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**OXFORD REGIONAL TRAINING COI
IN CLINICAL PSYCHOLOGY**

Doctorate in Clinical Psychology

**Selective memory bias in the processing of
weight, shape and food related words in
women with bulimia nervosa, depression and
female non-clinical controls**

Jenny Hunt

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**Dissertation submitted in part fulfillment
of the Open University Validation Service/British Psychological Society
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Abstract

Memory bias for weight and shape related words and food related words was investigated in women with bulimia nervosa, women with depression and female non-clinical controls. The aims of this study were to investigate whether women with bulimia nervosa demonstrate memory biases congruent with their primary concerns. Furthermore, and whether such biases, reflect a general bias to recall emotional information and more specifically negatively valenced emotional information, as with depression. A further aim was to replicate the findings of Sebastian et al. (1996) that memory biases in women with bulimia are specific to weight and shape-related words and not to body words in general.

Participants listened to weight, shape and food related words, and control words. They performed a self-referent encoding task and recall memory was assessed. The results indicated that women with bulimia nervosa demonstrated a bias to recall weight and shape related words compared to other word types. Memory biases were not specific to negative weight and shape words but were also found for positive weight and shape-related words. The bulimic group did not demonstrate enhanced recall for emotional words. Memory biases for food related words were not found to be specific to women with bulimia, but were also found in women with depression. In both groups recall bias for food related words was found to be related to levels of hunger. Possible explanations and the clinical implications of these findings are discussed, and future directions for research are highlighted.

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Section 1: Introduction

The cognitive-behavioural model may be considered the most influential model in the treatment of bulimia nervosa. Cognitive theories of emotional disorders highlight the importance of information processing biases in the maintenance of clinical conditions, such as bulimia nervosa. A wealth of research in experimental cognitive psychology suggests that individuals with bulimia demonstrate attentional biases toward weight, shape and eating related information. To date, the limited research on other aspects of information processing, suggests that memory biases may also be important.

1.1: Definition of Bulimia Nervosa

Bulimia nervosa is an eating disorder characterised by repeated episodes of binge eating and inappropriate compensatory behaviour, including self induced vomiting and laxative abuse. Episodes of bingeing alternate with periods of strict dieting, in which the individual restricts total calorie consumption and avoids fattening foods (Fairburn, Z. Cooper & P. Cooper, 1986). Concerns about weight and shape are also prominent and represent the core psychopathology of bulimia nervosa. These concerns are overvalued ideas and are the main criteria by which the individual evaluates self-worth. It is these concerns which result in the use of behavioural strategies designed both to avoid weight gain and to become thinner (Fairburn & P. Cooper, 1996).

1.2: Diagnosis and Clinical Features of Bulimia Nervosa

DSM-IV (American Psychiatric Association, 1994) specifies three requirements for a diagnosis of bulimia nervosa. Firstly, that the individual engages in recurrent episodes of binge eating, in which the quantity eaten is greater than most individuals would eat in a similar period of time. Secondly, that the individual engages in recurrent inappropriate compensatory behaviour in order to prevent weight gain. Thirdly, that bingeing and compensatory behaviour occur on average at least twice a week for a minimum period of three months.

During a binge a large quantity of food is consumed in a discrete period of time, and it will usually include forbidden, fattening foods. Fairburn et al. (1986) argue that the absolute quantity of food eaten is not of primary importance, rather it is how the episode of bingeing is experienced, that is important. They note that when bingeing, individuals with bulimia nervosa describe experiencing a sense of a lack of control over their eating. This is the key defining feature of a binge. Consumption may be rapid and the binge episode may only be terminated when the individual experiences extreme stomach pain, is interrupted, vomits or runs out of food (Fairburn et al., 1986).

Bingeing may be triggered by a range of events or by emotional experiences, such as low mood. Initially, bingeing alleviates dysphoria but is followed by feelings of depression, guilt and self disgust. Fairburn & P. Cooper (1996) suggest that such feelings of depression are a secondary psychological response to loss of control. Loss of control over eating, leads to intense anxiety that the binge will result in weight gain, and this anxiety triggers the compensatory behaviour designed to counteract the effects of bingeing.

Two subtypes of bulimia nervosa, purging and non-purging are specified by DSM-IV. Individuals with the purging type engage in behaviours such as self-induced vomiting and laxative abuse in order to compensate for binges. Individuals with the non-purging type employ methods of weight control, such as fasting or excessive exercise. Of patients who present for treatment in clinics, 80-90% use vomiting as a means of weight control (American Psychiatric Association, 1994).

Evidence suggests that individuals with the purging type have greater concerns about weight and shape and are more likely to experience depression than those with the non-purging type. Regular bingeing and purging may result in harmful physical consequences, for example, frequent purging may produce fluid and electrolyte

imbalances. Vomiting may lead to enlargement of the salivary glands, gastric ruptures and esophageal tears (American Psychiatric Association, 1994).

1.3: Epidemiology of Bulimia Nervosa

Bulimia nervosa occurs mainly in Western cultures, usually affecting young, white women. Of individuals who present clinically with bulimia nervosa at least 90% are women (American Psychiatric Association, 1994). Surveys estimate prevalence rates of 1-3% in Western women (Patton, 1992). Reported incidence estimates for bulimia nervosa range from 9.9-26.5 per 100,000 per year (Szmukler, Dare & Treasure, 1995). However, epidemiological research is limited because it tends to be based on clinical samples, and many individuals with eating disorders do not present at clinics and their eating disorder therefore remains unidentified. As Patton (1992) suggests those who do present clinically may be a selective group, from whom generalisation is difficult. Research on prevalence in community samples is conceptually complicated by the overlap between eating habits in the dieting population and the eating disordered population. Furthermore, bulimia nervosa pursues a fluctuating course and so it is difficult to obtain point estimates which adequately reflect frequency (Szmukler et al, 1995).

Research using clinical samples suggests that bulimia nervosa usually begins in late adolescence or early adulthood and that typically it starts with binge eating. Purging behaviours such as self induced vomiting develop later. Fairburn & P. Cooper (1984) found that the average age of onset of bingeing was 19.7 years \pm 4.2, and of self induced vomiting was 20 years \pm 3.7. The most commonly reported precipitant to binge eating is rigid dieting. Patton (1992) using a non-clinical sample identified that the presence of depression in adolescent dieters is predictive of the development of an eating disorder. More specifically, in patients with bulimia nervosa, Fairburn & P. Cooper (1984) found that 60% reported strict dieting prior to the onset of binge eating.

1.4: Relationship to Anorexia Nervosa

Bulimia nervosa was first identified as a disorder by Russell in 1979 and was conceptualised as a variant of anorexia nervosa. Since that time it has obtained recognition as a disorder distinct from anorexia nervosa and was first included in DSM-III in 1980 (Fairburn, 1987). Many of the features and diagnostic criteria of bulimia nervosa are also characteristic of anorexia nervosa, including concerns with weight and shape, also many patients with anorexia nervosa binge and use purgatives (Fairburn & P. Cooper, 1996). However, individuals with bulimia nervosa tend to fall within the normal weight range; Fairburn & P. Cooper (1984) found that, in a sample of thirty-five women with bulimia nervosa the mean percentage weight of the matched population mean weight was 97.3% +/- 10.3. By contrast individuals with anorexia nervosa are characterised by weight which falls 15% below the expected normal range for age and height (Fairburn & P. Cooper, 1996).

Research suggests that a proportion of individuals with bulimia nervosa have a history of anorexia nervosa. Fairburn & P. Cooper (1984) found that 25.7% of women with bulimia nervosa had previously fulfilled diagnostic criteria for anorexia nervosa. However, Fairburn & P. Cooper (1984) also found that bulimic individuals with a history of anorexia did not differ in psychopathology from bulimics who had no history of anorexia nervosa. They concluded that bulimia nervosa should not be regarded as a chronic complication of anorexia nervosa, but as a disorder with a specific psychopathology.

1.5: Relationship to Depression

Observations that individuals with bulimia nervosa often experience high levels of depression has led to the conceptualisation of bulimia as an affective disorder (Beebe, 1994). Research on prevalence rates of depression in individuals with bulimia nervosa suggests that approximately a third of women with bulimia meet criteria for major

depressive disorder and that as many as three quarters of bulimic patients have depressed mood (Levy, Dixon, & Stern, 1989). A high proportion also report suicidal thoughts and 20% of women with bulimia nervosa attempt suicide (Beebe, 1994).

Further evidence used to support the argument that bulimia nervosa is a form of affective disorder is the high prevalence of depression amongst the families of bulimic probands (P. Cooper & Fairburn, 1986). Antidepressant medication has also been found to decrease binge and eating disorder psychopathology (Levy et al., 1989). Research investigating neuroendocrine function demonstrates similarities between individuals with depression and bulimics (P. Cooper & Fairburn, 1986). However, Levy et al. (1989) in their review of the relationship between depression and bulimia nervosa found much of the above cited evidence to be equivocal. When compared to normal controls the apparently high prevalence rates of depression amongst families of bulimics disappeared. Furthermore, antidepressant medication has also been found effective in the treatment of conditions other than affective disorders, such as panic disorder, enuresis and school phobia.

Clinical observations of individuals suffering from bulimia suggest that they experience affective changes across the binge-purge cycle which are closely related to bulimic behaviours. As Beebe (1994) suggests to conceptualise bulimia nervosa as a variant of depression disregards the inter-relationship between bulimic behaviours and negative affect. Alternatively, the presence of depression and anxiety in individuals with bulimia nervosa may be conceptualised as separate psychiatric disorders which are comorbid with the eating disorder. However, again, this view fails to take account of the inter-relationship between affective and bulimic symptoms (P. Cooper, 1995).

As discussed, bulimia nervosa is characterised by concerns about weight, shape and eating, which are over-valued and dysfunctional. Such concerns are thought to underlie and maintain bulimic behaviours (Fairburn & P. Cooper, 1996). However,

according to the argument that bulimia is a variant of depression, the apparent relationship between dysfunctional cognitions and bulimic behaviours may be an artifact of their respective association with depression (Poulakis & Wertheim, 1993).

Poulakis & Wertheim (1993) investigated the relationship between dysfunctional cognitions, depression and bulimic tendencies in a non-clinical sample of women. Using regression analysis they found that both depression and measures of bulimic psychopathology accounted for bulimic symptomatology. These results are supported by the findings of Schlesier-Carter, Hamilton, O'Neil, Lydiard & Malcolm (1989) who found that bulimic patients differed significantly from non-clinical controls regardless of levels of depression on measures of eating disorder psychopathology. In contrast to this Clark, Feldman & Channon (1989) found that levels of depression emerged as the only predictor of eating disturbance in patients with bulimia nervosa. However, these findings were based on small sample sizes and limited measures of eating disorder pathology.

Research comparing clinical samples of individuals with depression and bulimics suggests there are symptomatic differences between the two groups. P. Cooper & Fairburn (1986) found that bulimic patients demonstrated a greater frequency of obsessional ruminations and anxiety, whereas depressed patients demonstrated more suicidal ideation, sadness and depressed mood. Exploration of the specific content of cognitions in bulimic patients suggested that depressed mood was directly related to concerns about weight, shape and eating. P. Cooper & Fairburn (1986) concluded that depression is therefore secondary to the eating disorder itself.

The role of depression in the maintenance of bulimia nervosa remains to be established (Beebe, 1994), and research in bulimia nervosa needs to take account of the influence of depression on cognition, for example, on information processing biases for weight, shape and eating related information.

1.6: Models of Bulimia Nervosa

Since the inception of bulimia nervosa as a recognised clinical disorder there has been a development of theories ranging from socio-cultural to biological, which seek to explain the aetiology and maintenance of the disorder (Agras & Kirkley, 1986). A brief overview of these theories and models will be presented. However, the main body of this section will focus on cognitive-behavioural models.

1.6.1: Socio-Cultural Theories

Socio-cultural theories emphasise societal ideals for thinness as primary in the aetiology of eating disorders. Bruch in 1973, suggested that fashion and the media provided the means for the dissemination of societal ideals for slimness. These ideals are then held to underlie eating disorders (Szmukler & Patton, 1995); it is argued that it is culturally valued to be thin and that women are under great pressure to conform to these ideals. Evidence cited in support of this includes the increased interest in dieting since the 1960s and the societal change in valued body shape to a more androgynous, sylphlike form (Agras & Kirkley, 1986). Evidence suggests that over the decades eating disorders have indeed become more common. However, as Szmukler & Patton (1995) suggest this increased prevalence may be artificially inflated by demographic changes. In support of socio-cultural theories, research indicates that bulimia nervosa was rare prior to the 1970s and that there has been an increase in both anorexia and bulimia nervosa in younger age groups of women (Szmukler & Patton, 1995).

While it may be accepted that culturally valued ideals for thinness are an important consideration, their precise role in the aetiology and maintenance of eating disorders is not clear. Socio-cultural theories fail to account for differences between anorexia and bulimia nervosa, and differences between normal dieting and eating disorders.

1.6.2: Family Models and Adverse Events

The family may be viewed as a complex social system, which provides a context for the development and maintenance of bulimia nervosa. Empirical research on the role of family factors has focused on the characteristics of families, adverse events particularly within the family, and the family as a social system (Eisler, 1995).

Evidence suggests that adverse events, most notably childhood sexual abuse may be an important factor. Research indicates that approximately a third of patients with bulimia nervosa experience childhood sexual abuse. However, comparable rates of childhood sexual abuse have also been found amongst other psychiatric groups (Eisler, 1995).

Observations of families of eating disordered patients suggest that individuals with bulimia nervosa view their families as conflicted, disorganized, non-cohesive and lacking nurturance and care. Within this context the bulimic individual is seen as angrily submissive to hostile and neglectful parents (Vandereycken, 1995). However, as Eisler (1995) suggests, the notion that there is a particular type of family associated with bulimia nervosa is difficult to sustain. The families of bulimic individuals vary greatly and do not conform to a single pattern. While research using clinical samples has demonstrated a particular family pattern associated with bulimia nervosa, research using community samples has found no differences between control groups and bulimics (Eisler, 1995). In sum, evidence that there is a particular family system associated with bulimia nervosa is inconclusive.

1.6.3: Psychodynamic Models

Johnson (1995) proposes that the common theme of all psychodynamic approaches is the notion that, from infancy, how an individual interacts with their environment shapes the way that person thinks and acts. Over time the individual consolidates a sense of self, which regulates interactions with the environment. Throughout the life

span if the self is not successfully adaptive then the individual will develop symptoms. Symptoms are regarded as windows to the self and mind.

Bulimia nervosa has been formulated developmentally within psychodynamic drive theories. Conflict around issues of control between the bulimic and her mother over feeding and toileting in infancy may be relevant to the development of autonomy in the young adult. The bingeing behaviour of the bulimic may be linked to the development of control in the anal stage, while poor impulse control may represent an aggressive drive or anger towards the self (Dare & Crowther, 1995).

Another prominent psychodynamic model, that of object relations, proposes that the psychology of the individual is dominated by the relationship between self and others. According to this model eating disorders represent disorders of personal relationships and the organisation of the self. The individual with bulimia nervosa has a weak sense of being able to control their own sense of well-being, safety and destiny (Dare & Crowther, 1995). The interpreted message of symptomatic behaviour is the cause of the disorder. Psychoanalytic models do not therefore make predictions about the nature of experiences that will result in bulimia nervosa. This means that psychoanalytic accounts are difficult to evaluate.

1.6.4: Biological Models

Bulimia nervosa has been formulated as a metabolic disturbance. The bingeing behaviour of bulimics, in which large quantities of carbohydrates are usually consumed, is understood as an abnormal craving. This abnormal desire for carbohydrate is attributed to a disturbance in the metabolic feedback mechanism which regulates the consumption of carbohydrate. Animal studies using rats have demonstrated that, when fed a meal high in carbohydrates, there is an increased production in brain serotonin levels which results in a decrease in carbohydrate consumption and an increase in protein intake. Disturbance in this mechanism results in craving for carbohydrates

(Agras & Kirkley, 1986). This model would suggest that the individual with bulimia will experience a constant craving for carbohydrates. This account offers no explanation for the purging behaviour of individuals with bulimia nervosa. However, where carbohydrates have been restricted from the diet, this model may partly account for the consumption of carbohydrates during a binge and the associated sense of loss of control.

Genetic models of bulimia nervosa suggest that there is a genetic vulnerability to the development of the disorder. The clinical features of bulimia nervosa are seen as pathological exaggerations of heritable personality traits and biological propensities. Genetic models therefore seek to draw a link between genes, personality and symptoms. According to this model individuals with bulimia are more likely to be thrill seeking, excitable, lack persistence and have a tendency towards dysphoria in response to rejection. Such traits are seen to increase the likelihood of loss of control and dietary chaos. Evidence from twin studies provides equivocal support for a genetic predisposition to bulimia nervosa (Strober, 1995). Furthermore, it is not clear how these personality traits predispose the individual to psychological problems or specifically to an eating disorder.

1.6.5: Summary

In summary, theories ranging from socio-cultural to biological suggest that the aetiology and maintenance of bulimia nervosa may be multifaceted. While these models make observations about factors which might be important in the understanding of bulimia nervosa, they often fail to offer a formulation for the role of such factors in aetiology and maintenance. Overall, empirical evidence to support these models is limited. The most prominent models of bulimia nervosa are the cognitive-behavioural, which offer a formulation of the maintenance of the disorder and have been widely researched. Cognitive-behavioural formulations of bulimia nervosa will be discussed below.

1.7: Cognitive-Behavioural Models

Clinical observations that cognitive factors are central in bulimia nervosa has led to the development of several theoretical models which emphasise the meaning of weight and body shape to the individual with bulimia nervosa. The most prominent model is that of Fairburn, Z. Cooper & P. Cooper (1986). This model, as well as the contributions and more recent developments of cognitive understandings of bulimia nervosa (Guidano & Liotti, 1983; Vitousek & Hollon, 1990), will be reviewed.

The model of Fairburn et al. (1986) is based on Beck's model of cognition and emotion (Vitousek, 1996). Beck postulated the presence of schemata, which are stable structures representing self knowledge and world knowledge. These schemata develop early in life in order to accommodate experiences. Schemata remain latent in the cognitive system until activated by a congruent event. Once activated, schemata guides cognitive processes, which operate to favour schema congruent information (Blackburn & Davidson, 1990). The processes by which schemata maintain internal consistency over external validity, assimilation over accommodation and stability over change are of particular interest in the study of clinical problems, as these processes may serve to perpetuate negative views of the self (Vitousek & Hollon, 1990).

1.7.1: Fairburn, Z. Cooper and P. Cooper (1986)

According to this model attitudes to weight and shape are central to the maintenance of bulimia nervosa. Fairburn et al. (1986) suggested that these attitudes are overvalued and represent the core pathology of bulimia, rather than being symptomatic of the disorder. This model proposes that bulimics evaluate their self-worth in terms of their shape and weight: thinness is viewed positively and thought to be desirable, and fatness is viewed negatively. These attitudes may be regarded as rules by which the individual organizes their experiences and the goals they set themselves. Attitudes to food and eating are considered to be secondary consequences of attitudes to weight and shape (Fairburn & P. Cooper, 1996).

These attitudes or beliefs are considered dysfunctional because they are rigid, extreme and of great personal significance. It is the rigid, extreme and absolute nature of these beliefs which reflects dysfunctional styles of reasoning, such as dichotomous thinking and catastrophizing. These beliefs manifest in dysfunctional thoughts concerning weight and shape. Such dysfunctional thoughts account for the use of behavioural strategies to control weight, such as the avoidance of fattening foods (Fairburn et al., 1986).

In order to explain the binge eating behaviour observed in bulimia nervosa, Fairburn et al. (1986) suggest that intense concerns with weight and shape lead the individual with bulimia to adopt extreme dietary rules which are impossible to obey. Minor deviations from these rules are viewed as catastrophic, and result in the temporary abandonment of all controls over eating. The likelihood of total abandonment of self control over eating is further increased by the tendency towards dichotomous thinking. The subsequent fears of becoming fat after bingeing, trigger compensatory behaviours, such as self induced vomiting. A vicious cycle is thus established in which purging behaviours reinforce overeating (Fairburn et al., 1986).

