An experimental test of a schema based model of eating disorders.

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An experimental test of a schema-based model of eating disorders

A new schema-based model of eating disorders proposes that differences in the way emotional material is processed might explain the radical behavioural differences seen between anorexic and bulimic pathology. Within this model, anorexic pathology appears to involve a *primary avoidance of affect,* where cognitive avoidance of ego-threats is used to avoid triggering negative emotions. The process is schema-driven, with higher levels of negative schema resulting in a higher level of cognitive avoidance. In bulimic pathology, a *secondary avoidance of affect* occurs, where the individual uses bingeing to reduce awareness of intolerable emotions once triggered. This study measured cognitive avoidance using a modified visual dot probe task in 36 eating disordered women and 12 non clinical participants.

As predicted by the model, women with an anorexic profile showed cognitive avoidance of emotional threat. There were also some correlations between negative schema and avoidance in anorexic cases, although these findings are preliminarily only. Further work is required to establish whether cognitive avoidance of threat is the first step in a primary avoidance of affect. Clinical and research implications are discussed.

An experimental test of a schema-based model of eating disorders

CHAPTER ONE

INTRODUCTION

Cognitive behavioural models of eating disorders have traditionally focused on thinking and behaviours relating to shape, size and weight. However, treatments based on challenging cognitions at this level have been more successful for bulimia than anorexia[1], with current research providing only equivocal support for CBT in the latter (Leung, Waller & Thomas, 1999a). Even in the treatment of bulimia nervosa, CBT only leads to remission rates of 40 to 50% (Agras, Walsh, Fairburn, Wilson & Kraemer 2000), suggesting a deficit in our understanding of the disorder.

In line with a general theoretical shift toward understanding deeper levels of cognition (Hollon & Beck, 1994), recent models of eating disorders have suggested a central role for maladaptive schemas and schema processes (Cooper, 1997). Negative schemas are experienced as unconditional, a priori truths about oneself in relation to the environment, developed and expanded on since childhood (Beck, 1967). Studies of women with eating disorders point to the importance of negative maladaptive schemas. However, there is little evidence for a systematic difference in cognitive content across anorexic and bulimic pathology.

Young (1999) has proposed a number of mechanisms (schema processes) by which individuals elaborate or attempt to 'avoid' their maladaptive schemas. Differences in the way these beliefs are processed have been proposed as a way of explaining the radical behavioural differences seen (Waller, under consideration). Within this model, restriction involves a *primary avoidance of affect,* initially mediated through a cognitive avoidance of ego-threats. In bulimia, a *secondary avoidance of affect* occurs, whereby the individual uses bingeing to reduce their awareness of intolerable emotions once triggered. The current study aims to investigate the role of cognitive avoidance of ego-threats in anorexic eating pathology.

The Introduction will outline the current knowledge base within the eating disorders field, and discuss recent developments in cognitive theory. Finally, this chapter will describe how experimental paradigms can be used to further our understanding of anorexia and bulimia, leading to the aims and hypotheses of the current study.

[1] For brevity, 'anorexia' will be used to refer to diagnoses relating to anorexic pathology and 'bulimia' to denote diagnoses relating to bulimic pathology. The full terms will be used for specific sub-diagnoses as appropriate.

1.1 Eating Disorders

1.1.1 Introduction to the Eating Disorders

Most eating disorders are characterised by an overwhelming obsession with the control of weight and shape, resulting in restricted, chaotic or irregular eating styles. Individuals with eating disorders typically use their weight, shape and eating as primary indices of their self-worth, and the pursuit of thinness becomes the main focus for maintaining a sense of control over their lives.

Eating behaviours are often used as a means of emotional regulation in patients with eating problems. In some disorders, such Binge Eating Disorder, this mechanism is central, and concerns about weight and shape are either secondary or absent.

Historically, anorexic disorders were identified in the late nineteenth century, defined by the presence of severe and inexplicable emaciation and amenorrhoea (Gull, 1874; cited in Russell, 1995). The category of bulimia nervosa was identified in the late 1970s (Russell, 1979), and a number of further categories (e.g., binge eating disorder) have been identified more recently.

1.1.2 Anorexia Nervosa

In anorexia nervosa, individuals achieve a very low weight primarily through a severe restriction of food intake, often combined with excessive exercise. The disorder is classified within axis I of DSM-IV (American Psychiatric Association, 1994), and is diagnosed using the following criteria:

- Refusal to maintain body weight at or above a minimally normal weight for age and height. This is defined as a body weight of less than 85% expected, or a failure to gain weight during a period of weight gain, again leading to a body weight of less than 85% of that expected
- An intense fear of becoming fat or gaining weight, even though underweight.
- A disturbed perception of body image and weight.
- In post-menarchal women, amenorrhoea will be present.

Two sub-types exist: a binge eating/purging subtype and a restrictive subtype. The former involves regular self-induced bingeing and/or vomiting, use of laxatives or other purging behaviour. In the restrictive subtype, these behaviours are absent.

1.1.2.1 Prevalence

Prevalence rates are difficult to establish in anorexia nervosa, due to the fact that many cases do not seek help. However, recent reviews suggest rates of 0.7% in teenage girls (Hoek, 1993). There is a common view that rates of anorexia are rising. However, higher rates of referral to psychiatric

services may be the result of increased help-seeking, better detection and changes in diagnostic practice (Lucas, Beard, O'Fallon, Kurtland,1991, as cited in Fairburn & Harrison, 2003). Prevalence rates are higher in white, western, female adolescents, with men constituting only 10% of cases (Lucas, Crowson, O'Fallon, Melton, 1999). Unlike most mental health problems, the disorder may be more common in higher socio-economic groups (Fairburn & Harrison, 2003).

1.1.2.2 Risk factors

In common with other mental health problems, early experiences of adverse parenting, parental discord and child abuse are associated with increased risk for anorexia. Risk factors more specific to anorexia include: low parental contact; high parental expectations; a family history of eating disorders; family dieting; and critical comments about eating, shape or weight (Connors, 1996; Fairburn, Cooper, Doll and Welch 1999). Pre-morbid psychological characteristics include low self-esteem, perfectionism and anxiety. Twin studies indicate concordance rates for anorexia nervosa of around 55% in monozygotic twins and about 5% in dizygotic twins, suggesting significant heritability for the disorder (Treasure & Holland, 1989).

1.1.2.3 Course of the disorder

Anorexia starts typically with dietary restriction in adolescence, and in many cases is brief and self-limiting. However, for 10-20% of this group, the disorder becomes entrenched, with individuals often developing binge

eating and about half becoming bulimic (Sullivan, Bulik, Fear & Pickering, 1998; Steinhausen, 2000).

1.1.2.4 Treatment outcome

Outcome for anorexia is poor. There are currently no properly empirically validated treatments for adults, although family-oriented treatment is more effective among younger cases (Fairburn & Harrison, 2003). Only modest treatment effects have been identified for cognitive behavioural therapy, cognitive analytic therapy and psychodynamic psychotherapy (Fairburn & Harrison, 2003). The disorder is associated with a relatively high mortality rate (Nielsen, 2001), with most deaths resulting from medical complications or suicide (Nielsen, Moller-Madsen & Isager 1998).

1.1.2.5 Associated physical health problems

A range of physical health problems are associated with anorexia nervosa. These are thought to be secondary to disturbed eating and poor nutritional state (Fairburn & Harrison, 2003). Anorexia has an adverse effect on endocrine, cardiovascular, gastrointestinal and haematological functioning. Medical complications include oedema, severe electrolyte disturbance, cardiac arrhythmias, hypoglycaemia, and osteoporosis (Pomeroy, Mitchell, Roerig & Crow, 2002; Sharp & Freeman, 1993). Patients who vomit or use laxatives may experience renal and metabolic complications due to dehydration (Goldbloom & Kennedy, 1995).

1.1.2.6 Co-morbid psychological problems

Co-morbid anxiety and depression are common in anorexia (Braun, Sunday & Halmi, 1994), with particularly high rates of obsessive-compulsive disorder, social phobia, panic disorder and generalised anxiety. There is some controversy about the prevalence of co-morbid personality disorder, with different studies identifying rates between 23-80% (Halmi, 1995). The highest rates are seen in the purging subtype.

1.1.2.7 Pre-morbid personality

The pre-morbid personality of anorexics is often described as being perfectionist, self-critical, insecure, shy and compliant (Vitousek & Manke, 1994). They feel driven to compensate for any perceived failure, and may experience a brief feeling of elation when they are successful. There is a strong drive to manage uncertainty through self-improvement, resulting in a 'New Year's Resolution' cognitive style (Vitousek and Hollon, 1990), such as 'I must do X, so Y will come to pass and I shall be a better person for my efforts'.

1.1.2.8 Summary

Anorexia is defined by an over-valuing of weight and shape, resulting in a pattern of behaviours that result in radical, often life-threatening, weight loss. Demographic risk factors for the disorder include being female, adolescent, white and from a western culture. High parental expectations, low parental contact and parental discord have also been implicated. Genetic risk factors are likely to play a role, although the mechanism for this is unclear. Anorexia is associated with serious health complications

and with co-morbid anxiety and depression. Treatment outcome for the disorder is poor, and there is currently no properly empirically validated treatment for adults. Perfectionism and low self-esteem are characteristic psychological traits, with patients showing a strong drive toward perceived self-improvement.

1.1.3 Bulimia Nervosa

In bulimia nervosa, attempts to restrict food intake are interrupted by repeated binges, in which an unusually large amount of food is consumed. This combination of restriction and bingeing usually results in a normal, or above normal, body weight.

The disorder may be diagnosed if the following are features are present (DSM-IV, American Psychiatric Association, 1994):

- Recurrent episodes of binge eating (more than two episodes per week) associated with a lack of control of eating behaviour during the binges.
- Recurrent inappropriate behaviours (including self-induced vomiting, fasting, and use of laxatives or diuretics and excessive exercise) are used to compensate for loss of control and bingeing.
- Persistent preoccupation with shape and weight, and self-evaluation is linked to shape and weight.
- Diagnosis is excluded if the behaviours occur exclusively during episodes of anorexia.

Two subtypes can be distinguished depending on the presence or absence of purging behaviour. In the purging sub-type, individuals regularly vomit or use laxatives after binge eating. In the non-purging sub-

type individuals do not vomit, but instead diet and/or exercise to compensate for bingeing.

1.1.3.1 Prevalence

Recent reviews suggest rates of 1-2% in young women aged 16 to 35 (Hoek, 1993). As with anorexia, bulimia is more common in white women from western societies. However, the peak age of onset is generally older, and there is an even distribution across social classes (Fairburn & Harrison, 2003).

1.1.3.2 Risk factors

Risk factors for bulimia are similar to those for anorexia. These include: a family history of an eating disorder; depression; adverse parenting; sexual abuse; family dieting; critical comments about weight and shape; and occupational pressure to be slim. Pre-morbid low self-esteem, perfectionism and anxiety are also implicated as risk factors for both disorders. Specific to bulimia, however, is a family history of substance misuse (especially alcoholism), childhood and parental obesity, and early menarche. In contrast to anorexia, there is little evidence for strong heritability of bulimia, with twin studies yielding concordance rates of 35% in monozygotic and 30% in dizygotic twins (Treasure & Holland, 1989).

