987). Compulsive eating and dietary restraint. *British Journal of Clinical Psychology*, *26*, 47–55.

Weingarten, H. P., & Elston, D. (1990). The phenomenology of food cravings. *Appetite*, *17*, 167–175.

Wilson, G. T. (1999). Treatment of bulimia nervosa: the next decade. *European Eating Disorders Review*, *7*, 77–83.