This model highlights the importance of automatic thoughts, dysfunctional styles of reasoning or disturbance in information processing, and underlying beliefs and assumptions in the maintenance of bulimia nervosa. It is therefore most appropriately conceptualised as a model of maintenance rather than aetiology (M. Cooper, 1997). A criticism directed at this model is that it does not account for the observation that some eating disordered individuals such as anorexics, who also have concerns about weight and shape, manage to maintain consistent control over eating and do not experience episodes of bingeing. Although not specified in detail, Fairburn et al. (1986) suggest that a family history of obesity and affective disorders, and the contribution of personality traits may be important.

1.7.2: Guidano & Liotti (1983)

The theory of Guidano & Liotti (1983) is primarily concerned with anorexia nervosa. However, this theory may be considered to be of some relevance to bulimia nervosa as Guidano & Liotti assume that all eating disorders share the same underlying cognitive structures. They propose that problematic personal identity cognitive structures associated with a dire need for love, a sense of personal ineffectiveness, and intolerance of disappointment, underlie eating disorders. Symptoms, such as the belief that the self lacks control when faced with food, may be construed as an expression of problems in the personal identity structures associated with general personal ineffectiveness (Guidano & Liotti, 1983).

This model emphasises the role of developmental factors in the formation of cognitive structures, such as a failure to develop autonomy, individuality and self expression. Guidano & Liotti (1983) postulate that individuals with eating disorders have an imprecise attributional style and therefore have difficulty identifying the real nature of the problem. This attributional style in combination with problematic personal identity structures results in maladaptive solutions to problems, such as dieting. According to this theory, in order for effective treatment of eating disorders, change needs to occur at the level of personal identity structures and attributions about reality.

In summary, Guidano & Liotti (1983) provide a developmental perspective and highlight the importance of general schemata not associated with weight, shape and eating concerns. Furthermore, they emphasise the importance of early experience in the formation of schemata.

1.7.3: Vitousek and Hollon (1990)

Vitousek & Hollon (1990) propose the existence of cognitive structures, weight-related self-schemata, which unite views about the self with beliefs about weight.

These are a conjunction of self-schemata and weight-related schemata. Self-schemata may be defined as cognitive generalizations about the self, based on past experience, which organize and guide the processing of self related information (Markus, Hamill & Sentis, 1987). Weight-related schemata are beliefs about what it means generally to be fat or thin. This does not pertain to the status of the self as fat or thin, but refers to the meanings ascribed to these characteristics. Individuals with bulimia have an associative network linking the construct of 'thinness' to constructs such as 'self-control' and 'beauty'. Such weight-related schemata may be typical of non-eating disordered individuals, who may also associate fatness with negative qualities. However, Vitousek & Hollon (1990) propose that individuals with bulimia may be distinguished from non-eating disordered individuals by the processing and operation, rather than the content of weight-related schemata, for example personal relevance and overinclusiveness.

According to Vitousek & Hollon (1990) weight-related self-schemata represent the core psychopathology of bulimia nervosa, in which weight and shape come to be seen as the predominant referents for inferring personal value. These schemata guide information processing, such as selective attention which functions to maintain the schemata. Furthermore, they function to simplify, organise and stabilise experiences of the self and the environment.

1.7.4: Summary

M. Cooper (1997) in her review of cognitive theories of eating disorders suggests that the construct of personal identity structures or self schemata as proposed by Guidano & Liotti (1983) and Vitousek & Hollon (1990) respectively, are an important contribution to cognitive understandings of eating disorders. She suggests that these constructs may be conceptualised as core beliefs. Importantly, Vitousek and Hollon (1990) separate general self schemata and weight-related schemata and propose that both are important in the maintenance of bulimia nervosa, through the operation of

weight-related self-schemata. M. Cooper (1997) notes that Vitousek & Hollon (1990) highlight the interdependence of structure and process. This would seem to be an important consideration in the maintenance of eating disorders.

Similarly, Fairburn et al. (1986) suggest that attitudes to weight, shape and eating represent the core psychopathology of bulimia nervosa. Both Fairburn et al. (1986) and Vitousek & Hollon (1990) emphasise the importance of information processing biases in the maintenance of schemata. Guidano & Liotti (1983) also emphasise the importance of developmental factors in the aetiology of eating disorders and thus offer a more longitudinal formulation of core psychopathology.

1.8: Evaluation of Cognitive-Behavioural Models

Vitousek (1996) argues that cognitive models of bulimia nervosa must be supported by evidence that individuals with bulimia hold distinctive beliefs in the domains of weight, shape and food and are prone to reasoning errors within these domains. Clinical observations suggest that bulimics hold extreme beliefs in accordance with the predictions of cognitive models. However, as Vitousek (1996) suggests these observations only serve to confirm Beck's basic proposition about the relationship between psychopathology and distorted thinking style. There is, therefore, a need to demonstrate the specific nature of cognitive processes in bulimia nervosa.

Empirical research on cognitive models in bulimia nervosa has investigated the content of thoughts and assumptions, the relationship between cognition and behaviour, outcome research, and information processing. A brief review of this research and examples from the empirical literature are presented below.

1.9: Content of Thoughts, Assumptions and Beliefs

M. Cooper (1997) notes that cognitive models predict that self statements or automatic thoughts will reflect concerns with weight and shape, and food and eating.

This prediction may be extended to the content of underlying assumptions. However, it would be predicted that core beliefs would reflect more generic propositions about the self. The content of automatic thoughts and assumptions has been investigated using self report questionnaires, a semi-structured interview and techniques from experimental psychology.

1.9.1: Self Report Questionnaires

Self report measures verify that individuals with bulimia nervosa endorse items pertaining to weight, shape and eating (for reviews, see Vitousek, 1996; Mizes & Christiano, 1995). However, self report questionnaires are often based on general observations of individuals with bulimia nervosa and anorexia nervosa in clinical settings, and are rarely designed to test specific hypotheses about the cognitive model (Vitousek, 1996). A further criticism of self report questionnaires such as the Eating Attitudes Test (Garner & Garfinkel, 1979), is that they fail to distinguish between cognition, affect and behaviour (Mizes & Christiano, 1995). Clark, Feldman & Channon (1989) also note that most self report measures have focused entirely on frequency of negative thoughts, and have not provided measures of emotional intensity, controllability and degree of belief. Two studies using self report measures to investigate the specific psychopathology of eating disorders are those of Phelan (1987), and Clark et al (1989). Both these studies assessed the content of automatic thoughts.

Phelan (1987) devised the Bulimic Thoughts Questionnaire, which is composed of thought statements concerning weight, shape and eating. The questionnaire consists of three subscales: self schema, which provides a measure of information about the self and weight; self efficacy, which refers to self perception of control over eating behaviour; and the salient beliefs subscale, which measures irrational beliefs regarding the consequence of losing control of one's eating. Significant differences were found between individuals with bulimia and non-clinical controls on all subscales.

Furthermore, scores on the salient beliefs subscale successfully differentiated bulimics from obese individuals, suggesting that irrational concerns about eating are characteristic of bulimics and do not reflect a cognitive style related to over eating in general (Mizes & Christiano, 1995).

Clark et al. (1989) using a modified version of the Distressing Thoughts Questionnaire found that individuals with anorexia nervosa and individuals with bulimia nervosa had a higher frequency of negative weight, shape and eating related cognitions than female controls. These cognitions were also more emotionally intense, uncontrollable, guilt inducing and plausible to the eating disordered patients than the control participants. For the anorexic sample, cognitions of body dissatisfaction and food preoccupation were found to be specifically associated with eating disturbance. However, content specificity was not demonstrated in the bulimic sample, for whom depression was found to be associated with eating disturbance. Clark et al. (1989) suggest that failure to find a specific relationship between cognition and affect in bulimic individuals may be due to small sample sizes, limitations of the methodology and potential response biases.

Self report measures (e.g. 'The Eating Disorder Belief Questionnaire', Cooper, Cohen-Tovée, Todd, Wells & Tovée, 1997), which assess assumptions and core beliefs in eating disorders suggest that there is a disturbance in cognition at these levels of the cognitive system. Studies using such self report measures have found that individuals with bulimia may be distinguished from non-eating disordered controls on agreement with assumptions concerned with weight, shape and eating and on agreement with negative beliefs about the self (M. Cooper et al, 1997; M. Cooper, 1997).

These studies suggest that there is a disturbance in cognition at the level of automatic thoughts, assumptions and beliefs. However, a limitation of such self report measures is that they rely on retrospective information, which may be inaccurate and subject to

response bias (Vitousek, 1996). Further criticisms are that self report measures are highly structured and therefore may be restricted in the information they provide. In addition, there is limited information available on the reliability and validity of most of these measures (for a review, see M. Cooper, 1997).

The content of thoughts of eating disordered individuals has also been investigated using a semi-structured interview (M. Cooper, Todd & Wells, in press) and techniques from experimental psychology, such as 'thought sampling' (Zotter & Crowther, 1991) and 'concurrent verbalisation' (M. Cooper & Fairburn, 1992a). These techniques provide information on situation specific, current thoughts and do not rely on retrospective accounts (M. Cooper, 1997).

1.9.2: Semi-Structured Interview Method

M. Cooper et al. (in press) used a semi-structured interview to investigate negative self beliefs in women with anorexia, women with bulimia and non-clinical controls. Beliefs linking behaviour with weight and shape and negative beliefs about the self distinguished eating disordered patients from controls. In bulimic individuals, negative thoughts concerning relationships or work often triggered binges, and bingeing functioned to provide distraction from negative thoughts and emotions. All participants with bulimia revealed negative self beliefs associated with themes of worthlessness, failure and loneliness. Three types of assumptions were distinguished: those linking weight gain or loss with acceptance by others, those linking eating with self acceptance and those linking bingeing to cognitive and emotional control. Most notably the bulimics identified permissive thoughts which, once bingeing had begun, enabled the binge to continue. Dieting was seen as a way of counteracting the negative implications associated with self beliefs.

M. Cooper et al. (in press) suggest that the conjunction of general negative self beliefs and assumptions concerning weight, shape and eating is indicative of a specific

cognitive-behavioural profile, which is characteristic of eating disorders. According to M. Cooper et al. (in press) the eating behaviours of bulimics may represent types of schema compensation and cognitive and emotional avoidance. However, this research was based on small sample sizes and is therefore of limited generalisability.

Furthermore, in order to determine whether these findings are particular to eating disordered patients it may be necessary to include other control groups such as dieters and individuals with depression.

1.9.3: Experimental Psychology

Zotter & Crowther (1991) investigated the characteristics of thoughts of bulimics, dieters, and controls using an in vivo thought sampling procedure. Participants self monitored their thoughts every thirty minutes for two randomly selected days. The bulimics reported a greater proportion of eating and weight related thoughts than controls but there was no difference between the bulimic individuals and dieters. However, examination of specific content of thoughts indicated that individuals with bulimia reported a greater proportion of weight related cognitions than both dieters and controls, whereas dieters and controls had relatively more eating related thoughts. This finding highlights the importance of separating weight related content from eating related content in cognitive research. Furthermore, the thoughts of the bulimic individuals in general and in relation to eating and weight were significantly more likely to be characterised by negative affective tone than the thoughts of the dieters and controls.

M. Cooper & Fairburn (1992a) compared individuals with bulimia, individuals with anorexia, non-symptomatic dieters, symptomatic dieters and non-dieting controls. Information was collected on self statements while participants performed three behavioural tasks: looking at themselves in a full length mirror, weighing themselves, and eating a sweet. Overall, the concurrent verbalisation results showed that the eating disorder samples had more negative self statements about eating, weight and

shape during the behavioural tasks than the controls, and dieters were intermediate. The individuals with bulimia showed greater concern with weight and appearance than the dieters, while concern with eating distinguished the anorexics from the dieters. This indicated differences in primary concerns between patient groups.

Techniques such as thought sampling and concurrent verbalisation provide information about the moment to moment cognitions of individuals with bulimia, in naturalistic settings. However, these paradigms may be open to response bias. Furthermore, the studies discussed have not controlled for the role of depression on the emotional tone of thoughts of eating disordered patients and may, therefore, need to include a depressed control group.

1.10: Experimental Evidence of the Relationship between Cognition and Behaviour

The evidence discussed so far suggests that individuals with bulimia nervosa have concerns with weight and shape and, to a lesser extent, with eating and food. These concerns tend to be extreme, rigid and of great personal significance. However, according to the cognitive-behavioural model, cognitions have a causal role in the maintenance of bulimia nervosa. M. Cooper, Clark & Fairburn (1993) argue that studies based on self report measures and techniques such as thought sampling do not provide a direct test of the hypothesis that cognitive disturbance is causally related to disturbed eating behaviour.

M. Cooper et al. (1993) carried out a study to test the causal relationship between thoughts and eating behaviour. They activated assumptions about weight, shape and eating in individuals with bulimia nervosa. The experimental group, who read target word pairs (e.g. fat-disgusting), demonstrated an increase in negative self statements and ate less in a subsequent taste test compared to controls, who read neutral word pairs. This, suggests that assumptions about weight, shape and eating are related to

dieting behaviour. It was further predicted that the experimental group would report more objective binges during the 24 hours following the experiment. However, the predicted relationship between reduced food intake and bingeing was not supported.

M. Cooper et al. (1993) suggest that the demonstrated reduction in food intake may not have been sufficient to trigger a binge, or that the time course of the experiment may not have been sufficient to detect an increase in binge frequency. Furthermore, research indicates that binge eating in bulimia may be triggered by negative emotional states and general negative thoughts (M. Cooper et al., in press), which were not controlled for in this study.

1.11: Outcome Research

Cognitive models predict that successful intervention requires modification of weight-related self-schemata and dysfunctional attitudes towards weight, shape and eating (M. Cooper, 1997). Vitousek (1996) highlights that overall, comparative outcome research on interventions for bulimia indicate that, cognitive-behavioural therapy has proven equal or superior to every modality to which it has been compared. Cognitive-behavioural therapy has produced clinically significant change, with marked reductions in bingeing and purging (Vitousek, 1996).

Support for the cognitive-behavioural model from treatment outcome studies is equivocal, as demonstrated by the findings of Fairburn, Peveler, Jones, Hope & Doll (1993), who compared cognitive-behavioural therapy, behavioural therapy and interpersonal psychotherapy. All three treatments were equally effective in reducing binge episodes and alleviating symptoms of distress, despite the fact that interpersonal psychotherapy as implemented, did not include any direct focus on attitudes to weight and shape, and did not attempt to change eating behaviour. At one year follow-up interpersonal psychotherapy was also as effective as cognitive-behavioural therapy. Fairburn et al. (1993) suggest that the mechanism for this change may have been

improvements in self-worth and competence. However, in support of the cognitive model pretreatment attitudes to weight and shape and self esteem were significantly associated with outcome. Furthermore, at the end of treatment the degree of attitudinal disturbance was associated with likelihood of relapse.

Comparative outcome research demonstrating the success of cognitive therapy provides some support for cognitive models, and demonstrates the importance of cognitive disturbance in the maintenance of bulimia nervosa (M. Cooper et al, 1993). However, different treatment studies have focused on different aspects of cognitive disturbance and it is, therefore, difficult to draw conclusions regarding the efficacy of cognitive-behavioural therapy. M. Cooper (1997) highlights that it is not yet clear which cognitive aspects of the disorder are most significant and which need to be changed for effective outcome. Furthermore, at the end of treatment many patients with bulimia are not symptom free (M. Cooper, 1997).

1.12: Information Processing Paradigms

Empirical research using paradigms such as thought sampling and self report measures provides support for cognitive models of bulimia nervosa. However, findings based on these methodologies are limited by the lack of availability of information on the reliability and validity of measures. Furthermore, self report measures, and techniques such as thought sampling, may be vulnerable to response bias (Vitousek, 1996).

Vitousek (1996) suggests that information processing paradigms offer distinct advantages because they are not subject to bias and are not reliant on self report. Furthermore, they provide information on the cognitive processes, which may maintain eating disorders. The most extensively researched aspect of information processing is attentional bias, primarily utilising the Stroop paradigm. To date, there is one study on interpretation biases using eating disordered patients and minimal research on memory biases (for a review, see Vitousek, 1996; Williamson, 1996; M. Cooper, 1997).

1.12.1: Attentional Biases -The Stroop Paradigm

A central premise of research on cognitive processing is that the primary psychopathological concern of an individual biases the processing of information related to that concern (Williamson, 1996).

Selective attention in eating disorders has mostly been assessed using modified versions of the Stroop (1935) colour naming paradigm (M. Cooper, 1997). The central premise of this paradigm is that individuals with eating disorders will differentially attend to target words associated with their primary concerns, and therefore demonstrate slowed colour naming of these words compared to neutral words (Williamson, 1996). This has been supported by research.

Fairburn, P. Cooper, M. Cooper, McKenna & Anastasiades (1991) compared patients with bulimia nervosa to female controls. Individuals with bulimia demonstrated significantly slower colour naming of weight, shape and eating related words than controls. However, this study did not counterbalance the presentation of words types and so may have had a practice effect. Furthermore, the target words represented a distinct category and the control words did not, which may have influenced the findings.

M. Cooper, Anastasiades & Fairburn (1992) also found that individuals with bulimia nervosa demonstrated an attentional bias towards eating, weight and shape related words compared to female controls. In this study word types were counterbalanced, therefore representing an improvement on the study of Fairburn et al. (1991).

However, the attentional bias demonstrated by M. Cooper et al. (1992) was found to be associated with depression, not bulimic symptomology. This, raises questions about the validity of the Stroop paradigm in eating disorders. However, this was investigated by M. Cooper & Fairburn (1993), in a further study. It was found that frequency of

purging, not levels of general psychopathology was the best predictor of the Stroop interference effect in individuals with bulimia nervosa. Research thus suggests that levels of depression may partially account for the Stroop effect in women with bulimia. However, features specific to bulimia nervosa appear to be most closely associated with attentional biases in the stroop paradigm (Formea & Burns, 1996).

Research using dieters and restrained eaters indicates that attentional biases are not specific to eating disordered patients. Perpiñá, Hemsley, Treasure & de Silva (1993) found that restrained eaters and individuals with a high drive for thinness demonstrated attentional biases towards shape and eating related words. However, of their control participants, only nine were restrained eaters and three had a high drive for thinness. Huon & Brown (1996) found that dieters demonstrate attentional biases towards food words, but not body words and suggested that the Stroop interference effect is specific to dieters and individuals high in body dissatisfaction. However, dieters and restrained eaters may represent heterogeneous groups, including individuals who may be symptomatic. M. Cooper & Fairburn (1992b) found attentional biases only in eating disordered patients and in dieters who had some symptoms, but not a diagnosis of an eating disorder. Normal dieters were comparable to the non-dieting controls.

Studies which have separated food and eating concerns from weight and shape concerns suggest possible differences between individuals with bulimia nervosa and individuals with anorexia nervosa, for example Perpiñá et al (1993) found that bulimics were slower to colour name words related to shape. However, Cooper & Todd (1997) found no difference between anorexics and bulimics in the processing of weight and shape related, or food and eating related words.

The Stroop paradigm provides an objective measure of selective attention, and several studies have demonstrated attentional biases towards weight, shape and eating related words in individuals with bulimia nervosa. Inconsistencies in findings may be due to

technical variations in materials, procedures and analyses. Furthermore, no studies have controlled for the possible confounding effects of hunger on information processing (Vitousek, 1996). Of conceptual importance, is the issue of, what does the Stroop interference effect measure? The most favoured explanation is that it is a measure of attentional bias towards threatening information. However, research also suggests that it may be a measure of cognitive-avoidance (de Ruiter & Brosschot, 1994). Although most work on attentional biases has been conducted using the Stroop paradigm, research using a dichotic listening paradigm also lends support to the evidence that individuals with bulimia nervosa demonstrate attentional biases towards information associated with their primary concerns (Schottc, McNally & Turner, 1990).