1.1.3.3 Course of the disorder

The onset of bulimia is slightly later than anorexia, with about a quarter of cases having previously met criteria for anorexia (Mitchell, Hatsukami, Eckert & Pyle,1985). In most cases, bulimia begins with dietary restriction,

which is then interrupted by binge eating, and a concomitant gain in weight (Fairburn, Cooper, Doll, Norman & O' Connor, 2000). The disorder is chronic and self-perpetuating, with an average five-year history at presentation for treatment (Mitchell et al., 1985). A third to a half of individuals will still have an eating disorder five to ten years after their initial presentation (Collings & King, 1994).

1.1.3.4 Treatment outcome

Despite the chronic course of the disorder if it is untreated, bulimia is responsive to a number of different interventions. Current research indicates a moderately beneficial effect for cognitive behavioural therapy and some beneficial effect for antidepressants, dialectical behaviour therapy, exposure with response prevention and interpersonal psychotherapy (Fairburn & Harrison, 2003). No consistent predictors of outcome have been identified.

1.1.3.5 Associated physical health problems.

In general, the physical abnormalities seen in most cases of bulimia nervosa are minor (Fairburn & Harrison, 2003), although vomiting often results enlarged parotid glands and some dental enamel erosion (Mitchell, 1995). In some cases, frequent vomiting and laxative abuse are associated with renal and metabolic complications due to dehydration and electrolyte disturbance (Goldbloom & Kennedy, 1995). In particularly extreme cases of purging behaviour, lowered potassium levels may result in heart attack, stroke or an epileptic fit (Mitchell, 1995).

1.1.3.6 Co-morbid psychological problems.

As for anorexia, co-morbid anxiety and depression are common in bulimia (Braun et al. 1994). Significantly higher levels of drug and alcohol misuse are seen in bulimia compared to anorexia (Holderness, Brooks-Gunn & Warren, 1994), although this group may be over-represented in specialist treatment centres (Welch & Fairburn, 1996). Personality disorders are also common in severe cases of bulimia, with inpatient studies showing two thirds of patients meeting criteria for either cluster B (dramatic) or C (anxious) personality disorder (Braun et al. 1994).

1.1.3.7 Pre-morbid personality

In common with patients with anorexia, individuals with bulimia often suffer from low self-esteem and perfectionism. However, compared to the consistent drive for self-improvement and self-control seen in anorexics, individuals with bulimia alternate between restraint and disinhibition. Their response to perceived failure is often impulsive, resulting in bingeing and other maladaptive behaviours (Vitousek & Manke, 1994).

1.1.3.8 Summary

In common with anorexia, bulimia is characterised by an overwhelming obsession with the control of eating, weight and shape. However, dietary restriction and other behaviours aimed at weight loss are interrupted by binge eating, resulting in normal, or above normal, weight. Prevalence is

higher than for anorexia, but its distribution is similar, predominately affecting white women from western societies. Risk factors are similar to those for anorexia, with roles for adverse parenting, familial mental health problems, and an early emphasis on the importance of weight and shape. Additional factors specific to bulimia include childhood or family obesity, early menarche, and family drug and alcohol abuse. The evidence for significant heritability of bulimia nervosa is weak.

Bulimia typically starts with a period of restriction before binge eating is seen. Untreated, the disorder is chronic and self-perpetuating. A number of interventions have been shown to be effective, with current evidence supporting cognitive behavioural treatments most strongly.

1.1.4 Atypical Eating Disorders

Most cases of atypical eating problems of clinical severity can be categorised into Binge Eating Disorder, Atypical Anorexia Nervosa or Atypical Bulimia Nervosa.

1.1.4.1 Binge Eating Disorder

Binge Eating Disorder (BED) is defined by recurrent episodes of binge eating in the absence of extreme weight-control behaviours (DSM-IV, American Psychiatric Association, 1994). Bingeing often occurs in the context of generalised over-eating and there is strong association with obesity (Dingemans, Bruna & Furth, 2002).

The overwhelming obsession with weight and shape seen in anorexia and bulimia is often absent in BED, and bingeing is primarily seen as a way of regulating emotion (Heatherton & Baumeister, 1991). In terms of distribution, patients typically present in their 40's and as many as a quarter are male (Barry, Grilo & Masheb, 2002). Little is known about the aetiological and maintenance factors for the disorder. There is a high rate of spontaneous remission (as reviewed in Fairburn & Harrison 2003), and BED also responds well to a variety of pharmacological and psychological treatments, including: cognitive behaviour therapy; interpersonal psychotherapy (Wilfley, Welch & Stein, 2002) and behavioural weight loss programmes (Stunkard, 2002). However, the reduction in bingeing achieved within treatment does not usually result in large weight loss in these individuals (Fairburn & Harrison, 2003).

1.1.4.2 Atypical Anorexia and Bulimia Nervosa

Most cases in these categories closely resemble full syndrome anorexia and bulimia respectively (Turner & Bryant-Waugh, 2001), but do not meet full diagnostic criteria (Andersen, Bowers & Watson, 2001). However, little is known about how their distribution, aetiology and maintenance factors differ from those of the two prototypical disorders (Fairburn & Harrison, 2003). Recent research has suggested they may make up as many as half of community-based cases (Millar, 1998; Turner & Bryant-Waugh, 2001), and there is considerable migration of cases between diagnoses (Fairburn & Harrison, 2003).

1.1.6 Psychological Models of Eating Disorders

The following section outlines the major theoretical approaches (psychodynamic, systemic, and cognitive-behavioural) to understanding eating disorders.

1.1.6.1 Psychodynamic Models

There are three main psychodynamic models of eating disorders: the drive-conflict model; the object-relations model; and the self-psychological perspective. All three models emphasise the role of unconscious defence mechanisms in eating-disordered behaviour. There is currently a dearth of research testing the efficacy of psychodynamic psychotherapy, with a recent review reporting few treatment trials, none of which were of high quality (Fairburn & Harrison, 2003).

1.1.6.1.1 The drive-conflict model

The first psychoanalytic attempts to understand eating disorders were based on Freud's drive-conflict model, in which pathology was thought to arise from internal conflict between the three agencies of mind: the id, ego and superego. Symptoms represented conflict between the sexual and/or aggressive aims of the id and the defences mounted against these aims by the ego and superego. Early theorists saw self-starvation as a defence against guilt, which was elicited by sexual fantasies of oral impregnation (Waller, Kaufman & Deutsch, 1940) or sadistic oral fantasies (Masserman, 1941). Treatment focused on the resolution of these intra-psychic conflicts through interpretation and the development of insight.

1.1.6.1.2 The Object-Relations model

Object-relations models postulate that individuals internalise self-other representations on the basis of their early experiences. Selvini-Palazzoli (1978) proposed that early problems in interactions between mother and child could result in the anorexic forming an internal representation of their mother as essentially 'bad' and over-controlling. This maternal introject is then equated with the anorexic's body, and starvation is used to try and minimise the confused, ambivalent identification with her mother.

Other theorists have suggested that there might be a number of conflicting object relations for the anorexic (Masterson, 1978), including representations that are both hostile and rewarding. Internal representations that are rejecting and withdrawing cause the anorexic to attempt complete emotional separation from others. However, in response to more supportive and rewarding introjections, the anorexic may swing into regressive, clinging behaviour.

In their consideration of bulimia, Sugarman & Kurash (1982) argue that these patients lack the ego function of object constancy. Thus, when separated from significant others (either emotionally or physically), they are unable to soothe themselves with a mental representation of their closeness to the person. Since eating in infancy is associated with a close bonding between mother and child (the primary object relation), bingeing becomes a means of evoking this smoothing. Sugarman (1991) expands on this idea, suggesting that bulimic women fail to develop the ability to

communicate their needs, wishes and feelings verbally, and that they unconsciously use their bodies as a vehicle to communicate their unmet needs.

1.1.6.1.3 Theories of Self Psychology

Self psychologists propose that early failures in the provision of mirroring and idealising interactions lead to deficits in the individual's ability to maintain their self-esteem, to develop a cohesive sense of the self, and to regulate emotions (Goodsitt, 1997). In the context of a western emphasis on physical attractiveness, these deficits are later expressed in the woman's attempt to gain a sense of control and self-worth through her weight and shape (Sands, 1989).

The failure to provide an appropriate affirming self-object may occur when parents are themselves self-absorbed, anxious, needy, overwhelmed or depressed. The child might decide that reliance on others is effectively 'too risky', and a façade of pseudo-self-sufficiency might be adopted (Modell, 1978). Indeed, interpreting herself as the cause of her parents' problems, she may commit herself to never being a burden on others, devoting herself to the care of others, and functioning as a reassuring figure for them whilst negating her own needs. The absence of reliable internal self-regulation results in the anorexic feeling inadequate, ineffective and out of control – expressed as feeling fat.

The aetiology of bulimia is conceptualised as more conflicted, with the

child attempting to meet both her own psychological needs and those of her parents - a task that is experienced as impossible and overwhelming (Goodsitt, 1997). As the tension from this conflict mounts during puberty, she seeks to escape through impulsive behaviours, such as bingeing.

1.1.6.2 Systemic & family models

Models of family therapy emphasise the importance of dysfunctional family roles, alliances and conflict avoidance in eating disorders (e.g., Minuchin, Rosman & Baker 1978). Treatment is aimed at changing unhelpful interactions between family members, mobilising other family 'resources' to tackle the problem. Treatments based on family therapy have been shown to be effective for adolescents with anorexia (Fairburn & Harrison, 2003)

1.1.6.2.1 Structural models

Minuchin and co-workers (1978) have proposed that anorexia might develop in families where there is an interaction between a child's psychological vulnerability and specific interpersonal problems within the family (such as enmeshment, rigidity and over-protectiveness). This interaction results in the anorexic playing the role of a 'sick child', allowing the family to avoid open conflict. Treatment is aimed at 'correcting' the dysfunctional roles by limiting some patterns of interactions and encouraging others (Sargent, Liebman & Silver, 1985). Improvement within the family (for example, learning to identify and resolve day-to-day conflict) is believed to diminish the 'need' for the symptoms of the eating

disorder.

1.1.6.2.2 Milan and post-Milan systems therapy

In the original 'Milan' formulations, the patient's family was seen as a rigidly organised system, in which the symptoms of the illness played a powerful homeostatic role (Selvini-Palazzoli, Boscolo, Checchin & Prata, 1978). The Milan therapists developed a set of interviewing techniques that elicit detailed information about the family system, revealing the interconnectedness of different aspects of family life and thereby introducing a new perspective. The therapist develops hypotheses about the function of disordered eating behaviours within the organisation of the family. Those hypotheses are generally fed back to the family in the form of an end-of-session 'message', often both emphasising positive aspects of the status quo and including the prescription of a task that challenges the perceived system.

Post-Milan systems therapy argues for a neutral stance on the part of the therapist, as direct pressure on the family (viewed as a homeostatic system) is likely to be met by a counter-pressure to maintain the system in an unchanged, balanced state. Instead of making direct interventions, the therapist interviews the family to gain a joint understanding of how the problem varies under different family conditions - encouraging family members to become observers of their own interactional patterns. This generates new information, which the family can use to challenge previously rigid beliefs about themselves and their relationships.