1.12.2: Interpretation Biases

M. Cooper (1997) investigated interpretation bias using a questionnaire designed to assess interpretation of ambiguous scenarios with either positive or negative outcomes. A mixed patient group of bulimics and anorexics was compared to non-clinical controls. It was found that when events had a negative outcome the patients selected the weight and shape interpretation and this bias was specific to judgements involving the self. When events were positive the bias was found only in judgements involving others. Overall, patients predicted that weight and shape explanations were more likely and they also estimated that negative outcomes involving the self would be more costly. This remains to be demonstrated in both individuals with bulimia and individuals with anorexia. However, this paradigm is dependent on self report and may therefore be subject to response bias. It may not provide a reliable or valid measure of interpretation bias, because participants are rating what they think would be their most likely interpretation, it is not therefore, a measure of actual interpretation.

1.12.3: Memory Biases

An important schema driven process is that of enhanced recall for weight, shape and eating related information. Memory bias for schema related information in eating disordered patients has been investigated by King, Polivy & Herman (1991). King et al. (1991) compared restrained and unrestrained women, and obese and eating disordered women, on recall for weight, food and appearance related information. Participants were required to read an essay about another person and later asked to recall the essay. The restrained group recalled significantly more weight and food items than unrestrained participants. The obese and eating disordered participants recalled more weight and food related than appearance related information.

King et al. (1991) concluded that the recall biases indicate that a focus on food and weight is a basic organizing principle of person perception for restrained individuals and eating disordered patients. However, this study included only six eating disordered participants, who were mainly anorexic. Cognitive models propose that weight related self schemata are the core psychopathology of eating disorders. It may be argued that because the recall task used by King et al. (1991) was not self referent, it did not access the salient schemata. Furthermore, this study did not control for hunger.

More recently, Sebastian, Williamson & Blouin (1996) compared a mixed group of eating disordered patients, high body dysphoric and normal controls, on recall for fat related body words, neutral body words and neutral control words. Participants were given a self referent encoding task. The eating disordered participants demonstrated a recall bias towards fat related body words. The high body dysphoric and normal controls did not demonstrate differences in recall between the three word types. M. Cooper (1997) notes that all the fat body words were negatively toned, thus it is not clear if the observed recall bias reflects a general negative bias due to depression. This, highlights the need to include a depressed control group and/or negatively toned

emotional words. It is notable that the eating disordered group and high body dysphoric group had moderate levels of depression. Furthermore, this study did not examine the relative contribution of positive or thin body words to selective recall.

Using non-clinical samples, Baker, Williamson & Sylve (1995) investigated recall bias for fat words, thin words, depressed content words and neutral words, in participants high and low in body dysphoria. The high body-dysphoric group demonstrated a recall bias towards fat words and the low dysphoric group showed a significant recall bias towards thin words. In this study half of the participants were administered a negative mood induction procedure, which increased recall bias for depressed words, but not fat words in all participants, and produced an increased body size overestimation in high body dysphoric participants. They concluded that individuals with high body dysphoria have negative body schemata which allow greater elaboration of fatness words and, therefore, recall. It was further concluded that depressed mood via the mood induction procedure, triggered more general negative schemata. This finding remains to be replicated using eating disordered samples.

1.13: The Paradigm: Explicit Memory Bias

The two main frameworks within which information processing paradigms have been used, are the network theory of Bower (1981) and the schema theory of Beck (1976), (cited in Williams, Watts, Macleod, & Mathews, 1988). In the semantic associative network model (Bower, 1981), concepts, emotions and experiences are represented by distinct nodes interconnected within a network. When a node is activated by an external stimulus, activation spreads automatically to other nodes. The relationship between affect and cognition is therefore predicted by the interconnection of nodes. Beck (1976) postulates the presence of schemata, which are organized representations of self knowledge and world knowledge. When activated, schemata guide the processing of information (Teasdale, 1995).

Both models make predictions that cognitive processing in general, is biased in emotional disorders (Power & Dagleish, 1997). However, research on information processing in depression and anxiety demonstrates differential processing biases. Investigation of memory bias and depression has consistently found evidence of a mood-congruent bias to recall negative, especially self-referenced information; but has failed to demonstrate attentional biases in depression. By contrast, there is a large body of evidence to support the presence of attentional biases towards threatening information in anxiety, but not recall biases (Mineka & Sutton, 1992).

These empirical findings have led Williams et al. (1988) to propose a model in which particular cognitive biases are specific to particular emotional disorders. They draw distinctions between the processes of integration and elaboration. Integration is an automatic process and serves to strengthen the internal cohesiveness of mental representations, it is associated with attention. Elaboration may be defined as the formation and strengthening of associative links between representations in memory. This process serves to make representations more retrievable, and better elaborated information is more readily recalled (Williams et al., 1988). According to this model there can be dissociation between the two processes, such that integration processes are biased towards the detection of anxiety relevant stimuli, but elaboration is biased away from the processing of threat. In depression the main cognitive processes are elaborative ones (Power & Dagleish, 1997).

Research on attentional biases in eating disorders suggests that individuals with bulimia nervosa demonstrate an automatic bias to selectively process weight, shape and eating related stimuli. The limited research on explicit memory in eating disordered patients (Sebastian et al., 1996) suggests that representations of emotional body related information may also be more retrievable in individuals with eating disorders.

1.14: Current Status of Memory Biases in Bulimia Nervosa

To date, research on memory biases demonstrates that individuals with eating disorders demonstrate enhanced recall for weight, shape and eating related information (King et al, 1991; Sebastian et al., 1996). Only one study (Sebastian et al, 1996) has included sufficient numbers of eating disordered participants. Using a control group of high body dysphoric women, this study demonstrated that memory biases for fatness related body words are specific to eating disorders. However, the eating disordered sample in this study was composed of a mixed group of individuals with anorexia nervosa, bulimia nervosa and unspecified eating disorders. Memory biases specific to individuals with bulimia nervosa remain to be established.

As discussed, depressive symptoms are common in eating disordered patients and the study of Sebastian et al. (1996) did not control for depression. The memory bias for fat-related body words found by Sebastian et al. (1996) may be explained in terms of a general negative bias, due to depression. This, highlights the need for a depressed control group and the inclusion of negatively toned emotional stimuli in the memory task. Furthermore, memory biases for thin body words in eating disordered participants also remains to be evaluated.

King et al. (1991) found that eating disordered patients demonstrate memory biases for food related words. However, as discussed this finding was based on only six participants, who were mostly anorexic. Research indicates that individuals with bulimia nervosa demonstrate attentional biases towards food related information (M. Cooper & Fairburn, 1992b; M. Cooper & Todd, 1997). However, all research on attentional biases towards food related words has not controlled for hunger, which may lead to a state dependent processing bias. It remains to be established that individuals with bulimia demonstrate enhanced recall for food related words and whether this is specific to fat related food words. Furthermore, M. Cooper & Todd (1997) found that bulimics demonstrate attentional biases towards all three areas of

concern with weight, shape and eating. Memory biases for the separate areas of concern in bulimia nervosa remain to be established.

1.15: Research Questions

The first aim of this study was to investigate whether women with bulimia nervosa demonstrate a general memory bias towards weight and shape, and food related words separately. A second aim was to investigate, whether they demonstrate memory biases specific to weight, shape and food related words or whether they demonstrate a bias to emotional words in general. Furthermore, whether women with bulimia demonstrate memory biases specific to negative weight, shape and food related words, or whether they demonstrate a bias to negatively valenced words in general, as with individuals with depression. A further aim was to replicate the findings of Sebastian et al. (1996) that memory biases in women with bulimia are specific to weight and shape words and not to body words in general.

1.15.1: Hypotheses

1a) Women with bulimia nervosa will recall a greater number of weight and shape related words than neutral nouns compared to female controls and compared to depressed controls.

1b) Women with bulimia nervosa will recall a greater number of weight and shape related words than neutral body words, compared to female and depressed controls.

2) Women with bulimia nervosa will recall a greater number of food words than neutral nouns compared to depressed and female controls. Recall bias for food words will not be associated with hunger.

3a) Women with bulimia nervosa will recall a greater number of weight/shape words than emotion words compared to depressed and female controls.

3b) Women with bulimia nervosa will recall a greater number of food words than emotion words compared to depressed and female controls.

4a) Women with bulimia nervosa will recall a greater number of negative weight and shape words than negative emotional words compared to female and depressed controls.

4b) Women with bulimia nervosa will recall a greater number of negative food words than negative emotional words compared to female and depressed controls.

Section 2: Method

2.1: Participants

2.1.1: Clinical Participants

Twelve participants with bulimia nervosa and twelve with depression were recruited through their responsible clinician. All were female, aged 18-35, and had a Body Mass Index, [weight (kgs)/height (m²)] within the range of 19-25 (National Research council, 1989). All fulfilled DSM-IV criteria (American Psychiatric Association, 1994) for bulimia nervosa or for major depression at the time they took part in the study. Women with depression who also had eating disorder symptoms, or a history of an eating disorder were excluded from the study. Furthermore, as far as possible, women with depression who were following a diet, were also excluded.

2.1.2: Non-clinical Participants

Eighteen non-clinical controls were recruited by requesting volunteers from amongst hospital employees. All were female (aged 18-35) and had a Body Mass Index within the range of 19-25. Women with a diagnosis or history of an eating disorder or who had a psychiatric history were excluded by interview. Women who had been dieting for a period of four weeks or more, were also excluded by interview. Dieting was defined as following a standard reducing diet and/or setting rigid rules about what should be eaten (M. Cooper & Fairburn, 1992a).

All individuals approached and asked to participate in this research were given a copy of the information sheet, and a reply slip to say whether they were willing to take part (see Appendix 1). G.P. consent was obtained for participants who agreed to take part (see Appendix 2).

2.2: Design

This was a between group factorial design. The experiment had one unrelated factor: group, and one within subject factor: word type. The dependent variable was number of words recalled.

2.3: Measures

2.3.1: Demographic Information

Information was obtained on demographic and background features, including age, weight and height, number of years in full time education and qualifications.

2.3.2: Self Report Questionnaires (see Appendix 3)

Participants completed the following self report questionnaires:

-Eating Attitudes Test (EAT; Garner and Garfinkel, 1979). The EAT achieved high concurrent validity using anorexic patients, in which it was significantly correlated with criterion group membership ($r=0.87$, $p<0.001$) and achieved high internal reliability (alpha coefficient 0.79).

-Beck Depression Inventory. (BDI; Beck, Ward, Mendelson, Mock & Erbaugh, 1961). Research on the validity and reliability of the BDI indicates that the BDI has good psychometric properties, including high internal consistency (alpha coefficient of 0.86) and high concurrent validity (0.73) (Beck, Steer & Garbin, 1988). Using factor analysis, Pulos (1996) found that the BDI is a valid measure of depression in eating disorders, and does not reflect overlap of eating disorder symptomology.

-Eating Disorders Belief Questionnaire. (EDBQ; Cooper, Cohen-Tovée, Todd, Wells, & Tovée, 1997). This questionnaire consists of four factors, which measure negative self beliefs, weight/shape as a means of acceptance by others, weight/shape as a means of self acceptance and control over eating. Preliminary work indicates that the measure has good psychometric properties, including high internal consistency for each factor (alpha coefficient 0.86-0.93), good concurrent validity using eating disordered patients ($p<0.01$) and is correlated with other measures (EAT $p<0.01$) of eating disorder psychopathology.

-Rosenberg Self Esteem Scale. (RSE; Rosenberg, 1965). Silverstone (1990) found that low self esteem is characteristic of eating disordered patients and that low self esteem is specific to eating disorder psychopathology not levels of depression.

-Mill Hill Vocabulary Scale. (Mill Hill; Raven, 1965) Participants were administered the synonyms section (Form B). From this it is possible to obtain an estimate of IQ (Peck, 1970). However, for the purposes of this study the raw scores were used (Mathews, Mogg, May & Eysenck, 1989).

-Hunger Rating Scales. (Channon, Hemsley, & de Silva, 1988). Although used in previous research these scales do not have established reliability and validity.

2.4: Materials

2.4.1: Stimulus Words:-

A pool of 120 stimulus words was generated. This consisted of 24 neutral body, 24 weight/shape, 24 food, 24 emotional and 24 neutral filler words (see Appendix 4). The body, weight/shape and food words were mostly drawn from previous published research (Sebastian, Williamson, & Blouin, 1996; Huon & Brown, 1995; Markus, Hamill & Sentis, 1987; Channon, Hemsley & de Silva, 1988). The emotional words were generated through examination of self report inventories for emotional disorders particularly depression and were randomly generated. The neutral filler words were randomly selected nouns and did not form a specific category.

Of the food, weight/shape and emotional stimulus words, half were negatively valenced and half were positively valenced in emotional tone (12 negative and 12 positive in each category). All 120 words were categorised for word type and rated for emotional tone, by 14 female post-graduates. Raters were required to categorise the words to ensure that the word categories were, as far as possible, mutually

exclusive. For example the word 'fat' was discarded as this could be categorised as a food, weight/shape or body word. In order to rate emotional tone, raters used a 7-point likert scale (where 0 was negative, 3 was neutral and 6 was positive). In order to rate the food words as positive or negative it was not appropriate to use this scale as it was thought that raters would rate the words according to personal preference. The food words were therefore rated according to whether they were 'thin related' or 'fat related' using a 7-point likert scale (where 0 was thin, 3 neutral and 6 was fat). The percentage of raters who assigned each word to each category and rated each word as negative, positive or neutral was calculated. It was intended to use a criterion of 80% agreement of raters (Baker, Williamson & Sylve, 1995).

Many words achieved 100% agreement for categorization and valence. However, it was necessary to accept and include some words which according to ratings were ambiguous to some degree in categorization and valence. Some words did not meet the criterion of 80% agreement of ratings, but were included in order to match word categories for frequency (see Appendix 5). As far as possible homonyms were excluded from the word stimuli.

Research using information processing paradigms suggests that word frequency may significantly affect results. Gardner, Rothkopf, Lapan & Laferty (1987) found that subjects making lexical decisions were reliably faster when responding to high frequency words. The stimulus words used here were therefore matched for frequency across the word categories. In addition within the word categories, negatively valenced and positively valenced words were also matched for frequency. Word frequencies were obtained from the norms of Carroll, Davies & Richman (1971). In order to match word categories for frequency it was necessary to replace one negative and one positive weight/shape word. As the frequencies were not normally distributed, a non-parametric Kruskal-Wallis test was carried out in order to determine whether the

word categories differed significantly in terms of frequency. No significant differences were found at the 5% level.

It was thought that words of more than one syllable may be more easily heard and recognised than single syllable words on an auditory task. A further analysis of number of syllables was carried out using a Kruskal-Wallis test. A significant difference was found overall between the word categories at the 5% level. However, in the analysis of the recall data not all word categories were compared to each other. Further analyses were therefore carried out on pairs of word categories, which would be compared in the analysis of the recall data. Wilcoxon rank sum analyses for unrelated data were carried out on target word categories, no significant difference at the 5% level was found (see Appendix 6).

2.5: Ethical Approval

Prior to commencing the research, ethical approval was sought from Oxfordshire Psychiatric Research Ethics Committee, Northampton Medical/Research Ethics Committee, and Aylesbury Vale Local Research Ethics Committee. Ethical approval was granted by all three committees. (see Appendix 7).

2.6: Procedure

2.6.1: Settings

Participants were seen individually either at the participant's home or in a clinic, depending on the preference of the participant.

2.6.2: Consent

Initially, participants were given the opportunity to ask any questions about the study and required to complete a consent form (see Appendix 8).

2.6.3: Participant Screening

Participants were screened for depression or bulimia nervosa with the Structured Clinical Interview for DSM-IV (Spitzer, Williams & Gibbons, 1996) in order to ensure patient participants met DSM-IV criteria for either disorder. The non-clinical controls were asked about any history of, or current psychiatric treatment (see Appendix 9).

Information on age, weight and height, number of years in full time education and qualifications was gathered.

2.6.4: Memory Task

Prior to starting the cognitive task participants were asked to complete the Hunger Rating Scales.

Participants were then presented with a practice trial of six words to ensure they understood the instructions. Participants were instructed to listen to the words and to imagine a scene involving the word and themselves. Encoding was therefore self referent. Then the 120 experimental words were presented in a fixed random order on audiotape at the rate of one word every 10 seconds. Following completion of the word task participants were given a distraction task, in which they were required to count backwards in threes from 100 for 20 seconds. Participants were then given a blank sheet of paper and asked to write down all the words they could remember hearing on the tape, indicating when they had finished.

On completion of the experimental task participants were given the questionnaire measures.

2.6.5: Debriefing

At the end of the test session participants were debriefed. The rationale of the study was explained and they were given further opportunity to ask any remaining questions.

Section 3: Results

3.1: Overview of Results Section

In the first instance demographic data and questionnaire data were analysed to establish whether the three groups were representative of the populations from which they were sampled. The data for each of the hypotheses was then investigated.

3.1.1: Demographic Data

The mean age, Body Mass Index (BMI) and number of years in full-time secondary-higher education for the three groups is presented in Table 1 below.

Table 1: Demographic data for the three groups

Group	Mean age in years (SD)	BMI-kg/m ² (SD)	Mean years in education (SD)	% higher qualifications
Bulimia nervosa (N=12)	23.75 (4.16)	22.33 (2.31)	8.92 (2.64)	25%
Depressed controls (N=12)	27.58 (4.85)	23.17 (2.37)	8.17 (2.82)	33%
Female controls (n=18)	26.56 (3.26)	22.39 (1.61)	11.89 (1.08)	100%

SD= standard deviation; Mean years in education= the mean number of years in full-time education from the age of 11 years upwards; % higher qualifications= percentage of participants with degrees or above.

A Kolmogorov-Smirnoff Test indicated that the demographic data were not normally distributed and therefore did not meet assumptions necessary for parametric statistics. Kruskal-Wallis analyses of variance were used to evaluate group differences. There was no significant difference between groups in BMI. However, the groups did differ significantly in age ($X^2(2) = 6.92, p < .04$), and number of years in education ($X^2(2) = 13.32, p < .001$).

3.1.2: Self Report Questionnaires

The data from the self report questionnaires is presented in Table 2 below (see Appendix 10).

Table 2: Mean scores and standard deviations for each self report questionnaire.

SCALE	Bulimia Nervosa (N=12)	Depressed Controls (N=12)	Female Controls (N=18)
BDI	25.5 (8.64)	25.33 (11.19)	5.41 (3.82)
EAT	30.08 (10.54)	5.92 (4.52)	2.44 (2.01)
RSE	20.08 (3.26)	18.58 (5.26)	31.28 (5.02)
Mill Hill	27.00 (4.88)	28.25 (5.05)	30.72 (3.68)
EDBQ- A	65.67 (21.45)	26.55 (18.77)	7.69 (9.41)
EDBQ-C	71.58 (19.77)	23.00 (20.08)	2.55 (4.27)
EDBQ-NS	67.33 (18.61)	59.66 (26.12)	12.68 (14.65)
EDBQ-SA	92.7 (10.91)	53.62 (22.57)	43.29 (22.46)

Standard Deviation in parentheses, BDI= Beck Depression Inventory; EAT= Eating Attitudes Test; RSE=Rosenberg Self Esteem Scale, this has been scored in a positive direction such that a higher score indicates higher self esteem; Mill Hill= Mill Hill Vocabulary Scale, Synonym Section; EDBQ-A= Eating Disorders Belief Questionnaire-Acceptance by others Scale; EDBQ-C= Control Scale; EDBQ-NS= Negative Self Beliefs Scale; EDBQ-SA= Self Acceptance Scale.

A Kolmogorov-Smirnoff Test indicated that the data for each of the self report questionnaires, for each group, were normally distributed. One way analyses of variance with Post hoc Tukey tests, were therefore used to assess group differences.

Beck Depression Inventory (BDI)- As expected a significant difference was found between groups in levels of depression ($F(2,39) = 32.76, p < .0001$). The female control group had significantly lower levels of depression than both the depressed and bulimic groups, (both comparisons, $p < .05$). There was no significant difference in levels of depression between the bulimic group and depressed group.

Eating Attitudes Test (EAT)- A significant difference was found between groups on the EAT ($F(2,39) = 77.16, p < .0001$). The bulimic group scored significantly higher than the female controls and depressed controls (both comparisons, $p < .05$), indicating that the bulimic group had more disturbed eating attitudes. No difference was found between the depressed group and female controls.

Rosenberg Self Esteem Scale (RSE)- A significant difference was found in self esteem between the three groups ($F(2,39) = 33.98, p < .0001$). The female control group scored significantly higher on the RSE than both the depressed and bulimic groups (both comparisons, $p < .05$), indicating that the female controls had higher self-esteem. No difference was found between the depressed control group and bulimic group.

Mill Hill Vocabulary Scale- Raw scores (total number of correct responses, plus 10 points) were used to investigate the difference between the groups, which was not significant, indicating that levels of verbal ability between the groups is approximately equivalent. However, the difference was approaching significance ($F(2,39) = 2.73, sig. = .08$). A Pearson correlation was conducted to explore the relationship between verbal ability and recall. A significant positive correlation was found between scores on the Mill Hill and total number of words recalled across the three groups ($r = .403, p < .008$). However, scores on the Mill Hill were not found to be correlated with selective recall of word types, except for emotion words ($r = .412, p < .01$), and body words ($r = .418, p < .01$). It was therefore decided not to use the Mill Hill as a covariate, as the assumptions for homogeneity of regression would not be met. Furthermore, the correlation analyses seem to indicate that verbal ability affects overall recall, but not selective recall of word types (see Appendix 11).

Eating Disorders Belief Questionnaire (EDBQ)- The scales of the EDBQ were analysed using one way analysis of variance. The results of these analyses showed a significant difference between groups on each scale. The results are presented in Table 3, below.

Table 3: Results of Analysis of EDBQ Scales

Scale	DF	F value	Significance
EDBQ-A	2,39	45.46	$p < .0001$
EDBQ-C	2,39	74.88	$p < .0001$
EDBQ-NS	2,39	35.09	$p < .0001$
EDBQ-SA	2,39	23.09	$p < .0001$

EDBQ-A= Eating Disorders Belief Questionnaire-Acceptance by others Scale; EDBQ-C= Control Scale; EDBQ-NS= Negative Self Beliefs Scale; EDBQ-SA=Self Acceptance Scale.

Post hoc Tukey tests indicated that the bulimic group scored significantly higher on every scale than both the depressed and female control groups (all comparisons, $p < .05$), except for the EDBQ-NS, on which they did not differ from the depressed group. The EDBQ-NS measures global negative self beliefs, it may therefore be expected that no difference would be found between the depressed and bulimic groups on this scale. It is notable that significant differences were found on all the scales between the depressed and female control groups (all comparisons, $p < .05$), except for the EDBQ-SA. The EDBQ-SA measures beliefs about weight and shape as a means of self-acceptance.

Summary

Although there were some demographic differences between the groups, overall, the demographic data and the results from the questionnaire measures suggest that the female controls, the depressed group, and the bulimic group are representative of the populations from which they were sampled. They are therefore appropriate comparison groups.

3.2: Analysis of Selective Recall Measures

The number of correctly recalled words for each word category was calculated. Singular and plural versions of a word were accepted, however, any other differences

were scored as incorrect. A Kolmogorov-Smirnoff Test indicated that the recall data for each word type, in each group, were normally distributed. The data therefore met assumptions necessary for parametric statistics. Analysis of variance with Post hoc Tukey tests, were therefore used to assess group differences.

3.2.1: Hypothesis 1a) Women with bulimia nervosa will recall a greater number of weight and shape related words than neutral words compared to female controls and compared to depressed controls.

This hypothesis was tested by analysing the mean recall of all weight/shape words compared to neutral nouns by the three groups. The means and standard deviations are presented in Table 4 below.

Table 4: Mean and Standard Deviation of words recalled in each category

Word Type	Bulimics N=12	Depressed N=12	Controls N=18
Neutral Nouns	3.5 (2.35)	2.92 (2.75)	6.44 (2.89)
Weight/shape	6.67 (2.35)	3.67 (2.64)	8.06 (2.92)

standard deviation in parentheses

Two Way Analysis of Variance of Group by Word Type (nouns vs weight/shape).

A two way analysis of variance [group x word type (nouns vs weight/shape)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 14.64, p < .0001$), indicating that more words related to weight and shape than neutral nouns were recalled. There was also a main effect of group ($F(2,39) = 11.71, p < .0001$). No significant two way group by word type interaction was found ($F(2,39) = 1.93, NS$). Post hoc Tukey tests of the main effect of group showed that the control group recalled more weight/shape words and nouns than the depressed group and bulimic group (both comparisons, $p < .05$).

3.2.2: Hypothesis 1b) Women with bulimia nervosa will recall a greater number of weight and shape related words than neutral body words compared to female and depressed controls.

The neutral nouns did not form a distinct category, whereas the weight/shape words did, which may account for the finding that there was no two way interaction of group by word type. A further analysis was conducted on recall of weight/shape words compared with the category of body words. Furthermore, the aim of this analysis was to investigate whether women with bulimia demonstrate enhanced recall specifically for weight and shape related words or for body related words in general. Sebastian et al. (1996) found that women with eating disorders demonstrated selective recall specifically for weight and shape related words rather than general body words. It was intended in this study to see if this finding could be replicated in women with bulimia nervosa. The means and standard deviations are presented below in Table 5.

Two way analysis of variance of group by word type (body vs weight/shape words)

Table 5: Mean and Standard Deviation of words recalled in each category

Word Type	Bulimics N=12	Depressed N=12	Controls N=18
Body	6.75 (3.82)	7.08 (4.54)	11.06 (2.84)
Weight/shape	6.67 (2.35)	3.67 (2.64)	8.06 (2.92)

standard deviation in parentheses

A two way analysis of variance [group by word type (body vs weight/shape)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 16.27, p < .0001$) which showed that more general body words than weight/shape words were recalled. There was a main effect of group ($F(2,39) =$

9.28, $p < .001$). However, these main effects were modified by a significant group by word type interaction ($F(2,39) = 3.54$, $p < .039$). Within group analyses using post hoc Tukey tests indicated that both the female controls and the depressed group showed a selective recall bias towards neutral body words compared to weight/shape words (both comparisons, $p < .05$). However, the bulimic group did not demonstrate a significant difference between recall of neutral body words and weight/shape words.

Between group analyses, using post hoc Tukey tests indicated that the bulimic group recalled significantly more weight/shape words than the depressed group ($p < .025$), as did the female controls ($p < .0001$), but that the bulimic group did not differ significantly from the female control group in recall for weight/shape words. Furthermore, the female control group recalled significantly more body related words than both the depressed and bulimic groups (both comparisons, $p < .05$), but there was no significant difference in recall of body words between the depressed and bulimic groups.

3.2.3: Hypothesis 2) Women with bulimia nervosa will recall a greater number of food words than neutral words compared to depressed and female controls.

Recall bias for food words will not be associated with hunger.

This hypothesis was tested by analysing the mean recall of all food words compared to neutral nouns, by the three groups. The means and standard deviations are presented in Table 6, below.

Relationship between hunger and recall of food words

The relationship between hunger and recall of food words was assessed. Data from the hunger scales provided information on subjective ratings of hunger at the time of the experiment, how much participants thought they could eat and, time since the last meal and time until the next meal (see Appendix 3).

Ratings of hunger and quantity of food that could be eaten, were obtained using Likert Scales and were therefore ordinal level data. Kruskal-Wallis analysis of variance found that there was no difference in hunger between the three groups ($X^2(2) = 1.09$, $p > .05$), or in amount of food ($X^2(2) = .871$, $p > .05$). A new variable 'time' was computed, by adding time from last meal to time until next meal in order to obtain total time without food. Using one way analysis of variance no significant difference in 'time' was found between the three groups ($F(2,38) = 1.18$, $p > .05$).

The specific relationship between hunger and recall of food words was explored using non-parametric Spearman rho correlation analysis. Hunger and quantity of food that could be eaten were significantly correlated across the three groups ($r = .669$, $p < .0001$). This relationship between hunger and amount of food that could be eaten might be expected if the hunger scales were a reliable and valid measure of hunger.

Non-parametric Spearman rho correlation analysis of hunger ratings and number of food words recalled found that, recall of food words was significantly correlated with hunger in the bulimic group ($r = .682$, $p < .015$), and in the depressed group ($r = .643$, $p < .024$), but not in the female control group. It was therefore not appropriate to use hunger ratings as a covariate, because the assumption of homogeneity of regression would not be met (see Appendix 11).

Quantity of food that could be eaten was not significantly correlated with recall of food words between the three groups. Pearson correlation analysis of 'time' (total time without food) with recall of food words between the three groups was also not significant (see Appendix 11).

Two Way Analysis of Variance of Group by Word Type (nouns vs food words).

Table 6: Mean and Standard Deviation of words recalled in each category

Word Type	Bulimics N=12	Depressed N=12	Controls N=18
Nouns	3.5 (2.35)	2.92 (2.75)	6.44 (2.89)
Food	6.42 (2.54)	5.25 (3.77)	7.39 (3.76)

standard deviation in parentheses

A two way analysis of variance [group x word type (noun vs food)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 15.94, p < .0001$), which showed that overall more food words were recalled than neutral nouns. There was also a main effect of group ($F(2,39) = 4.57, p < .016$). However, the interaction of group by word type was not significant ($F(2,39) = 1.44, p > .05$). Post hoc Tukey tests of the main effect of group indicated that the female controls recalled significantly more words than the depressed and bulimic groups (both comparisons, $p < .05$).

3.2.4: Hypothesis 3a) Women with bulimia nervosa will recall a greater number of weight/shape words than emotion words compared to depressed and female controls.

In this study weight and shape related words have been conceptualised as words of emotional significance to women with bulimia nervosa. An analysis comparing the category of emotion words to the category of weight/shape words was conducted to establish whether the observed bias to recall weight/shape related words reflected a bias towards emotional information in general. The means and standard deviations are presented in Table 7, below.

Two Way Analysis of Variance of Group by Word Type (emotion vs weight/shape words).

Table 7: Mean and Standard Deviation of words recalled in each category

Word Type	Bulimics N=12	Depressed N=12	Controls N=18
Emotional	3.58 (2.61)	3.92 (2.97)	7.33 (2.89)
Weight/shape	6.67 (2.35)	3.67 (2.64)	8.06 (2.92)

standard deviation in parentheses

A two way analysis of variance [group x word type (weight/shape vs emotion)] with repeated measures on the second factor was carried out. Again, there was a main effect of group ($F(2,39) = 8.83, p < .001$), and a main effect of word type indicating more weight/shape words were recalled than emotion words overall, ($F(1,39) = 15.12, p < .0001$). The main effects were modified by a two way interaction of group by word type ($F(2,39) = 17.91, p < .0001$). Within group analysis using post hoc Tukey tests, indicated that the bulimic group showed a bias to recall more weight/shape words than emotion words ($p < .01$). However, the depressed and female control groups showed no significant difference in recall between weight/shape words and emotion words.

Post hoc between group analyses using Tukey tests indicated that the female control group recalled significantly more weight and shape related words than the depressed group ($p < .0001$), but not the bulimic group. The female control group also recalled significantly more emotion words than the both the depressed and bulimic groups (both comparisons, $p < .001$). The bulimic group recalled significantly more weight and shape related words than the depressed control group ($p < .025$).

3.2.5: Hypothesis 3b) Women with bulimia nervosa will recall a greater number of food words than emotion words compared to depressed and female controls.

Again food related words have been conceptualised as words of emotional significance to women with bulimia nervosa. An analysis comparing the category of emotion words to the category of food related words was conducted to establish whether women with bulimia demonstrate a recall bias specific to food related words or emotional information in general. The means and standard deviations are presented in Table 8, below.

Two Way Analysis of Variance of Group by Word Type (emotion vs food words).

Table 8: Mean and Standard Deviation of words recalled in each category

Word Type	Bulimics N=12	Depressed N=12	Controls N=18
Emotion	3.58 (2.61)	3.92 (2.97)	7.33 (2.89)
Food	6.42 (2.54)	5.25 (3.77)	7.39 (3.76)

standard deviation in parentheses

A second two way analysis of variance [group x word type (emotion vs food)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 11.62, p < .002$), which showed that more food words were recalled, and a main effect of group ($F(2,39) = 4.16, p < .023$). The main effects were modified by a significant two way interaction of group by word type ($F(2,39) = 4.04, p < .025$). Between group post hoc Tukey tests indicated that the female controls recalled significantly more emotion words than the bulimic and depressed groups (both comparisons, $p < .01$). Within group post hoc Tukey tests demonstrated that both the depressed and bulimic groups recalled significantly more food than emotion words (both comparisons, $p < .05$).

3.2.6: Hypothesis 4a) Women with bulimia nervosa will recall a greater number of negative weight and shape words than negative emotional words compared to female and depressed controls.

This was to establish whether women with bulimia demonstrate a bias to negative weight and shape related words, and that, bias to recall negative weight/shape words was not due to a general bias to recall negative information. Recall for negatively valenced words was compared to positively valenced words in order to assess whether the bias to recall negative weight/shape words demonstrated by Sebastian et al. (1996) is specific to negative weight/shape words. The two way interaction of group by word type (emotion vs weight/shape) is not presented below, as it has already been presented in the analysis of hypothesis 3a.

Three way analysis of variance of group by word type (weight/shape vs emotion) by valence (positive vs negative)

Table 9: Mean and Standard Deviation of words recalled in each category

	Positive weight/shape	Negative weight/shape	Positive emotion	Negative emotion
Bulimics N=12	3.67 (1.83) ^a	3.00 (1.28)	1.83 (1.59)	1.75 (1.29)
Depressed N=12	1.75 (1.82)	1.92 (1.08)	1.58 (1.38)	2.33 (1.83)
Controls N=18	4.06 (1.98)	4.00 (1.37)	3.61 (1.65)	3.72 (1.84)

^a=standard deviation

A three way analysis of variance [group x word type (emotion vs weight/shape) x valence (positive vs negative)] with repeated measures on the second and third factors was carried out. There was no main effect of valence ($F < 1$, NS) indicating that there was no significant difference in the number of positive and negative words recalled

overall. There was a main effect of group ($F(2,39) = 8.832, p < .001$), and a main effect of word type ($F(1,39) = 15.12, p < .0001$), indicating that significantly more weight/shape words than emotion words were recalled. The two way interaction of group by valence was not significant ($F < 1, NS$). However, there was no three way interaction ($F < 1, NS$) of group by word type by valence. This finding suggests that, the prediction that women with bulimia show a recall bias towards negative weight/shape words is not supported. See means and standard deviations presented in Table 9.

Between group post hoc Tukey tests of the main effect of group showed that overall the female controls recalled significantly more words than the bulimics and depressed (both comparisons, $p < .05$).

3.2.7: Hypothesis 4b) Women with bulimia nervosa will recall a greater number of negative food words than negative emotional words compared to female and depressed controls.

Again, this was to establish whether women with bulimia demonstrate a bias to recall negative, fat food related words, and that, bias to recall negative, fat food words was not due to a general bias to recall negative information. The two way interaction of group by word type (emotion vs food) is not presented below, as it has already been presented in the analysis of hypothesis 3b.

Table 10: Mean and Standard Deviation of words recalled in each category

	Positive nonfat food	Negative fat food	Positive emotion	Negative emotion
Bulimics N=12	3.42 (1.56)	3.08 (1.77)	1.83 (1.59)	1.75 (1.29)
Depressed N=12	2.92 (2.35)	2.33 (1.87)	1.58 (1.38)	2.33 (1.83)
Controls N=18	3.78 (2.16)	3.78 (2.1)	3.61 (1.65)	3.72 (1.84)

standard deviation in parentheses

A three way analysis of variance [group x word type (emotion vs food) x valence (positive vs negative)] with repeated measures on the second and third factors was carried out. There was no main effect of valence ($F < 1$, NS), but there was a main effect of word type ($F(1,39) = 13.47$, $p < .001$), indicating that significantly more food words than emotion words were recalled. There was also a main effect of group ($F(2,39) = 4.51$, $p < .017$). The two way interaction of group by valence was not significant ($F < 1$, NS). There was no three way interaction of group by word type by valence ($F < 1$, NS). The prediction that women with bulimia would demonstrate a recall bias towards negative fat food words was not supported. See means and standard deviations presented in Table 10.

Between group post hoc Tukey test of the main effect of group showed that the female controls recalled significantly more words than the bulimic and depressed groups (both comparisons, $p < .05$).

Section 4: Discussion

4.1: Overview of Discussion

There were three main aims of this study. The first aim was to investigate whether women with bulimia nervosa demonstrate a general memory bias towards weight and shape related words, and towards food related words, compared to neutral words. The second aim was to investigate whether memory biases are specific to weight and shape related words and not also found for body related words. The third aim was to establish whether memory biases were specific to weight and shape related words and to food related words and not also found for emotional words, both in general and, in particular, for negatively valenced words. A summary of the research findings will be presented first, and will be followed by a discussion of the methodological considerations. Finally, interpretation of the main research findings, with implications for clinical practice and future research will be discussed in the light of the results of this study.

4.2: Summary of the Research Findings.

Analysis of the recall data indicated that women with bulimia nervosa did not demonstrate a bias towards weight and shape related words when these were compared with neutral nouns. Although this may have been significant if larger samples had been used. They did however, demonstrate a bias to recall weight and shape related words compared to the female and depressed control groups, when weight and shape related words were compared with neutral body words. Post hoc tests indicated that the depressed and female control groups demonstrated a significant bias towards the neutral, body words, compared to the weight and shape related words. Furthermore, the bulimic group recalled more weight and shape related words than the depressed control group. The finding that the bulimic group did not demonstrate enhanced recall for neutral, body words, compared to the other groups, suggests that the bulimic group were biased towards the weight and shape related words.

These findings are in accordance with those of Sebastian et al. (1996), although they found significantly enhanced recall for weight and shape words compared to neutral nouns, and neutral, body words, in bulimic women. The differences in the findings, may be accounted for by technical differences, for example Sebastian et al. (1996) used different word stimuli. Furthermore, Sebastian et al. (1996) used a mixed group of eating disordered women, and it may be hypothesised that anorexic women demonstrate different processing biases to bulimic women.

The hypothesis that women with bulimia nervosa would demonstrate a bias to recall weight and shape related words compared to emotion related words was also supported. Thus demonstrating that, enhanced recall is specific to weight and shape related information, and does not reflect a general bias towards emotional information. However, the bulimic group did not demonstrate enhanced recall for negatively valenced weight and shape related words. The results indicated that women with bulimia nervosa demonstrate a bias to recall both negative and positive, weight and shape related words. This was despite the finding that the bulimic group had levels of depression which were comparable to the depressed control group. However, it is notable that the depressed group also did not demonstrate a significant bias to recall emotion related words, compared to other word categories. Cognitive research using information processing paradigms mostly suggests that individuals with depression demonstrate a bias to recall negative emotional information (Dalglish & Watts, 1990). Although the finding was not significant the depressed group demonstrated a non-significant trend to recall emotion related words, particularly negatively valenced emotional words and a bias towards the negative weight and shape related words. This finding may have been significant if a larger sample had been used.

The hypothesis that women with bulimia nervosa would demonstrate a bias to recall food related words, and that this bias would not be accounted for by hunger was not

supported. Although analysis of the data suggested that the bulimic group recalled significantly more food related words, this finding was not specific to the bulimic group, the depressed control group also demonstrated a significant bias to recall food related words. However, in both groups recall of food related words was correlated with levels of hunger. Previous research has demonstrated that women with bulimia nervosa demonstrate attentional biases towards food related information (M. Cooper & Todd, 1997; M. Cooper et al., 1992), and King et al. (1991) found memory biases towards food related information. However, such research has not included an appropriate psychiatric control group and has not accounted for levels of hunger at the time of the experiment (M. Cooper, 1997). It was further hypothesised that the bulimic group would demonstrate a bias to recall negatively valenced fat related, food words. However, no difference was found in the selective recall of negative, fat related, food words and positive, thin related, food words, in women with bulimia nervosa.