1.1.6.3 Behavioural models

Slade (1982) conceptualised anorexia nervosa as a learned behaviour that occurs in the context of a number of necessary setting conditions - namely, a general dissatisfaction with life, a low level of self-acceptance, and perfectionist tendencies. These setting conditions predispose the individual toward self- and bodily control, and dieting is then triggered by a variety of psychosocial processes (such as peer pressure to be slim and stressful life events). Restriction is positively reinforced by a sense of success and being in control, and negatively reinforced through the avoidance of other problems. In essence, the model explains why weight loss is pursued beyond social norms of physical attractiveness, as the anorexic seeks to achieve personal control and success in one area of life, in the context of general dissatisfaction and perfectionism. Following on from a period of restriction, bulimia is viewed as a response to the prevailing environmental and biological pressures to increase food intake.

There is correlational support for the model, especially in the high levels of perfectionism seen in anorexics (Halmi, Goldberg, Ekert, Kasper & Davis, 1977) and in the relationship between the onset of the disorder and stressful life events (Dally & Gomez, 1979). The model is limited, however, by its failure to take account of the role of cognitions in eating disorders. Nor does it elaborate on the powerful maintenance effects of preoccupation with weight and shape.

1.1.6.4 Early cognitive behavioural models

In the early 1980's, Garner and Bemis began to apply the principles of Beck's cognitive behavioural theory (Beck, Rush, Shaw and Emery, 1979) to understanding anorexia. They proposed that the core behavioural symptoms of the disorder were a direct result of a set of beliefs, attitudes, and assumptions about the meaning of body weight and shape (Garner & Bemis, 1985). In essence, the patient comes to believe it is absolutely essential to be thin - a belief that drives eating-disordered behaviour and forms the basis of a broader system of self-evaluation.

Within the model, rigid dietary control is maintained by both positive and negative cognitive self-reinforcement. Restrictive pathology conforms to an avoidance paradigm, as negative reinforcement prevents disconfirmation of their dysfunctional beliefs about the consequences of exposure to a feared stimuli. They are effectively prevented from learning that weight gain will not lead to catastrophic consequences (e.g., complete loss of control, self esteem).

As with other avoidance behaviour (Beck, 1964; 1967), a 'hyperactive' belief system operates. All incoming information is shaped to fit those existing beliefs or is disregarded. In anorexia, Garner and Bemis stress the fact that it is impossible for the individual to create distance between herself and the feared stimulus, since it is herself at a higher weight. Unlike other disorders, the anxiety created by the feared stimulus (weight

gain) is often valued, since it assists in maintaining the self-restraint necessary to restrict intake of food. Positive reinforcement of dietary restraint is provided through a sense of gratification at successful weight loss, which is maintained by feelings of mastery, self-control and competence.

1.1.6.5 Recent developments in cognitive behavioural models

Fairburn, Shafran & Cooper (1999) have put forward a new model of anorexia nervosa, which integrates the main tenets of Slade's model (1982) with the work of Garner & Bemis (1982, 1985). Restriction is conceptualised as operating through three main feedback mechanisms, concerned with control, the effects of starvation, and preoccupation with weight and shape.

Within the first pathway, dietary restriction is positively reinforced through the individual experiencing a sense of enhanced personal control and personal effectiveness with weight loss. The second mechanism describes how the effects of starvation (particularly a heightened sense of fullness, impaired concentration and intense hunger) all act to threaten the anorexic's sense of control, and further activate the control pathway. The third mechanism describes how the individual's sense of self-worth becomes narrowly defined in terms of their weight and shape, thus positively reinforcing restrictive behaviours. This final mechanism may be exclusive to modern western cultures, as concerns about weight and shape are a relatively recent feature of anorexia (Russell, 1995) and are

absent in many cases from non-western cultures (Palmer, 1993).

In Fairburn's account of bulimia nervosa (Fairburn, Marcus & Wilson, 1993), individuals are also thought to have a high need for control and to evaluate their self-worth in terms of weight and shape, resulting in extreme dieting rules. However, due to their dichotomous style of thinking, inevitable minor deviations in their planned diet are seen as a sign of complete weakness, and the bulimic may temporarily abandon all controls over eating (resulting in binge-eating). This contrasts with restrictive anorexics, who effectively 'compensate' for a minor deviation by intensifying dieting or exercising.

Vomiting, laxatives and excessive exercise are used to compensate for the effects of bingeing, and are negatively reinforced through a reduction in anxiety about potential weight gain. Bingeing and purging also cause distress and lower self-esteem, thereby increasing the individual's desire to gain control. This desire results in further dietary restriction and, ultimately, a new cycle of rule violation and bingeing.

Fairburn, Cooper and Shafran (2003) have developed a 'transdiagnostic' model of eating disorders, which concentrates on core maintenance processes across diagnostic categories. Four additional maintaining mechanisms (clinical perfectionism, core low self-esteem, mood intolerance, interpersonal difficulties) have also been proposed as important. As yet, no full treatment trials have been reported that

demonstrate whether the new models proposed by Fairburn and co-workers have additional therapeutic value over and above existing CBT models.

1.1.5.6 Effectiveness of existing cognitive behavioural models

The effectiveness of cognitive-behaviour therapy (CBT) for bulimia nervosa is well established, and recent studies also demonstrate good efficacy for binge eating disorder (Agras et al., 2000; Fairburn et al., 1995; Fairburn & Harrison, 2003; Vitousek, 1996; Wilson, 1999). Effectiveness refers here to outcomes achieved in routine clinical practice, and efficacy to outcomes achieved under more tightly controlled, manualised treatment. In bulimia, individual CBT produces an overall level of symptom reduction of 60-70% (Vitousek, 1996; Wilson, 1997), inducing remission in 40-50% of cases. Symptom reduction is only slightly lower when the treatment is delivered in a group format (Leung et al., 2000), and there is also evidence that some bulimics derive substantial benefit from self-help manuals. In controlled treatment trials for bulimia, CBT has been established to be superior to most other psychological or pharmacological therapies, either in the magnitude or immediacy of effect (Fairburn & Harrison, 2003). The effects of CBT are maintained at five-year follow-up (Fairburn, Norman, Welch, O'Connor, Doll & Peveler, 1995).

However, despite these relatively impressive results for CBT, between 50-60% of bulimics do not undergo full remission, suggesting a deficit in our understanding of the disorder and/or poor operationalisation of the model.

The evidence base for CBT for anorexia nervosa and most atypical eating disorders is relatively limited (Fairburn & Harrison, 2003; Waller & Kennerley, 2003). Published outcome trials are few, suggesting only a slight beneficial effect of CBT for adult anorexics, and showing that it is no more or less effective than other forms of psychotherapy (Fairburn & Harrison, 2003). However, an initial small scale study of cognitive therapy (including schema-level interventions) has shown promising results, with 70% of patients no longer meeting diagnostic criteria at six month follow-up (Serfaty, Turkington, Heap, Ledsham & Jolley, 1999).

1.1.5.7 Implications for future models

The existing evidence base suggests that CBT is effective in reducing the presence of bulimic behaviours, cognitions and syndromes for a large proportion of bulimics. In contrast, along with other psychotherapies, CBT appears to have a limited effect in the treatment of anorexia nervosa and atypical eating disorders. Trials to date have tested cognitive behavioural treatments that concentrate on challenging automatic thoughts and dysfunctional assumptions about food, weight and shape.

It has been suggested that existing CBT models might need to target deeper levels of cognition (e.g., Cooper, 1997; Cooper & Fairburn, 1992; Hollon & Beck, 1994), accepting that there is a causal role for past experiences in ongoing pathology (Waller, Kennerley & Ohanian, in

press). The apparent success of schema-level interventions in the treatment of anorexia (Serfaty et al., 1999) provides initial support for this approach.

1.2.1 Cognitive Theory and Schemas

In recognising the limitations of existing cognitive behavioural models, researchers have looked to recent developments in cognitive theory to identify new ways of understanding anorexia and bulimia.

1.2.1.1 Early cognitive models

Beck's original work on cognitive therapy for depression (1964) included schema-level representations. However, subsequent work in anxiety, depression and eating disorders has demonstrated that a focus on immediately accessible thoughts and behaviours is sufficient to yield positive treatment outcomes.

Despite the initial success of this approach, a number of limitations became apparent as cognitive therapy expanded to treat more complex cases. Young (1999) outlines a number of criteria that patients need to meet for traditional cognitive or cognitive-behavioural methods to be successful. Patients need:

- ready access to their feelings and thoughts;
- specific life problems they wanted to change;
- sufficient motivation to undertake homework;
- the ability to engage in a collaborative relationship with the therapist;
- sufficient cognitive flexibility to modify thoughts and behaviours through

empirical analysis.

Young argues that patients with characterological problems do not generally meet these conditions, and are therefore resistant to traditional cognitive-behavioural methods. Recently, workers in eating disorders have noted similar obstacles to utilisation of treatment anorexia nervosa and other complex cases of eating disorder (Waller et al., in press), including:

1. A low awareness of affect;
2. The ego-syntonic nature of anorexic symptoms;
3. Subjugation and defectiveness beliefs interfering with the development of a collaborative relationship with the therapist;
4. Entrenched perfectionism and dichotomous thinking resulting in highly concrete reasoning (resistant to cognitive appraisal).

In addition, some features of the eating disorders (such as very poor self-esteem, body image disturbance, perfectionism, dissociation, multi-implusive behaviours, compulsive pathology, and personality pathology) have proved particularly resistant to existing CBT methods (Fichter, Quadflieg & Reif, 1994; Waller, 1997). It has been argued that schema-level representations underpin these problems and that, without a conceptual model to account for them, therapy is unlikely to succeed (Waller et al, in press).

1.2.1.2 Schema Theory

The term 'schema' has been used in a variety of ways. A useful generic

definition describes schemas as: 'stored bodies of knowledge, which interact with the encoding, comprehension and retrieval of new information by guiding attention, expectancies and interpretation' (Williams, Watts, MacLeod & Mathews, 1997). As such, they act as templates used to interpret the meaning and significance of new experiences.

Schema content

Young (1994) has developed the term 'Early Maladaptive Schemas' to describe extremely stable, negative, rigid and global core beliefs, which develop during childhood and which are expanded on throughout the individual's lifetime. During childhood, they are viewed as functional attempts to understand and cope with persistently aversive and dysfunctional experiences (such as emotional deprivation, abandonment and failure). As schemas become elaborated over time, however, they develop into rigid and over-generalised patterns of thinking and behaving, which do not allow for alternative views of the self, others or the world. They often become central to the person's self-concept, and operate implicitly due to their perceived irrefutability.

Particular schemas are usually activated by events that are relevant to their content (for example, the failure of a friend to make contact might activate an abandonment schema). Once triggered, such schemas will generate a high level of affect, often leading directly or indirectly to a variety of psychological problems. Due to schemas' self-perpetuating nature, Young (1994) proposes that they interfere with a person's ability to

satisfy their basic human needs (for stability and connection, autonomy, desirability, and self-expression) and with the ability to accept reasonable boundaries in relationships with others. To date, Young has identified 18 maladaptive schemas, organised in five domains: (1) disconnection and rejection, (2) impaired autonomy and performance, (3) impaired limits, (4) other-directedness and (5) overvigilance and inhibition. Although a number of different schemas might underlie an individual's thoughts, feelings and behaviour over time, they are not all active at once. Specific schemas are activated by relevant situations and experiences.