In summary, women with bulimia nervosa demonstrate a bias to recall weight and shape related words compared to neutral body words. The bulimic group did not demonstrate enhanced recall for emotional words. Memory biases were not specific to negative weight and shape related words, but were also found for positive weight and shape related words. Memory biases for food related words were not found to be specific to women with bulimia, but were also found in women with depression. In both groups the recall bias for food related words was found to be related to levels of hunger.

4.3: Methodological Considerations.

Interpretation of the above findings were made in the light of the methodological limitations of this study, relating to the sample, the measures, the word stimuli, and the paradigm. These are discussed below.

4.3.1: The sample

The sample size of the depressed and bulimic groups was relatively small, with only 12 participants in each group, compared to 18 in the female control group. Thus, generalization of these findings may be limited. Furthermore, many of the bulimic and depressed women who were invited to take part in the study, declined to do so, or having consented to take part, failed to attend. The sample may not, therefore, be representative.

Most of the questionnaire data (eg the RSE, BDI, and EDBQ) suggest that the responses of the bulimic, depressed and control groups are broadly comparable to the findings of other studies (eg. M. Cooper & Fairburn, 1993). It is notable that the mean score on the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979) for the bulimic group (30.08, S.D.=10.54) was considerably lower than that reported in the literature, for example the bulimic group used by M. Cooper & Fairburn (1993) scored an average of 48.2 (S.D.=16.8), similarly Fairburn et al. (1991) report a mean score of 45.6 (S.D.= 13.5) in women with bulimia. However, Fairburn et al. (1991) obtained their sample from a waiting list. While the clinical samples used in this study met DSM-IV criteria, this discrepancy may be accounted for because the clinical samples were composed of women on the waiting list and women in treatment. Those participants in the bulimic group, who were in treatment were receiving cognitive-behavioural therapy. This may have led to a decrease in dysfunctional attitudes towards eating in these participants.

While the three groups were selected for age (18-35 years) and BMI (19-25), a significant difference was found in age between the three groups. Visual inspection of the data indicated that the depressed group was composed of women towards the upper end of the specified age range. In attempting to obtain a female depressed control group, it was notable that within the age range of 18-35 years, many women referred to adult mental health services also had some concurrent symptoms of an

eating disorder, or history of an eating disorder. Many women who presented with only major depression tended to be older. This may reflect referral patterns, particularly to psychology departments, or may be indicative of the nature of mental health problems in young women. Furthermore, the depressed female control group did not demonstrate the predicted recall bias towards negatively valenced words. However, there was a non-significant trend. This may be due to small sample sizes and if a larger sample had been used this may have been significant, or due to the selective nature of the depressed group, that is only young women. However, while there is general agreement in the literature that individuals with depression demonstrate mood congruent recall biases, the findings are not consistent (Mathews & MacLeod, 1994).

Furthermore, once identified depressed women tended to be less motivated to take part in research, and so the response rate in this group was lower compared to the bulimic and female control groups. Due to difficulties obtaining a non-eating disordered, depressed control group it was necessary to accept two participants, who were currently dieting. This may have inflated the recall bias towards food related words observed in the depressed group, although visual inspection of the raw data for these two participants does not support this suggestion.

Demographic data indicated that all participants in the female control group attended higher education, compared to only a third of the depressed group and a quarter of the bulimic group. This may account for the higher number of words recalled overall by the female control group. However, the difference in mean scores on the Mill Hill was not significant between the three groups. The total number of words recalled was positively correlated with Mill Hill scores across the three groups. The Mill Hill was not significantly correlated with recall of specific word categories. It may be assumed that intellectual ability might influence total recall of words, but not selective recall bias.

4.3.2: The Measures

The self report measures used in this study were selected on the basis of established reliability and validity, as well as being measures which have been widely used in research on eating disorders. However, while the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979) has been extensively used in research on bulimia nervosa, it was designed as a measure of symptoms in anorexia nervosa. It may not therefore provide a precise measure of bulimic symptomology. Furthermore, the EAT includes questions which are not specific to eating disorders, such as a question about early morning waking, which overlaps with depression and is therefore not a measure specifically of eating attitudes. Similarly, the Beck Depression Inventory (BDI; Beck et al., 1961) includes questions concerning weight and appetite. This may artificially inflate or deflate scores on these measures. However, Pulos (1996) found that the BDI is a valid measure of depression in women with bulimia nervosa and does not reflect overlap with eating disorder symptomology.

Of further importance, although used in previous research (Channon et al., 1988), the hunger scales used in this study did not have established reliability and validity. A positive correlation was found between amount of food that could be eaten and levels of hunger, suggesting that these may be reliable and valid measures. However, this study may have been improved by more extensive investigation of the reliability and validity of the hunger scales, and the findings related to these measures should, therefore, be treated with some caution.

4.3.3: The Word Stimuli

In order to demonstrate selective recall bias it was necessary to generate categories of word stimuli which were, as far as possible unambiguous and perceived as either neutral, negative or positive in emotional tone. The words used in this study were categorised and rated for emotional tone by 14 female post-graduates. However, it is possible that non-clinical individuals may categorise such words and, perceive the

emotional tone of words, differently to women with bulimia nervosa, which may be a confounding factor. This may be demonstrated by the food related words, which were rated as fat related or thin related, as it was expected that non-clinical raters might perceive such words as 'chocolate' differently to women with bulimia nervosa.

Furthermore, fat related food words were conceptualised as negative in emotional valence and non-fat related food words were conceptualised as positive. However, it is not known how bulimic women might perceive these words. Formea & Burns (1996) found that women with bulimia nervosa rated eating disorder related words, including food words as significantly more emotionally unpleasant than non-bulimic women. Furthermore, in order to match word categories for frequency it was necessary to include some words which were slightly ambiguous or were homonyms, such as 'blubber'.

Gardner et al. (1987) found that word frequency may influence performance on information processing tasks. All word categories in this experiment were matched for frequency. The relative frequency of words in the English language was obtained from Carroll et al. (1971). However, this is an American publication and is twenty-five years out of date. The frequencies in this book are also based on the written language only, and were obtained by computer count of published texts. It was notable that the frequency of a word could change drastically depending on if it was singular or plural. It is therefore difficult to determine the reliability of frequency control in this experiment. Furthermore, it was not possible to match all word categories for number of syllables. Thus, only salient pairs of word categories were matched for number of syllables.

Other uncontrolled aspects of the words used are concreteness and imagery. This may be important because some categories of words, for example neutral nouns, were concrete, whereas other categories were composed of adjectives. Gilhooly & Logie (1980) suggest that factors such as frequency, imageability and concreteness may

influence retrieval from lexical memory, such that words which are more concrete and imageable are more readily retrieved. Furthermore, the neutral nouns did not form a distinct category, whereas the other words were categories such as 'food words'.

Research on attentional biases in anxiety suggests that responses may be enhanced if the word stimuli form distinct categories compared to non-categorical words (Broadbent & Broadbent, 1988). Furthermore, in this study some participants reported using a mnemonic, which aided memory of 'body' words, in which the participant would think about parts of the body from head to foot, and decide whether they could remember hearing the word during the experimental task.

4.3.4: The Paradigm

In order to undertake this task participants were required to listen to a twenty minute tape of words. This was, therefore, a passive task, demanding concentration and attention. The capacity of individuals with high levels of depression to do this task may have been limited by features of depression, such as poor concentration and psychomotor retardation. The depressed participant who scored 50 on the BDI for example, only accurately recalled three words in total. An alternative paradigm for evaluating recall bias is that of autobiographical memory, which may not be subject to these effects. However, a limitation of autobiographical memory research is that it is difficult to determine whether individual differences in recall reflect retrieval processes or individual variations in past experience. The paradigm utilised in this study in which participants were required to recall words, is able to account for individual differences in retrieval, because it is a test of memory for stimulus information to which all participants have had equivalent previous exposure (Mathews & MacLeod, 1994).

4.4: Interpretation of Research Findings.

The main finding of this study was that women with bulimia nervosa demonstrate enhanced recall for weight and shape related information, and this bias is towards both positive and negatively valenced weight and shape related words. According to the

cognitive model of Williams et al. (1988) memory for schema congruent information reflects a process of elaboration, in which associative links between representations in memory are strengthened. Enhanced recall for weight and shape related words supports the proposition of Fairburn et al. (1986) and Vitousek & Hollon (1990) that concerns with weight and shape represent the core psychopathology of bulimia nervosa.

The finding that bulimic women also demonstrate recall biases towards positive weight and shape related words, suggests that positive information about weight is more elaborately encoded and readily retrieved, and may also therefore be important in the maintenance of bulimia nervosa. This finding when considered in the light of responses on the Eating Disorder Beliefs Questionnaire (EDBQ; M. Cooper et al., 1997), suggests that women with bulimia ascribe meaning to the constructs of both 'thinness' and 'fatness', as proposed by Vitousek & Hollon (1990).

Enhanced recall of food related words was demonstrated by both the bulimic and depressed group. In both groups this recall bias was found to be positively correlated with hunger. This finding suggests that enhanced recall for food related information may be a state dependent processing bias. This is further supported by the finding that the female control group did not demonstrate a memory bias for food related words, and hunger was not correlated with recall for food words in this group. However, it was not possible to determine from the study the relative contribution of hunger and possible schema driven memory biases for food related words. The finding that recall biases for food related words was also demonstrated in women with depression, suggests that concerns with food may not be the core psychopathology of bulimia nervosa, but are secondary to concerns about weight and shape, as proposed by Fairburn et al. (1986).

However, as discussed, research on attentional biases has found that women with bulimia nervosa demonstrate attentional biases towards food related words (eg. M. Cooper & Todd, 1997). This research suggests that information processing of food related stimuli may be important in the maintenance of bulimia nervosa. However, to date, the research on attentional biases in bulimia nervosa has not accounted for levels of hunger at the time of testing. One study on anorexia nervosa, which did account for levels of hunger is that of Channon et al. (1988). This study found that attentional biases towards food related words were not due to hunger. These results, combined with the results of the current study raise the possibility that different processing biases may be demonstrated for different stimuli in women with different eating disorders. According to the model of Williams et al. (1988) attention is associated with the automatic process of integration, which facilitates the detection of threat. Attentional biases towards food related words may reflect integration processes of the detection of threat. However, it remains to be established that attentional biases to food related stimuli in women with bulimia nervosa are not due to levels of hunger. It also remains to be established whether or not attentional biases towards food related stimuli are also found in relevant psychiatric control groups including, as in the current study, young women with a diagnosis of depression.

Memory biases for food related words observed in the depressed women may be best accounted for by hunger, but may also be due to symptoms of depression, such as appetite change. Alternatively, food related words may be conceptualised as emotional information, and recall bias for food related words may reflect a general bias towards emotional information in depressed women. However, the depressed women in the current study demonstrated enhanced recall for food words compared to emotional words. Cultural explanations, which might suggest that women have greater concerns with food related information (Smukler & Patton, 1995) are ruled out, as the female control group did not demonstrate enhanced recall for food related words.

Data from the BDI, the Rosenberg Self Esteem Scale (RSE; Rosenberg, 1965) and the EDBQ (M. Cooper et al., 1997) indicate that the bulimic group had comparable levels of depressed mood, low self esteem and comparable negative self beliefs, to the depressed control group. However, the bulimic group did not demonstrate memory biases towards mood congruent words, such as the negative emotional and negative weight and shape words. While, the findings also indicated that the depressed control group did not demonstrate a significant bias towards negative emotional words, there was a non-significant trend in this direction. The trend in the current study and findings from attentional bias studies suggest that there is a complex interaction between information processing, depressed mood and the symptoms of bulimia nervosa. This is supported by research using the Stroop paradigm, on attentional biases in bulimia, in which the Stroop interference effect has been partly accounted for by depressed mood (eg. M. Cooper et al. 1992; Poulakis & Wertheim, 1993). However, there has been a failure to find attentional biases in clinical depression, using the Stroop paradigm (Power & Dalgleish, 1997).

Fairburn & P. Cooper (1996) suggest that feelings of depression are a secondary psychological response to loss of control over eating. P. Cooper & Fairburn (1986) found that the nature of depressive symptoms in women with eating disorders are related directly to the eating disorder, for example, excessive guilt in response to a minor dietary indiscretion. However, scores on the EDBQ (M. Cooper et al., 1997) suggest that women with bulimia have negative self schemata, expressed in beliefs such as 'I am worthless'. The current study indicates that these are comparable to those in young women with depression. The explanation of depressed mood as a secondary psychological consequence does not therefore fully account for the operation of negative self schemata.

Vitousek & Hollon (1990) propose that negative self schemata in women with eating disorders do not operate independently, but operate in conjunction with weight related

schemata. The role of the conjunction of different beliefs in determining the specific nature of psychological disturbance has also been proposed by M. Cooper et al. (in press), who suggest it is the conjunction of general negative self beliefs with assumptions concerning weight, shape and eating which result in a specific behavioural and cognitive profile that is characteristic of eating disorders. The findings of this study provide some support for this proposition.

The presence of both negative self schemata and weight related schemata raises interesting ideas about their inter-relationship. The results of the EDBQ (M. Cooper et al., 1997) and RSE (Rosenberg, 1965) suggest that women with bulimia have negative, unconditional beliefs about the self. The EDBQ (M. Cooper et al., 1997) further identifies conditional beliefs about weight and shape, such as 'if I lose weight people will care about me'. It may be hypothesised that conditional beliefs about weight and shape have a modifying role on unconditional negative beliefs about the self. This might provide some insight as to why attitudes to weight and shape are resistant to change in women with eating disorders, because to give-up assumptions about weight and shape is to be faced with the self as worthless and bad.

4.5: Clinical Implications

The findings of this study provide empirical support for the presence of memory biases towards weight and shape related information, but not food related information, in women with bulimia nervosa. Furthermore, women with bulimia were found to have levels of depressed mood and negative self beliefs comparable to the depressed control group, but did not demonstrate information processing biases congruent with depressed mood. According to cognitive models, information processing biases may be important in the maintenance of clinical disorders. These findings have implications for cognitive-behavioural interventions in the treatment of bulimia nervosa.

The finding that women with bulimia nervosa demonstrate self referent memory biases for weight and shape related information provides a useful focus for intervention. M. Cooper (1997) in her discussion of interpretation biases, suggests that as well as focusing on content of thoughts and beliefs in cognitive therapy, it may also be important to increase the individual's awareness of processing biases, and utilise strategies to change biases in interpretation. Such strategies might usefully be extended to memory biases, an aim of cognitive therapy might be to increase the cognitive availability or salience of alternative memories. This might counterbalance a bias to recall information of great personal significance, associated with weight and shape. Furthermore, Williamson (1996) suggests that from the perspective of cognitive network theories, such as that of Bower (1981), it might be expected that memories associated with weight and shape will also be associated with emotional memories. Activation and exploration of dysfunctional memories associated with weight and shape, may provide useful content for cognitive therapy.

The finding of the current study that women with bulimia nervosa demonstrate memory biases for both positive and negative weight and shape related information, suggests that cognitive processing in women with bulimia nervosa is not similar to the negative memory bias associated with depression, as suggested by Sebastian et al. (1996). Memory bias for positive weight and shape related information may also be important in the maintenance of bulimia nervosa and the focus of cognitive therapy should not therefore be limited to the content of negative thoughts related to constructs of fatness, but should include thoughts about being thin.

According to cognitive models, such as that proposed by Vitousek & Hollon (1990) information processing biases arise from cognitive structures about the self and about weight and shape. An important focus of intervention might be beliefs and underlying assumptions about weight and shape. The findings of this study suggest that beliefs and assumptions about what it means to be fat, and what it means to be thin, are an

important focus of cognitive therapy. Vitousek (1996) suggests that this might usefully be done by utilising strategies such as, exploring the pros and cons of each.

The lack of memory biases for food related words demonstrated in the current study, does not however, suggest, that attitudes to food and eating should not be a focus of cognitive intervention. This finding provides support for the proposition of Fairburn et al. (1986) that attitudes to food and eating are secondary to attitudes about weight and shape. The role of eating attitudes and behaviour may therefore be important in the maintenance of weight and shape related schemata. M. Cooper et al. (in press) found that bulimic women reported, that dieting functioned to counteract negative beliefs about the self. According to M. Cooper et al. (in press) eating behaviours in bulimia nervosa may represent types of schema compensation in which behaviours and cognitions are attempts to cope with early traumatic experiences, or may be a means of cognitive and emotional avoidance used to avoid triggering a schema and the associated affect.

Consideration of the relationship between eating behaviours and attitudes to weight and shape, suggests it is important for the clinician to be aware that intervention at the level of eating behaviours, may activate distressing schema concerning weight and shape and the self. This suggests that in the management and treatment of eating attitudes and behaviour, attention should be given to developing coping strategies, such as thought challenging and relaxation techniques, in the individual with bulimia nervosa. Vitousek (1996) argues that for individuals with bulimia nervosa the elimination of chaotic eating behaviour and the establishment of normal eating patterns, is a prerequisite for effective psychotherapy. An initial focus on eating attitudes and behaviour may provide clinical insight into attitudes to weight and shape, for example through the self monitoring of eating habits and associated affect and cognition, as used in the cognitive approach. This information may provide the basis for behavioural experiments and for further exploration of dysfunctional beliefs.

Furthermore, successful intervention at the level of eating attitudes and behaviour may lead to an increase in self esteem and self efficacy, as the bingeing and purging behaviours in bulimia nervosa are associated with feelings of self-disgust and guilt (Fairburn et al., 1986).

The findings of the current study suggest there is a complex relationship between depressed mood and the symptoms of bulimia nervosa. Overall, women with bulimia nervosa did not demonstrate a memory bias towards general negative emotional information, including negative weight and shape related information, as might be expected in depression. Thus, it cannot be assumed that depressed mood in bulimic women is clinically the same as major depression. It may be useful to identify the particular associations between depressed mood and bulimic symptomology in the treatment of bulimia nervosa.

Clinical observations of individuals suffering from bulimia suggest they experience affective changes across the binge-purge cycle, which are closely related to bulimic behaviours (Beebe, 1994). Observations such as these highlight the need to address cognitive correlates of both depressed mood and bulimia nervosa. Schlesier-Carter et al. (1989) suggest that depressed mood may operate in such a way as to undermine treatment, for example minimization of successes and magnification of treatment failures. Depressed mood has been identified as a trigger to binge eating P. Cooper & Fairburn (1986). It may therefore be important to facilitate the development of alternative coping strategies to manage feelings of depression in women with bulimia nervosa.

The EDBQ (M. Cooper et al., 1997) questionnaire data provided support for the presence of negative self beliefs in women with bulimia nervosa. Vitousek & Hollon (1990) propose that beliefs about the self are linked to beliefs about weight and shape. This data suggests that beliefs about the self as well as attitudes to weight and shape

might be an important focus of cognitive therapy. Furthermore, it may be important to explore the relationship between depressed mood and negative self beliefs and their association with attitudes to weight and shape, in women with bulimia nervosa.

In summary, the findings of the current research provide evidence that attitudes to weight and shape represent the core psychopathology of bulimia. In the treatment of bulimia nervosa attitudes to weight and shape should be considered central to the maintenance of the disorder. This is supported by outcome research, for example Fairburn et al. (1993) found that at post treatment, the likelihood of relapse was associated with degree of attitudinal disturbance towards weight and shape. Overall, consideration of the results of the current study in the light of other research findings, suggests there is a complex relationship between schemata, mood and, eating attitudes and behaviour in women with bulimia. In order for more effective treatment there is a need for further research into how these cognitive, affective and behavioural symptoms interact to maintain bulimia nervosa.

4.6: Suggestions for Future Research

In the light of the methodological limitations of this study, future investigations into memory biases might be improved by using larger samples, which would increase statistical power and external validity. Furthermore, the current study would have been improved by the inclusion of a neutral category of words rather than the neutral non-categorical nouns used in this study, in order to control for category effects.

The current study may usefully be extended by the inclusion of a group of women with anorexia nervosa. Currently, cognitive-behavioural models of eating disorders emphasise a close correspondence between the belief systems of anorexics and bulimics. This assumption suggests that that differences in symptom presentation result from independent variables, which are unrelated to the core psychopathology of eating disorders. This is supported by clinical observations for example, that

individuals often qualify for both diagnoses and bulimics often have a history of anorexia (Fairburn & P. Cooper, 1984). However, as Vitousek (1996) suggests differences between eating disorder subtypes may be represented at the level of cognitive schemata. Future research on information processing, in which both anorexics and bulimics are compared within the same experimental design, may provide further insight into the cognitive models of bulimia and anorexia.

The findings of the current study highlight the need for further exploration of the relationship between hunger and the differential processing of food related information. From the findings of this study enhanced recall may be best accounted for by levels of hunger. However, the measures of hunger used did not have established reliability and validity. Furthermore, research on attentional biases has demonstrated that both women with bulimia and women with anorexia demonstrate attentional biases towards food and eating related stimuli. It remains to be established whether women with eating disorders demonstrate differential information processing biases towards different stimuli, for example attentional bias towards food related information and memory biases for weight and shape related information, or whether all biases towards food are a state dependent bias, due to levels of hunger. This may be investigated for example, by experimental manipulation of hunger.

A criticism often levelled at information processing research is that inconsistencies in data between studies may be attributable to technical variations in materials, procedures and analyses (Vitousek, 1996; Huon & Brown, 1996). Future research on attentional biases and memory biases may benefit from the investigation of both processes within one study, thereby utilising the same materials and eliminating some of the methodological variance.

Future research on attention, interpretation and recall in bulimia nervosa and anorexia nervosa may usefully be extended by empirical investigation of the relationship

between eating disorders and depression. The inclusion of a depressed control group and stimuli associated with depression, may provide further evidence of information processes which are specific to bulimia and to anorexia. Furthermore, the role of depressed mood in eating disorders may be empirically tested through the use of mood induction procedures, such as those of Velten (1968).

4.7: Conclusions

In summary, the main conclusions of this study are that memory biases for weight and shape related information were specific to women with bulimia nervosa, which suggests that attitudes to weight and shape represent the core psychopathology of bulimia nervosa. Furthermore, memory biases were demonstrated towards positively as well as negatively toned weight and shape words. It may be concluded that the cognitive processing of individuals with bulimia nervosa is not therefore similar to the negative memory bias associated with depression. Overall, memory bias for food related information was best accounted for by levels of hunger. However, it is not possible from this study to fully exclude the role of schema driven processing biases for food and eating related information.

References

- Agras S. & Kirkley B. (1986) *Bulimia: Theories of Aetiology*. In K. Brownell & J. Foreyt (Eds). *Physiology, Psychology and Treatment of the Eating Disorders*. New York: Basic Books.
- American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders*. Fourth edition. Washington DC: American Psychiatric Association.
- Baker J., Williamson D. & Sylve C. (1995) Body image disturbance, memory bias, and body dysphoria: effects of negative mood induction. *Behaviour Therapy*, 26, 747-759.
- Beck A., Steer R. & Garbin M. (1988) Psychometric Properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review*, Vol. 8, 77-100.
- Beck A., Ward C., Mendelson M., Mock J. & Erbaugh J. (1961) An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-71.
- Beebe D. (1994) Bulimia nervosa and depression: a theoretical and clinical appraisal in light of the binge-purge cycle. *British Journal of Clinical Psychology*, 33, 259-76.
- Blackburn I & Davidson K. (1990) *Cognitive Therapy for depression and anxiety*. Oxford: Blackwell.
- Broadbent D. & Broadbent M. (1988) Anxiety and Attentional Bias: State and Trait. *Cognition and Emotion*, 2 (3), 165-183.
- Carroll J., Davies P. & Richman B. (1971) *Word Frequency Book*. New York: American Heritage Publishing Company.
- Channon S., Hemsley D., & de Silva P. (1988) Selective processing of food words in anorexia nervosa. *British Journal of Clinical Psychology*, 27, 259-60.
- Clark D., Feldman J., & Channon S (1989) Dysfunctional thinking in anorexia and bulimia nervosa. *Cognitive Therapy and Research*, 13, 377-87.
- Cooper M. (1997) Cognitive theory in anorexia nervosa and bulimia nervosa: a review. *Behavioural and Cognitive Psychotherapy*, Vol. 25, No. 2, 113-147.
- Cooper M. (1997) Bias in interpretation of ambiguous scenarios in eating disorders. *Behaviour Research and Therapy*, Vol. 35, No. 7, 619-626.
- Cooper M., Anastasiades P. & Fairburn C. (1992) Selective Processing of Eating-, Shape-, and Weight-Related Words in Persons With Bulimia Nervosa. *Journal of Abnormal Psychology*, Vol. 101, No. 2, 352-355.
- Cooper M., Cohen-Tovee E., Todd G., Wells A. & Tovee M. (1997) The eating disorder belief questionnaire: preliminary development. *Behaviour Research and Therapy*, Vol. 35, No. 4, 381-88.

Cooper M., Clark D. & Fairburn C. (1993) An experimental study of the relationship between thoughts and eating behaviour in bulimia nervosa. Behaviour Research and Therapy, Vol. 31, 749-757.

Cooper M. & Fairburn C. (1992a) Thoughts about eating, weight and shape in anorexia nervosa and bulimia nervosa. Behaviour Research and Therapy, Vol. 30, No. 5, 501-511.

Cooper M. & Fairburn C. (1992b) Selective processing of eating, weight and shape related words in patients with eating disorders. British Journal of Clinical Psychology, 31, 363-365.

Cooper M. & Fairburn C. (1993) Demographic and Clinical Correlates of selective information processing in patients with bulimia nervosa. International Journal of Eating Disorders, Vol. 13, No. 1, 109-116.

Cooper M. & Todd G. (1997) Selective processing of three types of stimuli in eating disorders. British Journal of Clinical Psychology, 36, 279-281.

Cooper M., Todd G. & Wells A. (in press) Content, origins and consequences of dysfunctional beliefs in anorexia nervosa and bulimia nervosa.

Cooper P. (1995) Eating disorders and their relationship to mood and anxiety disorders. In Brownell K. & Fairburn C. (eds). Eating Disorder and Obesity. A comprehensive handbook. New York: Guilford Press.

Cooper P. & Fairburn C. (1986) The depressive symptoms of bulimia nervosa. British Journal of Psychiatry, 148, 268-74.

Dagleish T. & Watts F. (1990) Biases of attention and memory in disorders of anxiety and depression. Clinical Psychology Review, Vol. 10, 589-604.

Dare C. & Crowther (1995) Psychodynamic Models. In Szmukler G., Dare C., & Treasure J. (eds). Handbook of Eating Disorders. Theory, Treatment And Research. Chichester: Wiley & Sons.

Eisler I. (1995) Family Models of Eating Disorders. In Szmukler G., Dare C., & Treasure J. (eds). Handbook of Eating Disorders. Theory, Treatment And Research. Chichester: Wiley & Sons.

Fairburn C. (1987) Area Review: Bulimia Nervosa. The definition of bulimia nervosa: guidelines for clinicians and research workers. Annals of Behavioural Medicine, Vol. 9, No. 4, 3-7.

Fairburn C. & Cooper P (1984) The clinical Features of Bulimia Nervosa. British Journal of Psychiatry, 144, 238-46.

- Fairburn C. & Cooper P. (1996) Eating Disorders. In Hawton K., Salkovskis P., & Clark D. (eds). *Cognitive-Behavioural Therapy for Psychiatric Problems*. Oxford: Oxford University Press.
- Fairburn C., Cooper P., Cooper M., McKenna F. & Anastasiades P. (1991) Selective information processing in bulimia nervosa. *International Journal of Eating Disorders*, Vol. 10, No. 4, 415-422.
- Fairburn C., Cooper Z., & Cooper P. (1986) The clinical features and maintenance of bulimia nervosa. In K. Brownell & J. Foreyt (Eds). *Physiology, Psychology and Treatment of the Eating Disorders*. New York: Basic Books.
- Fairburn C., Peverler R., Jones R., Hope R. & Doll (1993) Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology*, Vol. 61, No. 4, 696-698.
- Formea G. & Burns L. (1996) Selective processing of food, weight and body-shape words in nonpatient women with bulimia nervosa: interference on the stroop task. *Journal of Psychopathology and Behavioural Assessment*, Vol. 18, No. 2, 105-118.
- Gardner M., Rothkopf E., Lapan R. & Lafferty T. (1987) The word frequency effect in lexical decision: finding a frequency based component. *Memory and Cognition*, Vol. 15, 1, 24-28.
- Garner D. & Garfinkel P. (1979) The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-79.
- Gilhooly K. & Logie R. (1980) Methods and Design: age of acquisition, imagery, concreteness, familiarity, and ambiguity measures for 1,944 words. *Behaviour Research Methods and Instrumentation*, Vol. 12, (4), 395-427.
- Guidano V. & Liotti G. (1983) *Cognitive Processes and Emotional Disorders: a structural approach to psychotherapy*. New York: Guilford Press.
- Huon G. & Brown L. (1996) Task dependence in colour naming latency among dieters. *International Journal of Eating Disorders*, Vol. 19, No. 4, 405-410.
- Jackman L., Williamson D., Nctmeyer R. & Anderson D. (1995) Do weight preoccupied women misinterpret stimuli related to body size? *Cognitive Therapy and Research*, Vol. 19, No. 3, 341-355.
- Johnson C. (1995) Psychodynamic treatment of bulimia nervosa. In Brownell K. & Fairburn C. (eds). *Eating Disorder and Obesity. A comprehensive handbook*. New York: Guilford Press.
- King G., Polivy J. & Herman P. (1991) Cognitive aspects of dietary restraint: effects on person memory. *International Journal of Eating Disorders*, Vol. 10, No. 3, 313-321.

- Levy A., Dixon K., & Stern S. (1989) How are depression and bulimia related? American Journal of Psychiatry, 146, 2, Feb., 162-9.
- Markus H., Hamill R., & Sentis K. (1987) Thinking fat: self schemata for body weight and the processing of weight relevant information. Journal of Applied Social Psychology, 17, 50-72.
- Mathews A. & MacLeod C. (1994) Cognitive Approaches to Emotional Disorders. Annual Review of Psychology, 45, 25-50.
- Mathews A., Mogg K., May J. & Eysenck M. (1989) Implicit and Explicit Memory Bias in Anxiety. Journal of Abnormal Psychology, Vol. 98, No. 3, 236-240.
- Mineka S. & Sutton S. (1992) Cognitive biases and the emotional disorders. Psychological Science, 3, 65-69.
- Mizes J. & Christiano B. (1995) Assessment of cognitive variables relevant to cognitive behavioural perspectives on anorexia nervosa and bulimia nervosa. Behaviour Research and Therapy, Vol. 33, No. 1, 95-105.
- National Research Council (1989) Diet and Health: implications for reducing chronic disease risk. Washington, DC: National Academy Press.
- Patton G. (1992) Eating Disorders: Antecedents, Evolution and Course. Annals of Medicine, 24, 281-85.
- Peck D. (1970) The conversion of Progressive Matrices and Mill Hill Vocabulary Raw Scores into Deviation IQ's. Journal of Clinical Psychology, 26, 67-70.
- Perpiñá C., Hemsley D., Treasure J. & de Silva P. (1993) Is the selective information processing of food and body words specific to patients with eating disorders? International Journal of Eating Disorders, Vol. 14, No. 3, 359-366.
- Phelan P. (1987) Cognitive correlates of bulimia: the bulimic thoughts questionnaire. International Journal of Eating Disorders, 6, 593-607.
- Poulakis Z. & Wertheim E. (1993) Relationships among dysfunctional cognitions, depressive symptoms, and bulimic tendencies. Cognitive Therapy and Research, Vol. 17, No. 6, 549-59.
- Power M. & Dagleish T. (1997) Cognition and Emotion. From order to disorder. UK: Psychology Press Publications.
- Pulos S. (1996) Validity of the Beck Depression Inventory with eating disordered patients. Educational and Psychological Measurement, Vol. 56, No.1, 139-141.
- Raven J. (1965) Guide to using the Mill Hill Vocabulary Scale with the Progressive Matrices Scale. London: H. K. Lewis.

Rosenberg M. (1965) Society and the adolescent self image. Princeton NJ: Princeton University Press.

de Ruiter C. & Brosschot J. (1994) The emotional stroop interference effect in anxiety: attentional bias or cognitive avoidance? Behaviour Research and Therapy, Vol. 32, No. 3, 315-319.

Schotte D., McNally R. & Turner M. (1990) A dichotic listening analysis of body weight concern in bulimia nervosa. International Journal of Eating Disorders, Vol. 9, No. 1, 109-113.

Silverstone P. (1990) Low self esteem in eating disordered patients in the absence of depression. Psychological Reports, 67, 276-78.

Spitzer R., Williams J. & Gibbons (1996) Instructional Manual for the Structured Clinical Interview for DSM-IV. New York: New York State Psychiatric Institute.

Strober M. (1995) Family-genetic perspectives on anorexia nervosa and bulimia nervosa. In Brownell K. & Fairburn C. (eds). Eating Disorder and Obesity. A comprehensive handbook. New York: Guilford Press.

Sebastian S., Williamson D., & Blouin D. (1996) Memory bias for fatness stimuli in the eating disorders. Cognitive Therapy and Research, 20, 275-286.

Schlesier-Carter B., Hamilton S., O'Neil P., Lydiard B., & Malcolm R. (1989) Depression and Bulimia : the link between depression and bulimic cognitions. Journal of Abnormal Psychology, Vol. 98, 322-25.

Sebastian S., Williamson D. & Blouin D. (1996) Memory bias for fatness stimuli in the eating disorders. Cognitive Therapy and Research, 20, 275-286.

Szmukler G. & Patton C. (1995) Socio-cultural Models. In Szmukler G., Dare C., & Treasure J. (eds). Handbook of Eating Disorders. Theory, Treatment And Research. Chichester: Wiley & Sons.

Teasdale J. (1995) Selective effects of emotion on information processing. In Baddeley A. & Weiskrantz L. (eds) Attention, selection, awareness and control: a tribute to Donald Broadbent. Oxford: Clarendon Press.

Vandereycken W. (1995) The families of patients with an eating disorder. In Brownell K. & Fairburn C. (eds). Eating Disorder and Obesity. A comprehensive handbook. New York: Guilford Press.

Velten E. (1968) A laboratory task for induction of mood states. Behaviour Research and Therapy, 6, 473-482.

Vitousek K. (1996) 'The current status of cognitive-behavioural models of anorexia nervosa and bulimia nervosa' in: Salkovskis P. (ed) Frontiers of Cognitive Psychology. New York: Guilford Press.

Vitousek K. & Hollon S. (1990) The investigation of schematic content and processing in eating disorders. Cognitive Therapy and Research, Vol. 14, No. 2, 191-214.

Williams J., Watts F., Macleod C. & Mathews A. (1988) *Cognitive Psychology and Emotional Disorders*. Chichester, England: Wiley.

Williamson D. (1996) Body image disturbance in eating disorders: a form of cognitive bias? Eating Disorders, Vol. 4, No. 1, 47-58.

Zotter D. & Crowther J. (1991) The role of cognitions in bulimia nervosa. Cognitive Therapy and Research, Vol. 15, No. 5, 413-426.

Appendix 1 Information Sheet for Participants

An Investigation into Thinking Patterns in Bulimia Nervosa and Depression

Information Sheet for Participants

Eating disorders and depression are distressing and upsetting. Good treatments are available, but it is hard work to overcome these problems and individuals may become disheartened when progress is slow or if they take a turn for the worse. Individuals who have problems with their eating or depression are often preoccupied with negative thoughts and distressing concerns. These can be very difficult to cope with and it is not always easy to see why they continue and why they don't go away. There is a great need for research in order to understand these preoccupations and what keeps them going. Research suggests that how an individual thinks may be an important factor and in order to get better and stay better it may be necessary to identify these patterns or ways of thinking. This is the aim of the study.

If you are willing to help with this study it will involve one visit to see me for approximately one hour. I will ask you to talk about any problems you may have with eating and depression. I will ask you to listen to an audio tape of some words and to think about these words in relation to yourself and to do two simple tasks. At the end I will ask you to complete some questionnaires.

It is emphasised that **participation is entirely voluntary** and you are under no obligation to take part in this study. Non-participation will not affect access to future medical support. Everything you tell me will be confidential.

For further information, please contact:

Trainee Clinical Psychologist.

OXFORD REGIONAL TRAINING COURSE IN CLINICAL PSYCHOLOGY
Doctorate in Clinical Psychology

COURSE DIRECTOR:
Dr Sue Llewlyn (from April 1997)

Isis Education Centre
Warneford Hospital
Warneford Lane
Headington
Oxford
OX3 7JX

Direct Line: Oxford (01865)
Tel: Oxford (01865) 226431 Course Administrator
226374 Course Secretary
Fax: Oxford (01865)226364

5th February 1997

Dear

Following the information you were sent about research into thinking patterns in women with bulimia nervosa and depression, please complete this form to say whether you are willing to take part in the study.

Name.....

D.O.B.....

Address.....
.....
.....

(circle your response)

I am / am not willing to take part in this study.

If you agree to take part, then please complete the information below.

Telephone number on which you can be contacted
.....

When you can be contacted on this number

If you cannot be contacted by phone (indicate here).....

Please return in the stamp addressed envelope provided.

Yours sincerely

Clinical Psychologist in Training

OXFORD REGIONAL TRAINING COURSE IN CLINICAL PSYCHOLOGY
Doctorate in Clinical Psychology

COURSE DIRECTOR:
Mrs. Jane Dunn, M.Phil., C.Psychol

ASSOCIATE & ACADEMIC DIRECTOR:
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Dear Dr.

Your patient

Title:

An investigation into selective memory bias in the processing of eating, weight, and shape related words in women with bulimia nervosa, depression and female non-clinical controls.

This study is being carried out by _____ as part fulfilment of training as a clinical psychologist.

Aims

Research on attention and memory biases in people with bulimia nervosa suggests that such biases maintain the eating disorder and may therefore have therapeutic implications. The aims of the study are to investigate whether patients with bulimia nervosa demonstrate a general memory bias towards eating, weight and shape related words. Furthermore, whether such memory biases are specific to negative weight, shape and eating related words and to bulimia nervosa rather than characteristic of depression. A further aim is to investigate whether people with bulimia nervosa demonstrate biases to weight and shape words specifically rather than general body related words.

Appendix 2 cont.

Procedure

Demographic information and information to confirm or exclude diagnosis will be obtained. Participants will also be asked to complete some hunger rating scales. This study involves one session of approximately one hour with the participant. In the main part of the study the participant will be required to listen to an audio tape of words. The audio tape will be of eating, weight, and shape words and non-eating disorder related words. Participants will be asked to think of a scene involving themselves and the word. After listening to the tape participants will be given a distraction task, to count backwards in 3s from 100 for 20 seconds and will then be required to recall as many of the words as possible from the audio tape. At the end of the session they will be given questionnaire measures to complete and have an opportunity to discuss the study in more detail.

An information sheet for the participants is enclosed. This sheet contains a contact number for the Investigators.

I would be grateful if you would complete the short form which is attached and return it to me in the stamped addressed envelope provided.

I would be happy to discuss this study if you require any further information.

Thank you for your assistance.

Yours sincerely

Clinical Psychologist in Training.

Appendix 2 cont.

Please complete and return this section.

Title

An investigation into selective memory bias in the processing of eating, weight, and shape related words in women with bulimia nervosa, depression and female non-clinical controls.

* 1) I am not aware of any reason why my patient should not participate in this study.

* 2) The patient should not participate in this study because:

.....
.....
.....
.....

* Delete as appropriate.

Signed.....
Date.....

Appendix 3 Eating Attitudes Test (Garner & Garfinkel 1979)

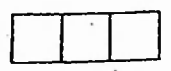
Please place an "X" under the column which best applies to each of the numbered statements. All results will be confidential. Most of the questions relate to food or eating, although other types of questions have been included. Please answer each question carefully.