Schema processes

In the presence of an early maladaptive schema, it is hypothesised that the threat of schematic change is too disruptive to the core cognitive organisation of the self. The individual more or less unconsciously engages in a variety of cognitive and behavioural processes to maintain the validity of the schema. Young (1994) has proposed three types of 'schema process' that act to preserve existing schemas - schema maintenance, schema avoidance and schema compensation.

Schema maintenance refers to patterns of information processing and behaviour that directly reinforce a schema. Examples of schema maintenance would include exaggerating information that confirms a schema, behaving in a ways consistent with the schema, and discounting evidence inconsistent with a schema.

Schema avoidance refers to strategies aimed at avoiding triggering the schema and the related intense affect. These strategies may be automatic or volitional, and include attempts not to think about schema-related material, depersonalisation and behavioural avoidance of real-life events or of circumstances that might trigger the schema. Behavioural avoidance can have particularly self-limiting effects as individuals may disengage from work, social activities or relationships.

Finally, *schema compensation* is thought to operate when patients attempt to adopt a cognitive or behavioural style that is the opposite of an underlying early maladaptive schema. These represent functional attempts in early life to redress and cope with aversive experiences. However, extended into adulthood, the individual's compensatory methods often become extreme and rigid, ultimately resulting in an apparent confirmation of the original schema. For example, an individual with a schema relating to abandonment might overcompensate by trying to be completely independent, avoiding emotional closeness and personal disclosure. The rigid extremity of these behaviours increases the likelihood of a relationship breakdown, which (given her existing schema) would be interpreted as abandonment.

1.2.1.2.1 Evidence for schema focused cognitive therapy

As yet, there are no controlled clinical trials comparing the efficacy of schema focused cognitive therapy to that of traditional cognitive therapy (James, 2001). There is, however, evidence for the efficacy of clinic-based

schema-focused interventions in relapse prevention in anxiety and depression (e.g., Morrison, 2000; Young, Beck & Weinberger, 1993). Schema focused therapy has also been applied successfully in the treatment of personality disorders, substance abuse and chronic pain, and in patients with a history of childhood abuse or history of an eating disorder (Layden, Newman, Freeman & Morse, 1993; McGinn & Young, 1996). As mentioned before, cognitive therapy that includes schema-level interventions has been successful in the treatment of anorexia (Serfaty et al., 1999).

1.2.2 A schema based model of the eating disorders

Eating-disordered patients have more pathological core beliefs than non-clinical subjects (Cooper & Hunt, 1998; Cooper & Turner, 2000; Waller et al, 2000), scoring highly on schemas related to abandonment, emotional deprivation and defectiveness/shame. There are some specific differences between the pattern of their beliefs and those of depressed patients (Cooper & Hunt, 1998; Waller, Ohanian, Meyer & Osman, 2001). However, there are few differences between the core beliefs of patients with different eating disorders (Cooper & Hunt, 1998; Leung, Waller & Thomas, 1999). This has led researchers to look to schema processing as a way of explaining the radical behavioural differences seen in bulimic and anorexic pathology.

A number of studies have investigated the role of schema content and process in the aetiology and maintenance of eating disorders. For

example, schema appear to mediate the relationship between trauma and disordered eating (Leung, Waller & Thomas, 2000; Waller, Meyer, Ohanian, Elliott, Dickson & Sellings, 2002), and there are clear links between unhealthy family functioning and schema content/processes (Leung et al, 2000; Emanuelli, Meyer, Dennis, Snell, Waller, & Lacey, under consideration).

1.2.2.1 Bulimic pathology

In bulimic pathology, Waller (under consideration) suggests that external or internal cues (or 'ego threats' - Heatherton & Baumeister, 1991) activate unhealthy schema, related negative cognitions and negative affect. Bingeing and/or other impulsive behaviours are then used to reduce awareness of this affect in the short-term, and are thus negatively reinforced. The schema process here functions to produce secondary avoidance of affect, as blocking behaviours are used to reduce awareness of intolerable emotions or cognitions once they have been triggered.

Waller et al. (in press) provide a clinical illustration of schema content and processing in secondary avoidance of affect:

> 'Amelia believed herself to be unlovable and unattractive, and believed that others were judgmental of her appearance....When, one day, a colleague said, 'You look well', her interpretation (coloured by her belief system) was extreme: 'He thinks I look fat'. This activated her schema,

triggering a powerful 'felt sense' of ugliness, fatness and self-revulsion, resulting in a physiological reaction of nausea, a flood of adrenaline and feeling of fear. She also had an uneasy sense of déjà vu and a fleeting image of being rejected. This promoted a drive to protect herself through escape – through eating to dissociate or through exiting the situation. In an instant she experienced something powerfully awful that she could not easily put into words, but which served to confirm that she was unattractive, that others were judgmental and that her future was painful'.

Other comorbid impulsive behaviours (such as alcohol abuse, self harm and risky sexual behaviour) might also function by allowing secondary avoidance of affect. The specific 'blocking' behaviour chosen may depend on a number of factors, including parental modelling, the immediate availability of the behaviour, and its speed and duration of action.

1.2.2.2 Anorexic pathology

In anorexic pathology, it is hypothesised that there is a primary avoidance of affect in response to threat cues. This is achieved through a consistent effort to reduce awareness of negative 'hot cognitions', in order to avert the experience of negative affect. It is proposed that the individual maintains a set of compensatory schemas, consisting of beliefs and behaviours that function by diverting attention from the ego threat (and resulting negative cognitions) to a more acceptable alternative schema.

For example, when faced with the threat of rejection, an individual with anorexia might focus away from threat and concentrate on beliefs (e.g., "If I am the perfect weight, I will be acceptable") and behaviours (e.g., going to the gym) consistent with their compensatory schemas (e.g., perfectionism). In the short term, primary avoidance acts to reduce the focus on negative cognitions, thereby reinforcing activation of the compensatory schemas.

Compensatory schemas typically include beliefs and behaviours related to unrelenting standards (perfectionism), emotional inhibition, subjugation, social isolation and self-sacrifice (Young, 1999; Waller, under consideration). It is proposed that primary avoidance of affect underlies a range of compulsive problems that are often comorbid with Anorexic pathology, such as obsessive-compulsive disorder and compulsive exercise (Waller, under consideration).

1.2.2.3 Evidence for the schema based model of eating disorders

Most research to date has concentrated on schema content rather than process. Consistent with the current model, both anorexic and bulimic women show higher levels of maladaptive core beliefs than comparison women (Leung et al, 1999, Waller et al, 2000). However, there are no major differences in terms of schema content between bulimic and anorexic women (Leung et al, 2000) and they may show similar patterns of maladaptive schema as seen in other psychopathologies, such as

depression (Waller, Shah, Ohanian & Elliot, 2001).

This has led researchers to look to schema processing to explain the role of negative core beliefs in eating pathology. The majority of research in the area has used information processing paradigms to investigate specific hypotheses about the role of schema on threat appraisal and behavioural responses to threat cues.

There is substantial evidence that patients with eating disorders show an initial, orientating attentional bias towards (and rapid processing of) personal threat cues, particularly if these are related to abandonment (McManus, Waller & Chadwick, 1996; Meyer & Waller, 1999; Patton, 1992; Reiger, Schotte, Touyz, Beaumont, Griffiths & Russell, 1998; Waller & Mijatovich, 1998). This is consistent with relatively automatic processing towards personally relevant threats in which the nature of the threat is established before more strategic processing occurs (Ainsworth, Waller & Kennedy, 2001)

There is also some evidence to support continued attention towards threat in non-clinical women with more bulimic attitudes who have been shown to take longer to respond to threat words on a computer-driven task of information processing (Waller, Quinton & Watson, 1995). Further, this group are differentially sensitive to ego threats relating to their negative core beliefs (e.g., words such as 'failure' or 'stupid') compared to physical threat cues (e.g., 'hurt' and 'kill') (Waller & Meyer, 1997; Waller &

Mijatovich, 1998). This suggests some specificity in the relationship between schema and threat appraisal, as consistent with the current model.

The link between threat processing and altered patterns of eating behaviour has been made in a number of studies (eg Meyer & Waller, 2000; Waller & Mijatovich, 1998). Specifically, Patton (1992) showed that women with unhealthy eating attitudes ate more following subliminal presentation of a emotionally threatening stimulus ('Mama is leaving me' versus 'Mama is loaning me'). This finding is consistent with a secondary avoidance of affect following the presentation of an emotional threat.

The majority of the research to date has concentrated on bulimic pathology, however, with little evidence for or against a hypothesis of primary avoidance of affect in women with anorexia.

1.3 The experimental paradigm

The current model predicts that anorexic pathology will be associated with a cognitive avoidance of ego threats, as a necessary first step in preventing activation of negative schemas and intolerable affect. In contrast, bulimic pathology will be associated with an attentional bias toward threat cues, resulting in schema activation and negative affect, which the individual then attempts to reduce their awareness of by the use of blocking behaviours (such as bingeing).

The current study will test these hypotheses, using a visual target

detection task to measure attentional bias toward/away from an emotional threat cue in bulimic and anorexic pathology. It is suggested that this paradigm is the optimum one for measuring both attentional bias towards an object and cognitive avoidance of it (Yiend & Matthews, 2004).

1.3.1 Threat processing and attention

To date, no specific model of threat processing has been comprehensively tested in eating disorders. Beck & Clark (1997) have proposed a three stage model of threat processing, in which there is an initial registration of a threat stimulus (stage I), followed by a preparatory phase (stage II) and then a final stage of secondary elaboration (stage III). The model was originally developed to account for threat processing in anxiety, but has recently been applied to women with eating disorders (Ainsworth et al, 2001).

During initial registration of the threat stimulus at Stage I, the individual orientates themselves to the stimuli, processing information very rapidly, involuntarily and pre-attentively. Processing at this stage is more perceptual than conceptual, involving only a rudimentary evaluation of the valence or personal relevance of the stimulus. The function of Stage I processing is to assign attentional priority to incoming information.

Stage II involves the activation of a 'primal threat mode', in which the individual prepares to respond to the threat. Here processing is partly

automatic and partly strategic, resulting in the activation of a co-ordinated behavioural, physiological, affective and cognitive response set. Threat appraisal in stage II is both rapid and involuntary, but also involves elaboration of the nature the threat

During Stage III, schemas are activated which represent the current concerns and personal issues of the individual, relevant to the nature of the threat. The stimulus is reconsidered, as individuals evaluate the availability and effectiveness of their coping resources. Processing at this stage is thought to be slower and schema-driven.

Threats presented for a second or more are thought to allow sufficient time for controlled / strategic processing to become active (Yiend & Mathews, 2004) with shorter presentation times of under 300msec resulting in more automatic processing associated with Stage I and II.

Within the current schema-based model of eating disorders outlined above, it is predicted that during Stage I and II processing both bulimic and anorexic psychopathology will involve greater attention to threat cues (reflecting orientation and primary threat appraisal). In Stage III, it is hypothesised that the two forms of eating pathology will be associated with different cognitive patterns (and hence behavioural strategies). In anorexic cases, schema-driven primary avoidance of affect will result in anorexic cases attending *away* from threat cues (in order to reduce the risk of emotional activation). In bulimic cases, it is predicted that there will be an

attentional bias *toward* threat cues, as emotional activation is a necessary element in the chain that results in secondary avoidance of affect.