Thank you.

	Always	<u>Very</u> Often	Often	Sometimes	Rarely	Never	
1. Like eating with other people.							1.
2. Prepare food for others but do not eat what I cook.							2
3. Become anxious prior to eating.							3
4. Am terrified about being overweight.							4
5. Avoid eating when I am hungry.							5
6. Find myself preoccupied with food.							6
7. Have gone on eating binges where I feel that I may not be able to stop.							7
8. Cut my food into small pieces.							8
9. Aware of the calorie content of the foods I eat.							9
10. Particularly avoid foods with a high carbohydrate content (eg bread, potatoes, rice, etc.).							10
11. Feel bloated after meals.							11
12. Feel that others would prefer if I ate more.							12
13. Vomit after I have eaten.							13
14. Feel extremely guilty after eating.							14
15. Am preoccupied with a desire to be thinner.							15
16. Exercise strenuously to burn off calories							16
17. Weigh myself several times a day.							17
18. Like my clothes to fit tightly.							18.
19. Enjoy eating meat.							19.

Always
Very
Often
Often
Sometimes
Rarely
Never

20. Wake up early in the morning.						20
21. Eat the same foods day after day.						21
22. Think about burning up calories when I exercise.						22
23. Have regular menstrual periods.						23
24. Other people think that I am too thin.						24
25. Am preoccupied with the thought of having fat on my body.						25
26. Take longer than others to eat my meals.						26
27. Enjoy eating at restaurants.						27
28. Take laxatives.						28
29. Avoid foods with sugar in them.						29
30. Eat diet foods.						30
31. Feel that food controls my life.						31
32. Display self control around food.						32
33. Feel that others pressure me to eat.						33
34. Give too much time and thought to food.						34
35. Suffer from constipation.						35
36. Feel uncomfortable after eating sweets.						36
37. Engage in dieting behaviour.						37
38. Like my stomach to be empty.						38
39. Enjoy trying new rich foods.						39
40. Have the impulse to vomit after meals.						40



Appendix 3 cont. Eating Disorders Belief Questionnaire.
BELIEFS QUESTIONNAIRE

Name:

Date:

Instructions: Listed below are different attitudes or beliefs which people sometimes hold. Please read each statement carefully and decide how much you agree or disagree with the statement. Base your answer on what you emotionally feel, not on what you rationally believe to be true. Choose the rating which best describes what you usually believe or what you believe most of the time rather than how you feel right now. Write the number in the space before the statement.

Rating Scale:

0 10 20 30 40 50 60 70 80 90 100

I do not usually
believe this at all

I am usually
completely convinced
that this is true

- 1 I'm unloveable
- 2 If my flesh is firm I'm more attractive
- 3 I'm ugly
- 4 I'm useless
- 5 I'm a failure
- 6 If I eat a forbidden food I won't be able to stop
- 7 If my stomach is flat I'll be more desirable
- 8 If I lose weight I'll count more in the world
- 9 If I eat desserts or puddings I'll get fat
- 10 If I stay hungry I can guard against losing control and getting fat
- 11 I'm all alone
- 12 If I eat bad foods such as fats, sweets, bread and cereals they will turn into fat
- 13 I'm no good
- 14 If my bottom is too large no one will take me seriously
- 15 If I eat three meals a day like other people I'll get fat
- 16 If I've eaten something I have to get rid of it as soon as possible
- 17 I'm not a likeable person
- 18 If my hips are thin people will approve of me
- 19 If I lose weight people will be friendly and want to get to know me

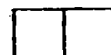
Appendix 3 cont. EDBQ (M. Cooper et al., 1997)

- 20 If I gain weight it means I'm a bad person
- 21 If my thighs are firm it means I'm a better person
- 22 I don't like myself very much
- 23 If I gain weight I'm nothing
- 24 If my hips are narrow it means I'm successful
- 25 If I lose weight people will care about me
- 26 If my body shape is in proportion people will love me
- 27 I'm dull
- 28 If I binge and vomit I can stay in control
- 29 I'm stupid
- 30 If my body is lean I can feel good about myself
- 31 If my bottom is small people will take me seriously
- 32 Body fat/flabbiness is disgusting

Appendix 3 cont. Rosenberg Self Esteem Inventory
Rosenberg (1965)

Please place an 'X' in the column which you think most nearly applies to you.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.				
2. At times I think that I am no good at all.				
3. I feel that I have a number of good qualities.				
4. I am able to do things as well as most people.				
5. I feel I do not have much to be proud of.				
6. I feel useless at times.				
7. I feel that I am a person of worth, at least on an equal plane with others.				
8. I wish I could have more respect for myself.				
9. All in all I am inclined to feel that I am a failure.				
10. I take a positive attitude towards myself.				



In each group of six words below underline the word which means the same as the word in heavy type above the group, as it has been done in the first example:

Mill Hill Synonym Scale (Form B)

- Raven (1965)

Begun.....

1. **MALARIA**

basement fever
theatre fruit
ocean tune

2. **FASCINATED**

ill-treated modelled
poisoned charmed
frightened copied

3. **LIBERTY**

freedom worry
rich serviette
forest cheerful

4. **STUBBORN**

steady hopeful
obstinate hollow
orderly slack

5. **PRECISE**

atural exact
iulty grand
stupid small

6. **RESEMBLANCE**

memory fondness
assemble repose
attendance likeness

7. **ANONYMOUS**

applicable magnificent
insulting fictitious
nameless untrue

8. **ELEVATE**

raise move
revolve work
waver disperse

9. **SCHOONER**

building man
scholar singer
plant ship

10. **COURTEOUS**

dreadful proud
polite short
curtsey truthful

11. **PROSPER**

imagine propose
succeed beseech
punish trespass

12. **LAVISH**

unaccountable selfish
romantic lawful
extravagant praise

13. **IMMERSE**

frequent hug
reverse dip
rise show

14. **CONCILIATE**

congregate reverse
pacify radiate
compress strengthen

ENVISAGE

ceble	contemplate
round	estrangle
ivate	regress

AMULET

neo	jacket
rtation	crest
arm	savoury

GARRULOUS

lkative	daring
ssive	ugly
diculous	fast

LIBERTINE

offligate	rescuer
rrago	canard
icide	missionary

BOMBASTIC

ocratic	anxious
ckering	cautious
structive	pompous

LEVITY

arsimony	frivolity
utary	velleity
acuity	tariff

WHIM

nplain	noise
nic	fancy
ad	rush

RUSE

b	paste
ck	burn
our	rude

23. RECUMBENT

fugitive	cumbersome
unwieldy	repelling
penitent	reclining

24. QUERULOUS

astrigent	fearful
petulant	curious
inquiring	spurious

25. TEMERITY

impermanence	rashness
nervousness	stability
punctuality	submissiveness

26. FECUND

esculent	optative
profound	prolific
sublime	salic

27. ABNEGATE

contradict	decry
renounce	execute
belic	assemble

28. TRADUCE

challenge	attenuate
suspend	establish
misrepresent	conclude

29. VAGARY

vagabond	caprice
obscurity	vulgarity
evasion	fallacy

30. SPECIOUS

fallacious	coeval
palatial	typical
nutritious	flexible

SEDULOUS

obellious	dilatory
complaisant	diligent
ductive	credulous

NEGATORY

inimitable	adamant
blime	contrary
humismatic	trifling

33. ADUMBRATE

foreshadow	protect
detect	eradicate
elaborate	approach

34. MINATORY

implacable	diminutive
belittling	quiescent
depository	threatening

Ended.....

Appendix 3 cont. Hunger Scales

Hunger Scales

From Channon S., Hemsley D., and de Silver P (1988)

Name.....

Date.....

1)How hungry do you feel now?

not at all hungry 1 2 3 4 5 6 7 very hungry

2)Name a favourite food

How much of this food do you feel you could eat now?

None 1 2 3 4 5 6 Alot

3)Time since last meal

4)Time until next meal

Appendix 4-Experimental Word Categories

Word Types

Neutral Body Words

MOUTH
EAR
TOENAILS
WRISTS
THROAT
SHOULDERS
KNUCKLES
CHIN
JAW
FOREARM
THUMB
BROW
FOREHEAD
NECK
ANKLES
KNEE
FINGER
ELBOWS
SHIN
FRECKLES
EYELID
RIB
TEETH
SKIN

Negative Weight/Shape

HEAVY
FLESHY
BULGING
MASSIVE
DUMPY
PLUMP
PUDGY
BULKY
OBESE
FLABBY
CHUBBY
BLUBBER

Positive Weight/Shape

THIN
TONED
DAINTY
TAUT
SLIM
TRIM
LEGGY
SLENDER
SLEEK
LITHE
PETITE
WILLOWY

Positive Emotional

HAPPY
CAREFREE
EXCITED
ECSTATIC
CONTENTED
CHEERFUL
EXUBERANT
MERRY
THRILLED
SATISFIED
ENTHUSIASTIC
WONDERFUL

Negative Emotional

SAD
HOPELESS
ANGRY
WORRIED
ANXIOUS
TENSE
PESSIMISTIC
GLOOMY
MISERABLE
WORTHLESS
HELPLESS
USELESS

Appendix 4 cont.

Neutral Nouns

CANAL
HOTEL
ORCHARD
JOURNEY
MEADOW
TUTOR
COLLEGE
TRAFFIC
HALL
LUGGAGE
LANE
CRUISE
HARBOUR
SUNSET
HOLIDAY
GIFT
PAINTING
KITTEN
FLOWER
JEWELLERY
PRIEST
VILLA
MOVIE
SHAMPOO

Non-Fat Food

SALAD
HERB
VEGETABLE
FRUIT
COFFEE
CELERY
LETTUCE
CARROT
APPLE
TOMATO
CABBAGE
MELON

Fat Food

CAKES
CHIP
SWEETS
CREAM
LARD
FRIED
CHOCOLATE
CALORIES
DOUGHNUT
BISCUITS
SUGAR
POTATO

Practice Words

HOUSE
CAR
DOG
MUSIC
PARTY
BOOK

Appendix 5- Percentage of Raters who assigned each word to each category

WORD CATEGORIES

<u>WORD</u>	<u>BODY</u>	<u>WEIGHT/ SHAPE</u>	<u>FOOD</u>	<u>EMOTIONAL</u>	<u>OTHER</u>
CANAL					100%
SALAD			100%		
USELESS				93%	7%
HEAVY	7%	71%			22%
NECK	93%				7%
ENTHUSIASTIC				93%	7%
SKIN	93%				7%
HAPPY				100%	
THIN		100%			
CAKES			100%		
TUTOR					100%
FLESHY	15%	78%			7%
GLOOMY				100%	
ORCHARD			7%		93%
CARROT			100%		
PUDGY	14%	86%			
CHIN	100%				
CONTENTED				100%	
FLABBY	14%	86%			
PETTITE	28%	72%			
FRIED			100%		
WORTHLESS				100%	
CALORIES			86%		14%

<u>WORD</u>	<u>BODY</u>	<u>WEIGHT/ SHAPE</u>	<u>FOOD</u>	<u>EMOTIONAL</u>	<u>OTHER</u>
BROW	86%		7%		7%
HALL					100%
MERRY				100%	
SLEEK	16%	77%			7%
COFFEE			93%		7%
ANXIOUS				100%	
ELBOWS	100%				
MEADOW					100%
TAUT	7%	70%		7%	16%
SWEETS			100%		
CHEERFUL				100%	
CELERY			100%		
BLUBBER	14%	65%		14%	7%
THRILLED				100%	
SHIN	100%				
OBESE		100%			
FRUIT			100%		
LARD		7%	93%		
HOTEL					100%
HOPELESS				93%	7%
CHUBBY		100%			
SATISFIED				93%	7%
CABBAGE			100%		
THUMB	100%				
LITHE	14%	63%			23%
COLLEGE					100%

<u>WORD</u>	<u>BODY</u>	<u>WEIGHT/ SHAPE</u>	<u>FOOD</u>	<u>EMOTIONAL</u>	<u>OTHER</u>
FRECKLES	93%				7%
ANGRY				93%	7%
JAW	100%				
SUGAR			100%		
ANKLES	100%				
MOVIE					100%
TENSE	7%			93%	
SLENDER	7%	93%			
ECSTATIC				93%	7%
MOUTH	100%				
BULGING		77%			23%
THROAT	100%				
HERB			86%		14%
PAINTING					100%
LETTUCE			100%		
FINGER	100%				
SHAMPOO					100%
SAD				100%	
TRAFFIC					100%
PEARSHAPED	37%	56%			7%
APPLE			100%		
KITTEN					100%
RIB	93%		7%		
DAINTY		79%			21%
GIFT					100%
HARBOUR				7%	93%

<u>WORD</u>	<u>BODY</u>	<u>WEIGHT/ SHAPE</u>	<u>FOOD</u>	<u>EMOTIONAL</u>	<u>OTHER</u>
SHOULDERS	100%				
LUGGAGE					100%
SLIGHT		44%		56%	
CHIP			93%		7%
LANE					100%
KNEE	100%				
WILLOWY	7%	70%			23%
HOLIDAY				7%	93%
DUMPY		100%			
DOUGHNUT			100%		
SUNSET					100%
JOURNEY					100%
FOREHEAD	100%				
TRIM	7%	86%			7%
CRUISE					100%
FLOWER					100%
TOMATO			100%		
JEWELLERY					100%
BULKY		79%			21%
EYELID	100%				
PESSIMISTIC				100%	
CHOCOLATE			100%		
PRIEST					100%
MELON			100%		
CAREFREE				100%	
PLUMP		100%			

<u>WORD</u>	<u>BODY</u>	<u>WEIGHT/ SHAPE</u>	<u>FOOD</u>	<u>EMOTIONAL</u>	<u>OTHER</u>
WRISTS	93%	7%			
EXCITED				100%	
VILLA					100%
KNUCKLES	100%				
ELBOWS	100%				
VEGETABLE			100%		
SLIM	7%	93%			
EAR	100%				
BISCUITS			100%		
TEETH	93%				7%
TONED	14%	70%			16%
WORRIED				100%	
POTATO			100%		
WONDERFUL				100%	
FOREARM	100%				
EXUBERANT				100%	
MISERABLE				100%	
CREAM			86%		14%
TOENAILS	93%				7%
HELPLESS				100%	

Appendix 5 cont.- Percentage of Raters who rated each word as positive, neutral or negative

Ratings of Valence

WORD	POSITIVE	NEUTRAL	NEGATIVE
CANAL		93%	7%
USELESS		7%	93%
HEAVY		7%	93%
NECK		100%	
ENTHUSIASTIC	93%	7%	
SKIN		93%	7%
HAPPY	100%		
THIN	72%	21%	7%
TUTOR	14%	79%	7%
FLESHY		37%	63%
GLOOMY			100%
ORCHARD	37%	63%	
PUDGY		7%	93%
CHIN		100%	
CONTENTED	100%		
FLABBY			100%
PETITE	70%	30%	
WORTHLESS			100%
BROW		100%	
HALL		100%	
MERRY	100%		
SLEEK	86%	14%	
ANXIOUS		7%	93%
ELBOWS		93%	7%
MEADOW	44%	56%	
TAUT	63%	37%	
CHEERFUL	100%		
BLUBBER			100%
THRILLED	100%		
SHIN	7%	93%	
OBESE			100%

WORD	POSITIVE	NEUTRAL	NEGATIVE
HOTEL	7%	93%	
HOPELESS			100%
CHUBBY		7%	93%
SATISFIED	93%	7%	
THUMB		100%	
LITHE	69%	31%	
COLLEGE	23%	70%	7%
FRECKLES	21%	63%	16%
ANGRY	7%	16%	77%
JAW		93%	
ANKLES	7%	93%	
MOVIE	44%	56%	
TENSE			100%
SLENDER	86%	14%	
ECSTATIC	100%		
MOUTH	7%	93%	
BULGING		7%	93%
THROAT		100%	
PAINTING	57%	43%	
FINGER		100%	
SHAMPOO	14%	86%	
SAD			100%
TRAFFIC		56%	44%
PEARSHAPED		56%	44%
KITTEN	35%	35%	30%
RIB	7%	86%	7%
DAINTY	63%	37%	
GIFT	56%	44%	
HARBOUR		86%	14%
SHOULDERS		93%	7%
LUGGAGE	7%	93%	
SLIGHT	21%	44%	35%
LANE	14%	86%	
KNEE		100%	
WILLOWY	63%	37%	
HOLIDAY	70%	30%	

WORD	POSITIVE	NEUTRAL	NEGATIVE
DUMPY			100%
SUNSET	70%	30%	
JOURNEY	37%	63%	
FOREHEAD		100%	
TRIM	86%	14%	
CRUISE	65%	35%	
FLOWER	70%	30%	
JEWELLERY	70%	30%	
BULKY		14%	86%
EYELID		92%	8%
PESSIMISTIC			100%
PRIEST	14%	86%	
CAREFREE	93%	7%	
PLUMP		14%	86%
WRISTS	7%	93%	
EXCITED	100%		
VILLA	37%	63%	
KNUCKLES		93%	7%
ELBOWS		93%	7%
SLIM	100%		
EAR		100%	
TEETH	30%	70%	
TONED	93%	7%	
WORRIED			100%
WONDERFUL	100%		
FOREARM		100%	
EXUBERANT	93%	7%	
MISERABLE			100%
TOENAILS		93%	7%
HELPLESS			100%

Appendix 5 cont.- Percentage of raters who rated food words as fat, neutral or thin.

Ratings of Valence

CANAL	FAT	NEUTRAL	THIN
SALAD			100%
CAKES	100%		
CARROT		15%	85%
FRIED	100%		
CALORIES	69%	31%	
COFFEE		54%	46%
SWEETS	100%		
CELERY			100%
FRUIT		37%	63%
LARD	100%		
CABBAGE		31%	69%
SUGAR	92%	8%	
HERB		44%	56%
LETTUCE			100%
APPLE		24%	76%
CHIP	100%		
DOUGHNUT	100%		
TOMATO		31%	69%
CHOCOLATE	92%	8%	
MELON		38%	62%
VEGETABLE		46%	54%
BISCUITS	100%		
POTATO	56%	44%	
CREAM	100%		

Appendix 6-Analyses of Word Frequency and Syllables

Table 1: Results of Kruskal-Wallis analysis of word frequency for all categories of words.

Chi-Square	D.F.	Significance
11.5250	7	.1172

Table 2: Results of Kruskal-Wallis analysis of number of syllables for all categories of words.

Chi-Square	D.F.	Significance
21.3021	7	.0004

As the Kruskal-Wallis analysis of number of syllables was significant, further Wilcoxon analyses of target word categories was carried out.

Table 3: Results of Wilcoxon rank sum test of number of syllables of target word categories.

Word Categories	Significance
Negative weight/shape vs Positive weight/shape	.09
Nonfat food vs fat food	.2670
Neutral Body vs all weight/shape words	.2260
Negative Emotional vs Positive Emotional	.1062



Northamptonshire Health
Authority

Our Ref: JB/DPB/96/86

Tel: Chairman (01604) 235488
Secretary (01604) 615229

15th November 1996

Department of Clinical Psychology Training
Isis Education Centre
Wameford Hospital
Wameford Lane
HEADINGTON
Oxford. OX3 7JX

Dear

RE: 96/86 AN INVESTIGATION INTO SELECTIVE MEMORY BIAS IN THE PROCESSING OF
EATING, WEIGHT AND SHAPE RELATED WORDS IN WOMEN WITH BULIMIA NERVOSA,
DEPRESSION AND FEMALE NON-CLINICAL CONTROLS

I am pleased to inform you that Formal Ethical Approval has been granted by the Committee for this study to proceed.

In relation to the anticipated results of the study, members requested further detail regarding the therapeutic aspect, and perhaps you would clarify this particular point. Concern was also expressed regarding the badly written letter to participants of the trial and perhaps an amended copy could be made available to the Committee in due course. These comments do not alter the consent for proceeding with the study.

To complete our records regarding your project, I would be grateful if you could complete and return the form accompanying this letter.

Please let me know if the study has to be terminated or any ethical considerations arise which need to be discussed further by the Committee.

Yours sincerely,


Jonathan Bibby
Chairman, Northampton Medical Research
/Ethics Committee

Enc.

**Oxford
Radcliffe**

**OXFORDSHIRE PSYCHIATRIC RESEARCH
ETHICS COMMITTEE**

THE OXFORD RADCLIFFE
Manor House
Headley Way, Headington
Oxford OX3 9DZ

Tel: 01865 222692/222547
Fax: 01865 222699

Our Ref: DG/ps/96/55

4th February 1997

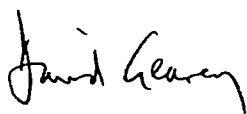
Clinical Psychologist in Training
Isis Education Centre
Warneford Hospital

Dear .

RE: OPREC: 96/55 - An investigation into selective memory bias in the processing of eating, weight and shape related words in women with bulimia nervosa, depression and female non-clinical controls

Thank you for your letter of the 10th January 1997. The study now has full ethics approval.

Yours sincerely,



Dr David Geaney, Consultant Psychiatrist
Chairman, Oxfordshire Psychiatric Research Ethics Committee

Chairman: Dr David Geaney

Aylesbury Vale Local Research Ethics Committee

Mandeville Road, Aylesbury
Buckinghamshire HP21 8AL
Telephone (01296) 315000
Direct Line: (01296) 316784
Fax: (01296) 316789

9 January 1997

Dept. Clinical Psychology Training
Isis Education Centre
Warneford Hospital
Warneford Lane
Headington
Oxford OX3 7JX

Dear

Re: Project NC721 - An investigation into selective memory bias
in the processing of eating, weight and shape
related words in women with bulimia nervosa,
depression and female non-clinical controls.


I refer to your application to the Local Research Ethics Committee
for consideration of the above project. I am pleased to inform you
that the Committee approves the project on ethical grounds on the
understanding that:

- i Any ethical problem, arising in the course of the
project, will be reported to the Committee.
- ii Any change in the protocol will be reported to the
Committee.
- iii A brief report will be submitted after completion.

Ethical approval by the Committee is not an authority to proceed.
You are advised to discuss your proposal with all heads of
departments and others who might be affected, particularly if there
are financial and/or staffing implications.

Please note that your research may be subject to review annually by
the Committee.

Yours sincerely



R M HIDL

Secretary to Local Research Ethics Committee

OXFORD REGIONAL TRAINING COURSE IN CLINICAL PSYCHOLOGY
Doctorate in Clinical Psychology

COURSE DIRECTOR:
Mrs. Jane Dunn, M.Phil., C.Psychol

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Oxford (01865) 226374 Course Secretary
Fax: Oxford (01865) 226364

An Investigation into Bulimia Nervosa

Participant Consent Form

Responsible Investigator-

(Please circle your answer)

Have you read the information sheet?	YES\NO
Have you had an opportunity to ask questions and discuss this study?	YES\NO
Have you received satisfactory answers to all your questions?	YES\NO
Have you received enough information about the study?	YES\NO

Who has explained the study to you?

Do you understand you are free to leave the study

-at any time

-without having to give a reason for leaving

- and without affecting your future medical care YES\NO

Do you agree to take part in this study? YES\NO

Signature

Date

Name (in block letters)

Appendix 9 DSM-IV Structured Clinical Interview-Bulimia Nervosa

BULIMIA NERVOSA

BULIMIA NERVOSA CRITERIA

IF: CRITERIA CURRENTLY MET FOR ANOREXIA NERVOSA, CHECK HERE AND SKIP TO THE NEXT MODULE.

SCREEN Q#12	
YES	NO

IF NO: GO TO NEXT MODULE

-> IF SCREENING QUESTION #12 IS ANSWERED "NO," SKIP TO NEXT MODULE.

-> IF QUESTION #12 ANSWERED "YES":
You've said that you've often had times when your eating was out of control. Tell me about those times.

-> IF SCREENER NOT USED: Have you often had times when your eating was out of control? Tell me about those times.

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by BOTH of the following:

(2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating) ? 1 2 3

H11

GO TO NEXT MODULE

IF UNCLEAR: During these times, do you often eat within any two hour period what most people would regard as an unusual amount of food? Tell me about that.

(1) eating, in a discrete period of time (e.g., within any two hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.

H12

GO TO NEXT MODULE

Did you do anything to counteract the effects of eating that much? (Like making yourself vomit, taking laxatives, enemas, water pills, strict dieting or fasting, or exercising a lot?)

B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as: self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.

H13

GO TO *BINGE EATING DISOR- DER,* H. 7
--

How often were you eating that much (AND COMPENSATORY BEHAVIOR)? (At least twice a week for at least three months?)

C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.

H14

GO TO *BINGE EATING DISOR- DER,* H. 7
--

Were your body shape and weight among the most important things that affected how you felt about yourself?

D. Self-evaluation is unduly influenced by body shape and weight.

2 1 2 3 H15

GO TO
NEXT
MODULE

E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

? 1 2 3 H16

GO TO
NEXT
MODULE

BULIMIA NERVOSA CRITERIA
A, B, C, D AND E ARE CODED
"3"

1 3 H17

GO TO
NEXT
MODULE

BU-
LIMIA
NER-
VOSA

SPECIFY TYPE:
During the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas

1 3

NON-PURG-
ING TYPE

PURG-
ING
TYPE

A. MOOD EPISODES

IN THIS SECTION, MAJOR DEPRESSIVE, MANIC, HYPOMANIC EPISODES, DYSTHYMIC DISORDER, MOOD DISORDER DUE TO A GENERAL MEDICAL CONDITION, SUBSTANCE-INDUCED MOOD DISORDER, AND EPISODE SPECIFIERS ARE EVALUATED. MAJOR DEPRESSIVE DISORDER AND BIPOLAR DISORDERS ARE DIAGNOSED IN MODULE D.

CURRENT MAJOR DEPRESSIVE EPISODE

MDE CRITERIA

Now I am going to ask you some more questions about your mood.

A. Five (or more) of the following symptoms have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood, or (2) loss of interest or pleasure.

in the last month...

(1) depressed mood most of the day, nearly every day, as indicated either by subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: in children and adolescents can be irritable mood.

? 1 2 3

A1

...has there been a period of time when you were feeling depressed or down most of the day nearly every day? What was that like?

	\\	/	

IF YES: How long did it last? (As long as two weeks?)

...what about losing interest or pleasure in things you usually enjoyed?

(2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated either by subjective account or observation made by others).

? 1 2 3

A2

IF YES: Was it nearly every day? How long did it last? (As long as two weeks?)

IF NEITHER ITEM (1) NOR ITEM (2) IS CODED "3," GO TO *PAST MAJOR DEPRESSIVE EPISODE,* A. 12
--

NOTE: WHEN RATING THE FOLLOWING ITEMS, CODE "1" IF CLEARLY DUE TO A GENERAL MEDICAL CONDITION, OR TO MOOD-INCONGRUENT DELUSIONS OR HALLUCINATIONS

Appendix 9 cont. SCID Depression

FOR THE FOLLOWING QUESTIONS, FOCUS ON THE WORST TWO WEEKS IN THE PAST MONTH (OR ELSE THE PAST TWO WEEKS IF EQUALLY DEPRESSED FOR ENTIRE MONTH)

During this (TWO-WEEK PERIOD)...

..did you lose or gain any weight? (How much?) (Were you trying to lose weight?)

(3) significant weight loss when not dieting, or weight gain (e.g., a change of more than 5% of body weight in a month) or decrease or increase in appetite nearly every day. Note: in children, consider failure to make expected weight gains.

? 1 2 3

A3

IF NO: How was your appetite? (What about compared to your usual appetite?) (Did you have to force yourself to eat?) (Eat [less/more] than usual?) (Was that nearly every day?)

Check if:

- weight loss or decreased appetite
- weight gain or increased appetite

A4

A5

..how were you sleeping? (Trouble falling asleep, waking frequently, trouble staying asleep, waking too early, OR sleeping too much? How many hours a night compared to usual? Was that nearly every night?)

(4) insomnia or hypersomnia nearly every day

? 1 2 3

A6

Check if:

- insomnia
- hypersomnia

A7

A8

..were you so fidgety or restless that you were unable to sit still? (Was it so bad that other people noticed it? What did they notice? Was that nearly every day?)

(5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)

? 1 2 3

A9

IF NO: What about the opposite -- talking or moving more slowly than is normal for you? (Was it so bad that other people noticed it? What did they notice? Was that nearly every day?)

NOTE: ALSO CONSIDER BEHAVIOR DURING THE INTERVIEW

Check if:

- psychomotor retardation
- psychomotor agitation

A10

A11

..what was your energy like? (Tired all the time? Nearly every day?)

(6) fatigue or loss of energy nearly every day

? 1 2 3

A12

Appendix 9 cont. SCID Depression

During this time...

..how did you feel about yourself? (Worthless?) (Nearly every day?)

(7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)

? 1 2 3

A13

IF NO: What about feeling guilty about things you had done or not done? (Nearly every day?)

NOTE: CODE "1" OR "2" IF ONLY LOW SELF-ESTEEM

Check if:

- worthlessness
- inappropriate guilt

A14
A15

..did you have trouble thinking or concentrating? (What kinds of things did it interfere with?) (Nearly every day?)

(8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)

? 1 2 3

A16

IF NO: Was it hard to make decisions about everyday things? (Nearly every day?)

Check if:

- diminished ability to think
- indecisiveness

A17
A18

..were things so bad that you were thinking a lot about death or that you would be better off dead? What about thinking of hurting yourself?

(9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

? 1 2 3

A19

IF YES: Did you do anything to hurt yourself?

NOTE: CODE "1" FOR SELF-MUTILATION W/O SUICIDAL INTENT

Check if:

- thoughts of own death
- suicidal ideation
- specific plan
- suicide attempt

A20
A21
A22
A23

AT LEAST FIVE OF THE ABOVE SXs [A (1-9)] ARE CODED "3" AND AT LEAST ONE OF THESE IS ITEM (1) OR (2)

1 3

A24

GO TO
*PAST
MAJOR
DEPRES-
SIVE
EPI-
SODE,*
A. 12

Appendix 9 cont. SCID Depression

IF UNCLEAR: Has (DEPRESSIVE EPISODE/OWN WORDS) made it hard for you to do your work, take care of things at home, or get along with other people?

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

? 1 2 3

A25

GO TO *PAST MAJOR DEPRESSIVE EPISODE,* A. 12

Just before this began, were you physically ill?

C. Not due to the direct physiological effects of a substance (e.g., a drug of abuse, medication) or to a general medical condition

? 1 3

A26

IF YES: What did the doctor say?

DUE TO SUBSTANCE USE OR GMC. GO TO *PAST MAJOR DEPRESSIVE EPISODE* A. 12

Just before this began, were you using any medications?

IF GENERAL MEDICAL CONDITION OR SUBSTANCE MAY BE ETIOLOGICALLY ASSOCIATED WITH DEPRESSION, GO TO *GMC/SUBSTANCE* A. 43. AND RETURN HERE TO MAKE RATING OF "1" OR "3."

IF YES: Any change in the amount you were using?

PRIMARY MOOD EPISODE

Just before this began, were you drinking or using any street drugs?

Etiological general medical conditions include: degenerative neurological illnesses (e.g., Parkinson's disease), cerebrovascular disease (e.g., stroke), metabolic conditions (e.g., Vitamin B-12 deficiency), endocrine conditions (e.g., hyper- and hypothyroidism, hyper- and hypoadrenocorticism); viral or other infections (e.g., hepatitis, mononucleosis, HIV), and certain cancers (e.g., carcinoma of the pancreas).

Etiological substances include: alcohol, amphetamines, cocaine, hallucinogens, inhalants, opioids, phencyclidine, sedatives, hypnotics, anxiolytics. Medications include antihypertensives, oral contraceptives, corticosteroids, anabolic steroids, anticancer agents, analgesics, anticholinergics, cardiac medications.

CONTINUE BELOW

Appendix 9 SCID Depression

Did this begin soon after someone close to you died?

D. Not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

1	3
SIMPLE BEREAVE- MENT	NOT SIM- PLE BEREAVE- MENT
GO TO *PAST MAJOR DEPRES- SIVE EPISODE* A. 12	CONTINUE BELOW

A27

MAJOR DEPRESSIVE EPISODE CRITERIA A, B, C AND D ARE CODED "3"

1	3
GO TO *PAST MAJOR DEPRES- SIVE EPI- SODE,* A. 12	CUR- RENT MAJOR DE- PRES- SIVE EPI- SODE

A28

How many separate times in your life have you been (depressed/IN WORDS) nearly every day for at least two weeks and had several of the symptoms that you described, like (SXS OF WORST EPISODE)?

Total number of Major Depressive Episodes, including current (CODE 99 IF TOO NUMEROUS OR INDISTINCT TO COUNT)

— —

A29

NOTE: TO RECORD DETAILS OF PAST EPISODES, GO TO J. 9 (OPTIONAL).

Appendix 9 cont. Screening interview for non-clinical participants

EATING QUESTIONNAIRE

Instructions: This questionnaire has questions about dieting and eating habits as well as questions about weight and shape. Please read each question carefully before giving your answer. Where the answer is a YES/NO choice please circle the response that best applies to you.

Section A:

Age:

Weight:

Height:

Section B:

Have you been trying to lose weight in the past four weeks? (it does not matter whether you have been successful or not) YES/NO If NO please go to Section C.

How have you tried to lose weight?

Setting a definite calorie limit YES/NO

Strict limits on quantity of food eaten YES/NO

Strict rules about what can be eaten YES/NO

Following a standard reducing diet YES/NO

Having diet drinks instead of meals YES/NO

Other YES/NO (If YES please give details)

On how many days in the past four weeks have you tried to lose weight using one or more of these methods?

If answer is 28 days go to Section C.

Appendix 9 cont. Screening Interview for non-clinical participants.

If you have had a break from trying to diet in these ways in the last four weeks, how many days did the longest break last?

Section C:

Have you ever had a time when you weighed much less than other people thought you ought to weigh? YES/NO If NO go to Section D

How much did you weigh?

How old were you?

How tall were you?

At that time, were you very afraid that you could become fat? YES/NO

At your lowest weight did you still feel too fat or that part of your body was too fat? YES/NO

Did your weight or shape affect how you felt about yourself - more than for most women your age? YES/NO

Did your periods stop for three months or longer? YES/NO

Were you taking a contraceptive pill? YES/NO

Section D:

Have you ever had one or more eating binges during which you ate a lot of food in a short period of time - more than most people would eat in a similar period of time in similar circumstances? YES/NO If NO go to Section E.

During these binges, did you feel that your eating was out of control? YES/NO

Did you ever eat 1000 calories or more during a binge?

YES/NO

Appendix 9 cont. Screening Interview for non-clinical
Participants

Did you typically eat 1000 calories or more during a
binge? YES/NO

Did these binges ever happen twice a week or more (on
average) for at least three months? YES/NO If YES, did
this go on for at least three months with at least one
binge every two weeks? YES/NO

Did you do any of the following to counteract the effects
of the binges?

Vomit/make yourself sick YES/NO

Take laxatives YES/NO

Take diuretics YES/NO

Go on a strict diet YES/NO

Fast YES/NO

Exercise a lot YES/NO

Did your weight or shape affect how you felt about
yourself - more than for most women your age? YES/NO

Section E:

Have you ever done any of the following to lose weight or
prevent yourself from gaining weight? (even if only on
one occasion)

vomited/made yourself sick YES/NO

tried to vomit/make yourself sick but not succeeded

YES/NO

taken laxatives YES/NO

taken diuretics YES/NO

Appendix 9 cont. Screening interview for non-clinical
Participants.

Section F:

Have you ever had treatment or help for a psychological
or psychiatric problem? YES/NO If YES, please give
brief details of problem and help received

Appendix 10. Descriptive Data for Self Report Measures

Table 1: Range of Scores for each Questionnaire for the Bulimic Group (N=12)

Questionnaire	Minimum Score	Maximum Score
BDI	12	37
EAT	12	45
EDBQ-A	23.6	94.6
EDBQ-C	38.00	98.00
EDBQ-NS	36.00	100.00
EDBQ-SA	63.3	100.00
RSE	12	26
Mill Hill	19	34

Table 2: Range of Scores for each Questionnaire for the Female Control Group (N=18)

Questionnaire	Minimum Score	Maximum Score
BDI	0	12.00
EAT	0	7
EDBQ-A	0	31.8
EDBQ-C	0	14.00
EDBQ-NS	0	66.00
EDBQ-SA	0	81.70
RSE	21	38
Mill Hill	26	40

Appendix 10. cont.

Table 3: Range of Scores for each Questionnaire for the Depressed Control Group (N=12)

Questionnaire	Minimum Score	Maximum Score
BDI	10.00	50.00
EAT	1	16
EDBQ-A	0	59.00
EDBQ-C	0	56.00
EDBQ-NS	4	90.90
EDBQ-SA	10.00	81.70
RSE	12	26
Mill Hill	18	37

BDI= Beck Depression Inventory; EAT= Eating Attitudes Test; RSE=Rosenberg Self Esteem Scale, this has been scored in a positive direction such that a higher score indicates higher self esteem; Mill Hill= Mill Hill Vocabulary Scale, Synonym Section; EDBQ-A= Eating Disorders Belief Questionnaire-Acceptance by others Scale; EDBQ-C= Control Scale; EDBQ-NS= Negative Self Beliefs Scale; EDBQ-SA= Self Acceptance Scale.

Appendix 11. Results of Correlation Analyses

Pearson Correlation of Mill Hill scores with total number of words recalled

	Total words	Significance
Mill Hill	.403	p < .008

Table 1: Pearson Correlation of Mill Hill scores with number of words recalled for each category.

Word Type	Correlation with Mill Hill	Significance
Negative Emotion	.359	p < .05
Positive Emotion	.384	p < .05
Negative Weight/shape	.136	NS
Positive Weight/shape	.297	NS
Non fat food	.238	NS
Fat food	.255	NS
Weight/ shape	.259	NS
Body	.418	p < .01
Emotion	.412	p < .01
Neutral Nouns	.276	NS
Food	.270	NS

Appendix 11 cont.

Table 2: Spearman Rho correlation of Hunger scale data and recall of food words for all participants

Variable	Correlation with recall of food words	Significance
Hunger	.431	$p < .01$
Time	.023	$p > .05$
Amount	.231	$p > .05$

Table 3: Spearman Rho correlation of Hunger scale data and recall of food words for the bulimic group

Variable	Correlation with recall of food words	Significance
Hunger	.682	$p < .01$
Amount	.571	$p > .05$

Table 4: Spearman Rho correlation of Hunger scale data and recall of food words for the female control group

Variable	Correlation with recall of food words	Significance
Hunger	.172	$p > .05$
Amount	-.012	$p > .05$

Appendix 11 cont.

Table 5: Spearman Rho correlation of Hunger scale data and recall of food words for the depressed group

Variable	Correlation with recall of food words	Significance
Hunger	.643	$p < .05$
Amount	.254	$p > .05$

Wood, S.E. (unpublished paper, 1996). *Classification Of Speech Sound Errors Identified Through Auditory-Based Analysis*.

Ziegler, W. (1984). What Can the Spectral Characteristics of Stop Consonants Tell Us about the Realization of Place of Articulation in Broca's Aphasia? A Reply to Shinn and Blumstein. *Brain And Language*. 23, p.167-170.

Ziegler, W. and Hoole, P. (1989). A combined acoustic and perceptual analysis of the tense-lax opposition in aphasic vowel production. *Aphasiology*. 3, p.449-463.

Ziegler, W. and von Cramon, D. (1985). Anticipatory coarticulation in a patient with apraxia of speech. *Brain And Language*. 26, p.117-130.

Ziegler, W. and von Cramon, D. (1986a). Disturbed coarticulation in apraxia of speech: Acoustic evidence. *Brain and Language*. 29, p.34-47.

Ziegler, W. and von Cramon, D. (1986b). Timing deficits in apraxia of speech. *European Archives Of Psychiatry And Neurological Sciences*. 236, p.44-49.