1.3.2 Target detection tasks as a measure of attentional bias

Employing techniques derived from experimental cognitive psychology, researchers have produced substantial evidence that anorexic and bulimic patients selectively attend to food, body shape and weight related stimuli (Lee & Shafran, 2004; Faunce, 2002) However, these studies have almost exclusively used the Stroop interference technique. Eynsenck (1992) has argued that the Stroop colour naming task may test selective distractibility (where performance of a task is interrupted by concurrent presentation of a task-irrelevant stimulus) rather than attentional bias (when a salient stimulus is processed preferentially over a neutral stimulus).

The visual dot probe detection task does not suffer this limitation, as it allows for preferential attention to an emotionally relevant stimuli. This task was first described by MacLeod, Mathews & Tata (1986). It involves displaying two words simultaneously, one above and one below a fixation point. The words disappear from view and a 'target' (usually a letter) then follows in the location of one or other word. MacLeod et al. (1986) found that when one of the words was threatening (e.g., death) and the other neutral (e.g., table), anxious patients were relatively faster to detect the target when it appeared in the same location as the threat word. The result was interpreted as evidence that the attention of anxious individuals was captured by the threatening word, leading to faster responses to

subsequent targets in the same location.

There have been many replications of this study, using the same or similar methods, and with a variety of clinical populations (as reviewed in Harvey, Watkins, Mansell & Shafran, 2004). In a recent review on methods for investigating attentional bias, Yiend & Mathews (2004) concluded that th results appear to be unaffected by minor variations in procedure.

Given the finding that both state and trait anxiety result in attention toward brief, unpredictable threats in the dot probe task (Harvey, Watkins, Mansell & Shafran, 2004) it was deemed important to control for anxiety in the current study.

There is a dearth of studies using this technique to investigate attentional processes in eating disorders. In one of the only published studies to date, Reiger et al. (1998) found attentional bias toward negative shape and emotion words in both anorexics and bulimics. However, this study used relatively short stimulus presentation times (500ms) and an unpredictable cue location. As such, the attentional bias seen would be likely to reflect Stage I and II processing (with both bulimics and anorexics locating and evaluating the threat cues before schema driven processing (Stage III) could take place).

There are two manipulations that could enhance the likelihood of detecting cognitive avoidance of threat:

1. Manipulation of stimulus presentation times. Current attentional bias research (Yiend & Matthews, 2004) suggests that stimulus times of 1000ms are needed to allow for the elaborated processing of threat cues commensurate with Stage III processing. Stimulus presentation times of 250ms have been shown to elicit attentional biases toward threat commensurate with Stage I and II processing (Derryberry & Reed, 2002). It is therefore possible to differentiate between early and late threat appraisal using stimulus presentation using stimulus presentation times of 250ms and 1000ms respectively.
2. Manipulation of predictability of cues. By making the position of the threat cues predictable, participants with an underlying cognitive avoidance of threat can anticipate and attend away from threat cues.

The current study will attempt to demonstrate the controlled processing of threat cues (and hence cognitive avoidance), using a longer stimulus presentation time and a predictable positioning of cues in some trials.

1.3.3 The current study

Research to date shows that schema content is similar across bulimic and anorexic disorders. In order to understand what maintains eating disorders, researchers have recently looked to schema processing (rather than content) to account for the behavioural differences between anorexia and bulimia. Waller (under consideration) has proposed that anorexic pathology involves a primary avoidance of affect through compensatory schema processing. In contrast, bulimic pathology is thought to reflect a

behavioural attempt to reduce awareness of negative affect once it has been triggered (secondary avoidance of affect). The current study investigates the hypothesis that anorexic pathology is associated with a primary avoidance of affect, manifesting as a cognitive avoidance of ego threats.

To date, researchers have produced substantial evidence that anorexic and bulimic patients selectively attend to food, body shape and weight related stimuli. However, these studies have almost exclusively used the Stroop interference technique, which is criticised for testing selective distractibility rather than attentional bias (Eysenck, 1992). Visual dot probe detection tasks do not have this limitation, as they allow for preferential attention towards or away from emotionally relevant stimuli. However, in order to allow for cognitive avoidance of threat cues to take place, this study will test the impact of longer stimulus presentation times and predictable positioning of threat cues.

1.3.4 Research aim

This study of eating-disordered and comparison women tests the hypothesis that anorexic pathology is associated with a cognitive avoidance of ego-threats, while bulimic pathology is associated with an attentional bias towards such threats.

1.3.5 Hypotheses

1. In trials with short stimulus presentation times (250ms) and unpredictable positioning of threat cues, both bulimic and anorexic profiles will be associated with an attentional bias toward threat (consistent with Stage I and II initial registration and threat elaboration).

2. In trials with a long stimulus presentation (1000ms) and/or predictable positioning of threat cues, an anorexic profile will be associated with attentional bias away from threat cues, consistent with schema driven Stage III processing (cognitive avoidance).

3. In trials with a long stimulus presentation and predictable positioning of threat cues, a bulimic profile will be associated with an attentional bias toward threat cues (i.e., a lack of Stage III avoidance).

4. In trials with a long stimulus presentation and predictable positioning of threat cues, the strength of the attentional bias/cognitive avoidance will be related to the individual's level of maladaptive schemas.

CHAPTER TWO

METHODS

2.1 Design

The study used an experimental paradigm to measure cognitive avoidance of threat, employing a modified visual dot probe detection task (MacLeod et al, 1986). There were two participant groups - a clinical group of women with restrictive and bulimic eating disorders, and a group of non-eating-disordered women. Participants were asked to complete a computerised dot probe task, and to complete a set of questionnaires assessing their level of restriction/bulimia and their schemass.

2.2 Ethics

Ethical approval for the study was obtained from the Local Research Ethics Committee (Wandsworth) at St George's Healthcare NHS Trust (Appendix 3)

2.3 Participants

Due to the low numbers of males presenting to the eating disorder service it was decided to limit the study to females only. A total of 54 women were recruited. Of these, three patients declined to take part and three clinical participants were excluded due to problems with the running the experiment. Demographics for both groups are presented in the Results section.

Non clinical comparison group

The comparison group consisted of 12 non-eating-disordered women, aged 18 years and upwards. They were drawn from a non-student population to aid demographic comparability with the clinical samples. Exclusion criteria for the control participants was the current or past presence of an eating disorder.

Clinical participants

The clinical participants were 36 consecutive referrals to a specialist eating disorder service, and current inpatients and outpatients of the same service. New referrals were assessed by experienced qualified clinicians within the service, and diagnosed using the criteria outlined in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994).

Information on diagnosis was collected to verify that the clinical group did not include participants with sub-clinical eating problems. All clinical participants had a current or recent (within three months) diagnosis of an eating disorder: 41.7% (n=15) had a current or recent diagnosis of anorexia nervosa or atypical anorexia, and 52.7% (n=19) participants had a current or recent diagnosis of bulimia nervosa or atypical bulimia. 5.6% (n=2) had a current diagnosis of EDNOS normal weight purging behaviour.

Anorexic / bulimic eating pathology within the clinical group

As discussed in the introduction, the diagnostic categories of anorexia and bulimia are limited by their inability to reflect the range of restrictive and bulimic behaviours present in individual cases. This is particularly true of atypical anorexia and bulimia, in which a mixture of restrictive and bulimic features are often present.

Unfortunately, no well validated, sensitive measure of restrictive behaviour currently exists and restriction was therefore not measured directly in the study (this limitation is considered in the discussion). To reflect different levels of bulimic behaviours, participants' Eating Disorder Inventory Bulimia Subscale scores were used as continuous measures of their eating pathology (Garner, 1991).

The bulimia subscale measures the tendency of individuals to think about and engage in episodes of binge eating and purging behaviours (Garner, 1991). However, a number of validation studies (as reviewed in Garner, Olmsted, Polivy, 1983, Garner, 1991) have demonstrated the ability of the EDI bulimia scale to distinguish between anorexic and bulimic pathology within a population of eating disordered women.

These studies have shown that individuals with a anorexic profile (primarily those with anorexia nervosa and atypical anorexia) are characterised by low scores on the bulimia subscale (mean scores of around 2). Those with a bulimic profile (individuals with bulimia nervosa of either subtype) are

characterised by high scores on the bulimia subscale (mean scores of around 11). Within a sample of women with a diagnosis of anorexia or bulimia, therefore, lower scores on the EDI bulimia subscale represent increasingly anorexic tendencies and increasing scores on the bulimia subscale represent increasingly bulimic tendencies. For brevity, low scores on the bulimia subscale in the current study will be referred to as an *'anorexic profile'* and decreasing scores on the subscale as representing an increase in *'anorexic tendencies'.* High scores on the bulimia subscale will be referred to as a *'bulimic profile'* and increasing scores on the subscale as representing an increase in *'bulimic tendencies'.*

Power analysis

The power analysis was calculated using the only comparable study by Reiger et al (1998), which analysed group differences in attentional bias in different types of eating disorder. For the current study, the power calculation was set up to detect differences between different levels of bulimia within the clinical group, and was based on the assumption that there would be a range of high, medium and low levels of bulimic cases. This suggested that 36 eating-disordered participants would be needed to achieve 80% power, with a range of levels of bulimia present in the clinical group (Dupont & Plummer, 1997).

2.4 Procedure

In response to their referral to the eating disorders service, clinical participants were initially sent an appointment letter for an assessment. This also informed them that they might be asked to take part in a research trial, but that this was optional and would not affect their treatment. Current patients were recruited via their clinician, who informed them of the study and gave them the information sheet (Appendix 1) to read. If interested in taking part, they were given the opportunity at the end of the session or at a later date at their convenience.

Clinical participants were assessed by a qualified clinician and given a DSM-IV diagnosis. Weight and height were measured objectively, in order to calculate body mass index (BMI = weight (kg)/ height $(m)^2$). After the assessment, if interested in taking part in the study, they met the researcher, who gave them an information sheet regarding the experiment (Appendix 1). After reading this and raising any queries or concerns with the researcher, participants gave informed consent (Appendix 2).

Non clinical participants were recruited from colleagues working within the eating disorder service. They were approached by the researcher and given an information sheet to read, which specified that they should not volunteer if they had a current or past history of an eating disorder (Appendix 1). If interested in taking part, they were asked to complete the Eating Disorders Inventory (EDI) to ensure that their Drive for Thinness subscale score was not indicative of an eating disturbance. After reading the information sheet

they were given the opportunity to raise any queries or concerns with the researcher. Informed consent was then given (Appendix 2).

All participants were then asked to complete the 10 minute computer task described in section 2.6. They were asked if they were aware of any pattern in the position of the words during the experiment. Finally, participants completed a questionnaire pack, which asked questions about their eating patterns, eating attitudes and their schemas.

2.5 Measures

Each participant was asked to complete the following three questionnaires, which took approximately 15 minutes to complete:

- Eating Disorders Inventory – which measures eating attitudes and behaviours (Garner, Olmsted & Polivy, 1983)
- Young Schema Questionnaire – short version (Young, 1998), which measures Early Maladaptive Schemas
- The Spielberger State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983) – which measures state and trait anxiety.

Their psychometric properties are presented below.

2.5.1 Eating Disorders Inventory (Garner, Olmsted & Polivy, 1983)

The Eating Disorders Inventory is a 64 item self report measure of eating attitudes and symptoms associated with anorexia and bulimia nervosa. The drive for thinness and bulimia subscales were of relevance to the study.

The Drive for Thinness subscale was derived from Bruch (1973, 1982) who described the 'drive for thinness' as the cardinal feature of eating disorders and Russell (1979) has described its antithesis, 'the morbid fear of fatness' as the core psychopathology of both anorexia and bulimia. The clinical manifestations of an intense drive to be thinner or fear of fatness is essential for a diagnosis of both disorders. Items on this subscale assess excessive concern with dieting, preoccupation with weight and fear of weight gain.

In normative data from a number of validation studies women with restrictive and bulimic eating disorders score similarly on the drive for thinness subscale, with their mean scores being almost three times higher than those of women without an eating disorder (Garner, Olmsted & Polivy, 1983). The subscale was used to confirm that control participants did not have attitudes or symptoms associated with an eating disorder and to confirm the presence of a core preoccupation with weight and shape in the clinical group. In previous studies (Ben-Tovim & Walker, 1991) a score of 7 or more has been used to indicate a high drive to thinness.

The Drive for Thinness subscale correlates highly (r = 0.71) with the Eating Attitudes Test (EAT- 26 Garner, Olmsted, Bohr & Polivy, 1982, Garner, 1991) and with the Restraint Scale (r = 0.61) (Herman and Polivy, 1980).

The Bulimia scale assesses the tendency to think about and engage in episodes of uncontrollable eating (bingeing) and purging behaviours. The

presence of binge eating is one of the defining features of bulimia nervosa and differentiates between bulimic and restrictor subtypes of anorexia nervosa (Garner, 1991).

The EDI bulimia subscale has been shown to correlate well with subscales of the EAT-26 relating to bulimic behaviours, lack of self control and preoccupation with food (as reported in Garner, 1991) . Henderson and Freeman (1987) have also reported that the EDI bulimia subscale had a correlation of 0.68 with another self report measure of bulimic behaviour. Improvements on the bulimia subscale following treatment were significantly correlated with reductions in binge eating ($r=0.63$, $p<0.01$) (Garner, 1991).

The EDI has been extensively validated in a number of populations. Garner (1991) reported good internal consistency, with alpha coefficients of over 0.8 for all subscales in clinical populations and over 0.7 for non-clinical populations (with the exception of the Maturity Fears subscale, which is not used in the current study). Good test-retest reliability has also been documented in three independent studies, with Pearson product moment correlation coefficients after three weeks ranging from 0.81 – 0.97 (Garner 1991).

The EDI discriminates between eating-disordered patients and non-clinical samples, and self-report ratings from the EDI correlate moderately with ratings by a trained clinician (r = 0.41-0.68). Clinical studies have also demonstrated that the EDI is sensitive to clinical changes in patients with

bulimia nervosa. Overall, factor analytic studies have consistently supported the eight factors of the EDI (Garner, 1991).

2.5.2 Young Schema Questionnaire – Short Version (YSQ-S; Young, 1998)

The YSQ-S is a 75-item questionnaire, based on the longer 205-item version (Young, 1994). Items on the original questionnaire were derived from clinical experience, to reflect beliefs associated with 16 separable schemas. Subsequent factor analytic studies supported 15 of the schemas (Schmidt, Joiner, Young & Telch, 1995; Lee, Taylor & Dunn, 1999). The YSQ-S measures these 15 factors using the five items from the original scale that loaded most strongly on each. The items are answered on a six-point Likert scale ranging from 'completely untrue of me' to 'describes me perfectly'. The 15 schemas and corresponding beliefs are:

1. abandonment (others cannot provide emotional support or protection);
2. mistrust/abuse (others will be abusive or hurtful);
3. emotional deprivation (emotional needs are not satisfied by others);
4. defectiveness/shame (the belief that one is defective or internally flawed);
5. social isolation (one is different from others and isolated from the rest of the world;
6. dependence/incompetence (one is helpless to cope with everyday tasks);
7. vulnerability to harm/illness (fear that disaster will strike at any time);

8. enmeshment (lack of own identity due to emotional over-involvement with others);
9. failure to achieve (one is fundamentally inadequate in areas of achievement);
10. entitlement (one is entitled to whatever one wants);
11. insufficient self-control (one cannot control own impulses or feelings);
12. subjugation (surrendering of control to others for fear of negative consequences);
13. self-sacrifice (sacrificing one's own needs to meet the needs of others);
14. emotional inhibition (inhibition of feelings to avoid disapproval from others); and
15. unrelenting standards (striving to meet impossible standards).

Waller, Meyer & Ohanian (2001) investigated the psychometric properties of the questionnaire in bulimic and comparison women, finding good internal reliability for each schema (alpha > 0.8) and correlations with scores on the longer version (r > 0.9). The YSQ-S also demonstrated good discriminate validity, with the use of two of the scales alone leading to correct group allocation rate of 87%. Other studies (Stopa, Thorne, Waters & Preston, 2001; Petrocelli, Glaser, Calhoun & Campbell, 2001) have demonstrated reasonable clinical validity of the YSQ-S. This measure correlates with measures of psychopathology, such as the Symptom Checklist-90-Revised (SCL-90-R, Derogatis, 1977) and the Millon Clinical Multiaxial Inventory-II; (Millon, 1987).

The YSQ-S is still a relatively new measure, and evidence regarding its reliability and validity is limited. However, there is increasing support for the measure (Schmidt et al, 1995; Lee et al., 1999), and other studies conclude that the YSQ-S can be used with reasonable confidence (Stopa et al., 2001; Waller et al., 2001).

2.5.3 State-Trait Anxiety Inventory (Spielberger, 1983)

Previous attentional probe tasks have shown that both state and trait anxiety result in attentional bias toward brief and unpredictable threats (MacLeod et al, 1986, MacLeod & Mathews, 1988). In the current study the STAI was included as a measure of anxiety, to control for the potential confounding effects of anxiety on cognitive avoidance.

State anxiety refers to the individual's emotional reaction at a given moment in time, and is characterised by subjective feelings of tension, apprehension, nervousness and worry. Trait anxiety refers to relatively stable individual differences in anxiety-proneness. In other words, it considers differences between people in the tendency to perceive stressful situations as dangerous or threatening, and differences in their tendency to respond to such situations with elevations in the intensity of their state anxiety reactions.

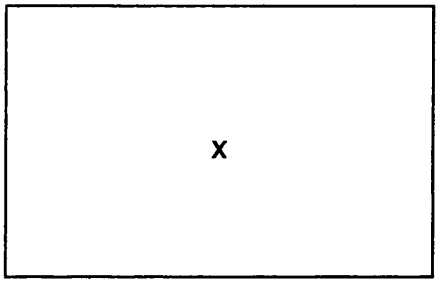
The STAI provides a valid and reliable measure of both state and trait anxiety and has been validated in a wide range of non-clinical and clinical populations (Spielberger et al, 1983) . It consists of two versions (Appendix

3), which measure state anxiety (asking about how the participant feels 'at this moment') and trait anxiety (asking about how the participant about how they feel generally). Each version has 20 items asking participants to rate how much they experience different aspects of anxiety using a four point Likert scale (ranging from 'almost never' to 'almost always').

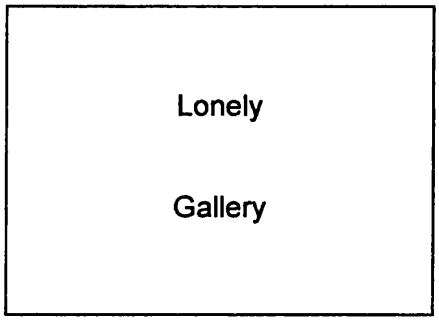
2.6 Experimental Procedure

The experiment was based in the attentional probe task first described by MacLeod et al (1986). This involves displaying words simultaneously above and below a central fixation point. The words then disappear from view and a letter 'E' or 'F' follows in the location of one or other word. Participants are asked to press the letter 'E' or 'F' on a response pad (see section on materials) as soon as they see it appear on the screen (see Appendix 5 for full protocol). Faster detection times for a letter appearing in the same location as one of the cue words are taken as evidence that the attention of the individual has been captured by the cue word. This sequence is illustrated in the diagram overleaf.

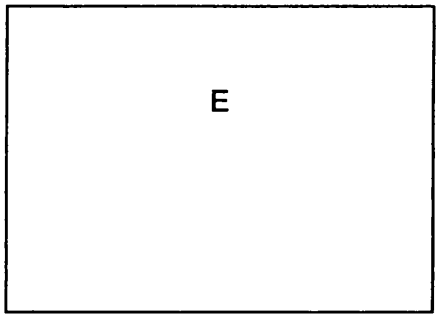
1) Fixation point



2) Cue words



3) Target



Pairs of neutral and threat words were presented on a lap top screen, using custom programmed software (Superlab, 2002). They were presented in three 'blocks'. The blocks consisted of 32 trials in each of the two predictable blocks (threat positioned in either the upper or lower half of the screen) and 64 trials in the unpredictable block. Each participant therefore completed 128 trials.

Threat and neutral words

The word 'lonely' has been shown to elicit strong effects in cognitive tasks in previous experimental studies of eating-disordered patients (Meyer & Waller, 2000, Mountford, Waller, Watson, & Scragg, 2004), and was therefore be used as the threat cue. These studies have not shown any habituation or sensitisation effects with repeated use of the stimulus word. 'Gallery' was used as the emotionally neutral word, as it is matched with the threat cue for length and frequency of use and has been used as a neutral word in similar studies in eating disorders (e.g., Meyer & Waller, 2000).

The four possible combinations of position for the letters ('E' and 'F') and words (Lonely and Gallery) were fully counter-balanced, to achieve an equal number of trials for each position in each block.

Order of predictable and unpredictable blocks of trials

The order in which predictable and unpredictable blocks of trials were presented was counter-balanced within the control and clinical groups, to control for any order effects. Equal numbers of brief and long presentation trials were ordered randomly within each block.

Following the experiment, participants were asked if they could identify any pattern in the position of the words during the first, second or third parts of the experiment. No participants reported noticing a pattern.

Duration of threat word presentation

As discussed in the Introduction, recent work on attentional processing suggests that responses to stimuli presented for 250ms represent largely automatic processing, while responses to stimuli presented for 1000ms represent more elaborated, schema-driven processing. A number of studies have shown that has show that with stimulus presentation times of a second or more, people are able to shift attention voluntarily, so that they may elect to do so in order to minimize discomfort related to aversive information (Yiend & Mathews, 2003). Therefore, presentation times of 250msec and 1000msec were used for brief and long presentations of threat.

The position of the words above or below the fixation point was chosen to achieve a 2.5 degree visual angle. This angle has been recommended to ensure that stimuli are close enough to fixation to allow some pre-attentive processing of content, but not so close that the critical reaction time differences are lost. The visual angle is a measure of the size of the object's projection on the retina. The angle depends on both viewing distance (d) and object height (h), and was calculated using the formula $\tan \alpha = h/d$, where α is the visual angle (Yiend and Matthews, 2003).

Outliers and errors

Reaction times of under 100msec were excluded on the assumption that they represented an anticipatory response. At the upper end, reaction times of over 3 (SD) from the mean for the entire data set were also excluded as

outliers (Yiend and Mathews, 2003). Errors (pressing the wrong letter) were also excluded.

Due to a problem within the experimental set-up error rate was not recorded in current study. However, outliers and errors combined typically make up less than 4% of the total dataset in this type of experiment (Yiend and Mathews, 2003). A study of a very similar design and methodology in eating disorders (Reiger et al, 1998) reported a combined outlier / error rate of less than 2%. Errors in the Reiger study (Reiger et al, 1998) were infrequent and comparable across anorexic and bulimic participants.

Calculation of cognitive avoidance

Participants' mean probe detection times were be converted to attentional bias scores (MacLeod & Mathews, 1986), computed as [(upper probe / lower target – upper probe / upper target) + (lower probe / upper target – lower probe / lower target)] / 2. This score provided an index of the degree to which probe detection was facilitated or inhibited by the target word 'lonely'.
Values were reflected in terms of the sign of the score. Negative values indicate attention toward threat, while positive values indicate attention away from threat (cognitive avoidance).

Experimental materials

The software 'Superlab 2.0 (2001)' was used to run the experiment on a standard laptop computer. A Cedrus RB420 (Superlab 2.0, 2001) response box was connected to the laptop to record participants' responses.

2.7 Data analysis

Main hypothesis: Anorexic pathology and cognitive avoidance

As discussed previously, lower levels of bulimia in the current sample represented increasingly anorexic tendencies. A repeated measures General Linear Model ANOVA was used to test the effect of anorexic tendencies on cognitive avoidance of threat. The effect of anorexic tendencies on cognitive avoidance was tested by entering participants' bulimia sub-scores as a continuous between subjects covariate (see Maxwell & Delaney, 1990). It was predicted that relatively low scores for bulimia would be associated with cognitive avoidance during controlled processing. Specifically, it was thus expected that lower bulimia score would be associated with cognitive avoidance in predictable trials and in trials where the threat word was presented at a long duration.

Covariates

In addition to the EDI bulimia scale, several additional control measures were included. The Drive for thinness scale was entered as a continuous between subject covariate to control for any potential effect of this variable on cognitive avoidance. Body Mass Index and State/Trait anxiety were also added as continuous covariates to test for their potential influence on cognitive avoidance.

The ANOVA structure is represented below:

Dependent variable

Cognitive avoidance of threat[1]

Within subject factors

Predictability of threat location (2 levels: predictable / unpredictable)

Duration of threat location (2 levels: brief 250msec / long 1000msec)

Between subject factors (covariates)

EDI Bulimia sub-scale

EDI Drive for Thinness sub-scale

Body Mass Index

State Anxiety (STAI – Y1)

Trait Anxiety (STAI – Y2)

In the clinical group, the model predicts that low levels of bulimia will be associated with cognitive avoidance of predictable and / or long threats. In the ANOVA, this association would result in significant two-way interactions between:

- Predictability x bulimia
- Duration x bulimia

Within the clinical group it was also predicted that there would be a main effect of predictability and duration, given that all clinical participants were expected to attend towards threat during brief and / or unpredictable conditions.

[1] Calculated as shown above.

No main or interaction effects were predicted in the control group.

Supplementary hypothesis: Schema and cognitive avoidance

In cases with an anorexic profile, it was predicted that there would be a correlation between the strength of their negative schemas and cognitive avoidance in predictable and/or slow presentations of threat. Women with an anorexic profile were defined by low scores on the bulimia EDI (one standard deviation below the mean for the clinical group).

In bulimic individuals, it was predicted that there would be a correlation between negative schemas and attention toward threats in all conditions. Women with a bulimic profile were defined by high scores on the bulimia EDI subscale (one standard deviation above the mean for the clinical group).

No specific correlations were predicted for the non clinical control group.

Pearson two-tailed correlation coefficients were used to test the hypotheses for the 15 negative schemas measured by the YSQ-R.

CHAPTER THREE

RESULTS

3.1 Overview

In this chapter, the data will first be inspected for normality. Second, descriptive data will be reported. Finally, the results for each of the research hypotheses will be presented in turn.

All control participants scored lower than 4 on the EDI Drive for thinness subscale. This is well below the cut-off rate of 14 suggested as indicative of eating disturbance (Garner, 1991), and suggests that this group did not suffer from any eating disorders.

3.2 Tests for normality

The data for the clinical and non clinical groups were inspected separately for normality and outliers before analysis were undertaken (Tabachnik & Fiddell, 1996). All variables were normally distributed.

One clinical participant had a z-score of over 3 in terms of their BMI. As such it represents an 'influential score' (Tabachnik & Fiddell, 1996) which might have undue influence on statistical analyses. As is recommended in such cases, it was therefore adjusted down to the next highest BMI in the clinical group in order to reduce its influence on statistical results (Aitken & West, 1991).

3.3 Descriptive data

The descriptive data for the participants' questionnaires are presented in this section.

3.3.1 Eating Disorders Inventory (Garner, Olmsted & Polivy, 1983)

Table 3.1 presents the means, range of scores and standard deviations for the three sub-scales of the Eating Disorders Inventory which are relevant to the study.

Table 3.1 Participant eating pathology

Group	Total Sample	Controls	Clinical
N	48	12	36
Mean EDI Drive for Thinness	11.67	0.58	15.36
(s.d.)	(7.54)	(0.99)	(4.47)
Range	0 – 21	0 - 3	8 –21
Mean EDI Body Dissatisfaction	18.60	7.75	22.22
(s.d.)	(10.39)	(7.07)	(8.68)
Range	0 – 32	0 - 23	6 – 32
Mean EDI Bulimia	3.50	0.33	4.56
(s.d.)	(5.10)	(0.65)	(5.05)
Range	0-21	0 - 2	0-21

State/Trait anxiety scores (STAI, Spielberger, 1983)

Participants' STAI state and trait anxiety scores are presented in table 3.2

below. The non-clinical controls were well within the normal range (Spielberger et al, 1983). The clinical participants in fact had levels of state and trait anxiety similar to those seen in samples of participants with anxiety problems (Spielberger et al, 1983, p. 13)

Table 3.2 Means and standard deviations for STAI scores

Group	Total Sample	Controls	Clinical
N	44	12	32
State Anxiety STAI –Y1	50.09	32.58	57.00
(s.d)	(15.59)	(5.90)	(11.39)
Trait Anxiety STAI – Y2	53.11	31.67	60.81
(s.d)	(15.12)	(8.68)	(8.96)

3.3.3 Young Schema Questionnaire – Short version

Table 3.3 presents the means and standard deviations for the 15 YSQ-S scales. Possible scores range from 1 to 6 for each schema, with 1-2 suggesting it is unlikely to be relevant, 3-4 suggestive of moderate importance, and 5-6 of major importance. The findings are broadly similar to those of other studies of eating-disordered populations (Leung, et al, 1999; Waller et al, 2001), with the clinical group scoring most highly on abandonment, social isolation and unrelenting standards. The non-clinical group scored in the insignificant range for all scales except self-sacrifice, the mean for which falls just within the moderate range.

Table 3.3: Means and standard deviations for YSQ-S

	Total (N=36)	Control (N=12)	Clinical (N=24)
Emotional Deprivation	2.73 (1.39)	1.50 (0.59)	3.25 (1.29)
Abandonment	3.46 (1.73)	1.45 (0.56)	4.31 (1.27)
Mistrust / Abuse	3.43 (1.60)	1.78 (0.85)	4.13 (1.30)
Social Isolation	3.45 (1.73)	1.52 (0.47)	4.30 (1.33)
Defectiveness	3.26 (1.65)	1.40 (0.34)	4.08 (1.28)
Failure	3.33 (1.62)	1.82 (0.83)	4.00 (1.42)
Dependence	3.00 (1.42)	1.70 (1.17)	3.56 (1.13)
Vulnerability to harm	2.51 (1.27)	1.42 (0.40)	2.98 (1.22)
Enmeshment	2.12 (1.20)	1.35 (0.52)	2.47 (1.26)
Subjugation	2.97 (1.45)	1.32 (0.33)	3.71 (1.10)
Self-sacrifice	3.61 (1.04)	3.10 (0.97)	3.85 (1.00)
Emotional Inhibition	2.84 (1.44)	1.63 (0.68)	3.36 (1.37)
Unrelenting Standards	3.89 (1.32)	2.75 (0.95)	4.40 (1.14)
Entitlement	2.41 (1.09)	1.93 (0.67)	2.63 (1.18)
Insufficient self-control	2.94 (1.12)	2.12 (0.71)	3.33 (1.08)

3.4 Mean reaction times in experimental task

The mean reaction times to cues are presented below, and represent the time taken for participants to respond to a letter presented 'behind' the threat or neutral word. The means are presented for descriptive purposes alone, as it was predicted that the cognitive biases associated with bulimic and anorexic pathologies would act in opposing directions.

Cognitive avoidance was calculated by the MacLeod and Mathews (1988) formula, computed as [(upper probe / lower target – upper probe / upper target) + (lower probe / upper target – lower probe / lower target)] / 2. Values were reflected in terms of the sign of the score. Negative values indicate attention toward threat, while positive values indicate attention away from threat (cognitive avoidance).

Consistent with other dot probe studies in a range of disorders, the clinical group showed greater attention toward unpredictable, brief threat cues than the control group. The control group showed no clear attention toward or away from threat cues when presented briefly (250ms) but appeared to show a low level of cognitive avoidance when threats were presented for longer (1000ms). The control group also appeared to be faster than clinical participants at responding to cues which followed unpredictable threats.

Table 3.4: Mean reaction times (ms) to cues and cognitive avoidance scores.

		Predictability of threat location			
		Unpredictable		Predictable	
		Duration of word presentation			
	Cue located behind	250ms	1000ms	250ms	1000ms
Control	Threat	576.78	601.57	615.15	621.41
(N=12)	(s.d.)	(61.06)	(71.39)	(104.18)	(105.96)
	Neutral	579.51	596.15	613.39	615.85
	(s.d.)	(64.11)	(77.52)	(115.39)	(102.49)
	Cognitive avoidance	*-2.73*	*5.42*	*1.76*	*5.56*
	(s.d.)	*(21.81)*	*(29.03)*	*(26.55)*	*(22.08)*
Clinical	Threat	612.16	620.72	613.28	624.88
(N=36)	(s.d.)	(107.30)	(105.96)	(98.43)	(106.83)
	Neutral	620.29	625.66	616.38	619.49
	(s.d.)	(113.23)	(105.88)	(110.65)	(109.65)
	Cognitive avoidance	*-8.12*	*-4.94*	*-3.10*	*5.40*
	(s.d.)	*(31.86)*	*(34.02)*	*(30.40)*	*(30.83)*

Having established the overall means for reaction times to threat in the clinical and non clinical groups, the following section tests hypotheses related to cognitive avoidance of threat.

3.5 Testing for cognitive avoidance

The main hypothesis, of cognitive avoidance in anorexic pathology, was tested using repeated measures General Linear Model ANOVA in the clinical group. For comparison, the same ANOVA was repeated in the control group. The dependent variable was cognitive avoidance of threat. The within subjects factors were predictability and duration of threat presentation and the main continuous between subject covariate was bulimia. Drive for thinness, Body Mass Index and trait and state anxiety were also added as covariates to test for any potential effect on cognitive avoidance.

The results from two ANOVAs are presented in Table 3.5 below, with the four effects predicted to be significant shown in bold type.

Table 3.5: Main and interaction effects for cognitive avoidance of threat

		F – value	
		Control	Clinical
	N	12	32
Main effects	**Predictability (Pred)**	**NS**	**6.07***
	Duration (Dur)	**NS**	**NS**
Interactions	**Pred x Bulimia**	NS	**5.19***
	Dur x Bulimia	NS	**NS**
	Pred x BMI	NS	8.90**
	Dur x BMI	NS	NS
	Pred x State Anxiety	NS	NS
	Dur x State Anxiety	NS	6.06*
	Pred x Drive for Thinness	NS	NS
	Dur x Drive for Thinness	NS	9.34**
	Pred x Trait Anxiety	NS	NS
	Dur x Trait Anxiety	NS	NS
	Pred x Drive for Thin x Bulimia	NS	NS
	Dur x Drive for Thin x Bulimia	NS	NS
	Pred x Dur x Drive for Thin x Bulimia	NS	NS

NS = Non significant

* = Significant at $p<0.05$, ** = Significant at $p<0.01$

3.5.1 Findings in the control group

The control group were included in the study to check whether patterns of attentional bias seen in the clinical group were present in non-eating-disordered participants. There were no effects in the ANOVA for control group, which is unsurprising given their low levels of attentional bias either toward or away from threat cues (Table 3.4).

3.5.2 Comparisons between the clinical and control groups.

The lack of effects seen in the control group can be contrasted with a number of significant effects in the clinical group. The simplest inference here is that the cognitive biases seen in the clinical group were not present in the control group. However, this could have been due to the smaller sample size of the control group, since the size of the clinical group meant it was better powered to detect differences in cognitive avoidance. This methodological limitation will be considered further in the Discussion.

3.5.3 Findings in the clinical group

Given the lack of any main or interaction effects in the control group, the main analysis will concentrate on findings for the clinical group.

3.5.3.1 Cognitive avoidance and predictability (clinical group)

As predicted, there was a main effect of the predictability of threat location on cognitive avoidance in this group, reflecting an overall tendency for clinical

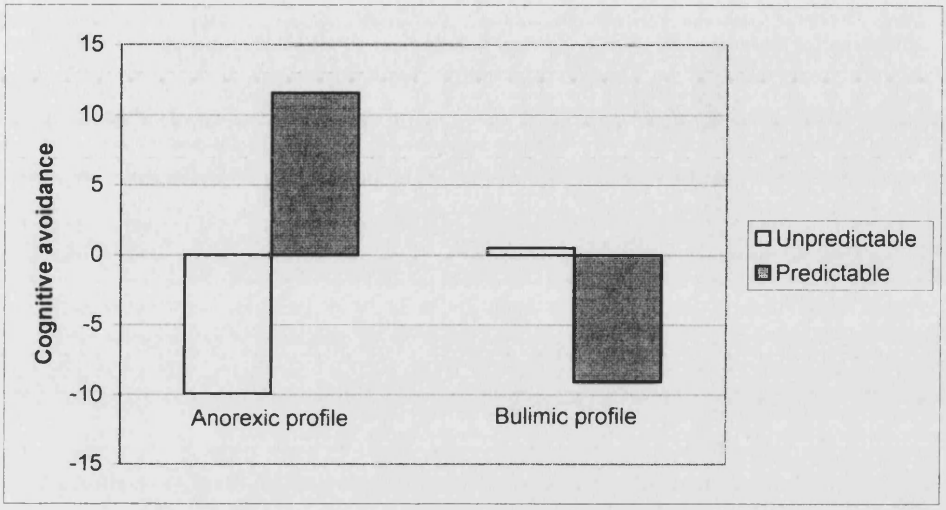
participants to attend away from threats (cognitive avoidance) when presented in a predictable location. However, contrary to predictions, there was no main effect of duration for the clinical group as a whole.

3.5.1.2 Cognitive avoidance and an anorexic profile (clinical group)

As predicted, there was an interaction between predictability and EDI bulimia scores. In other words, there was evidence that increasingly anorexic tendencies were associated with differences in levels of cognitive avoidance of threat. In order to characterise the direction of effects in this interaction, estimated means were calculated for relatively low and high points on the bulimia subscale. These were chosen as one standard deviation below (bulimia = 0) and above the mean of the EDI Bulimia scale for the clinical group (bulimia = 9.61), as described by Aiken and West (1991). A plot of these estimated means is shown below in Figure 3.1 .

Figure 3.1:

Interaction between cognitive avoidance and anorexic/bulimic eating-disordered profiles when threat cues were presented in predictable or unpredictable locations.



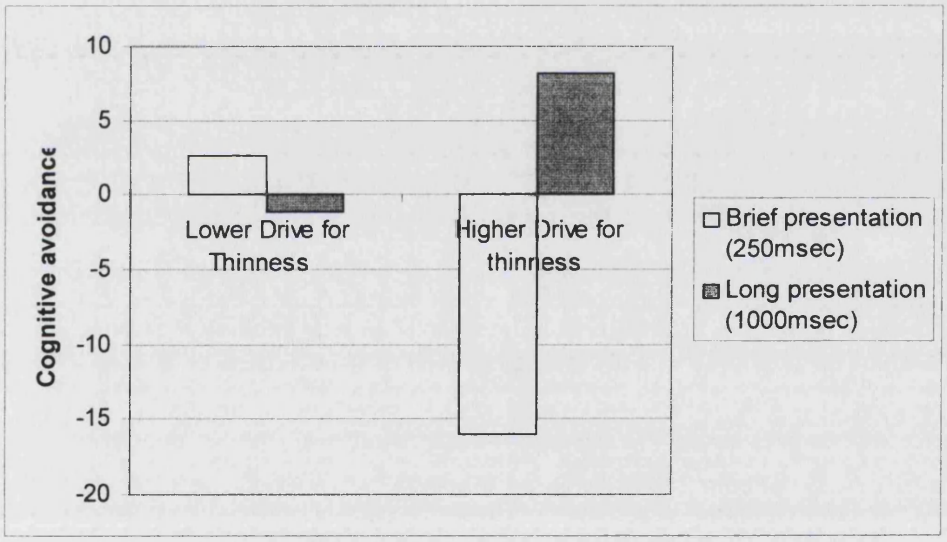
It can be seen from Fig 3.1 that women with at the anorexic pole of the EDI bulimia scale attended towards the threat when presented in an unpredictable location, but avoided the threat when it was presented in a predictable location. In contrast, in individuals at the bulimic pole, there was no clear attentional bias when the threat was in an unpredictable location, but they attended toward the threat when its location was predictable.

3.5.1.3 Cognitive avoidance and drive for thinness (clinical group)

There was an interaction between duration of threat presentation and Drive for thinness. As before, estimated means were calculated for relatively low and high levels of drive for thinness within the clinical group, defined as one standard deviation below (10.89) and above the mean (19.83). These are shown in Figure 3.2.

Figure 3.2

Interaction between cognitive avoidance and drive for thinness in the clinical group, for short and long threat cue presentation.



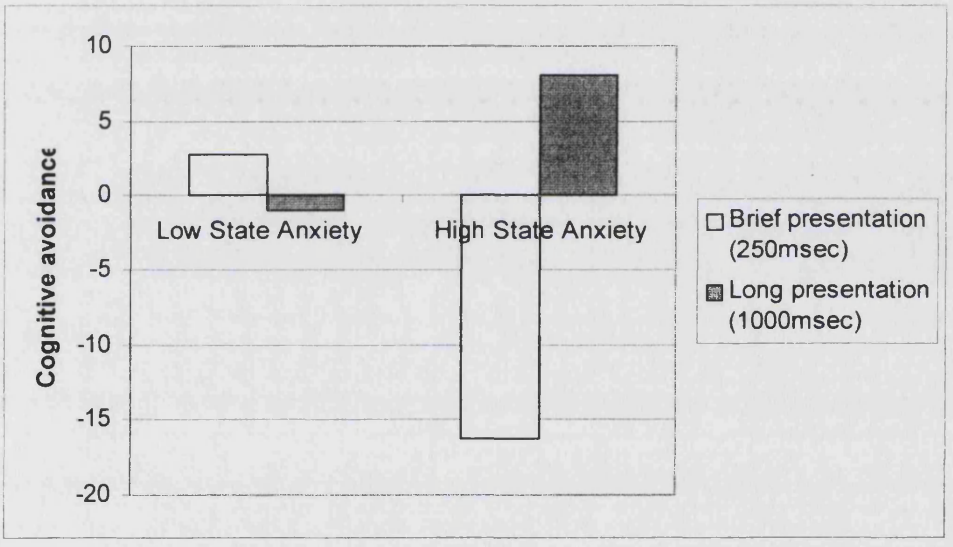
As can be seen on the above figure, individuals with higher levels of Drive for thinness showed an attentional bias towards threat when presented for a short duration (250ms) and cognitive avoidance of threat when presented for a long duration (1000ms). Among women with a lower Drive for thinness, there was no clear pattern of attention toward or away from threat for either long or short presentations.

3.5.1.4 Cognitive avoidance and state anxiety (clinical group)

There was an interaction between the duration of threat presentation and state anxiety. Estimated means were calculated for relatively low and high levels of state anxiety, defined as one standard deviation below and above the mean.

Figure 3.3

Interaction between cognitive avoidance and state anxiety in the clinical group, for short and long cue presentation



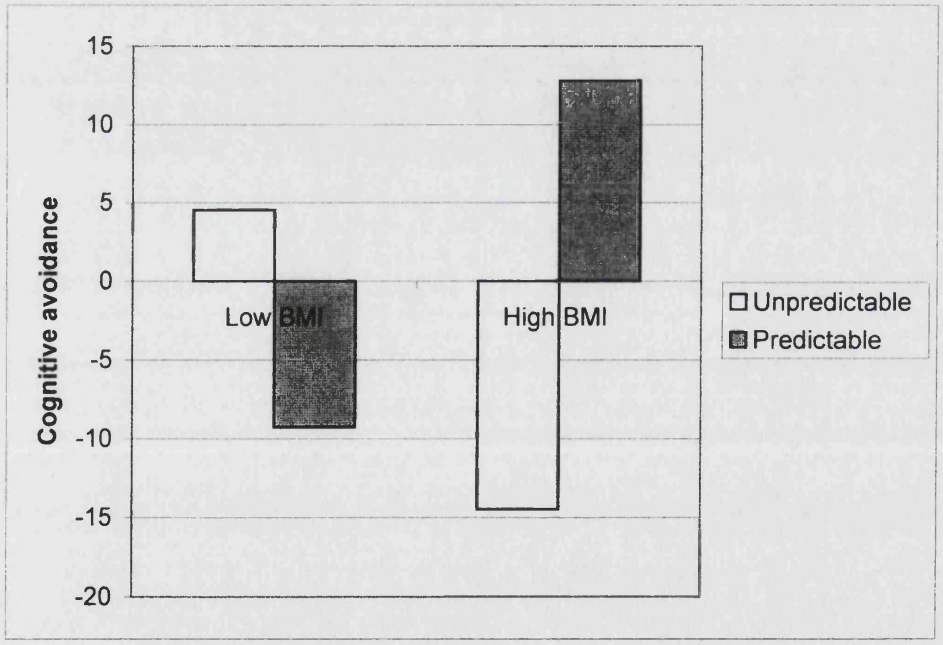
As can be seen in the figure above, women with high state anxiety attended toward threats when presented for a brief duration, but engaged in cognitive avoidance when presented for a longer duration. There was no distinctive pattern of attentional bias in individuals with low state anxiety.

3.5.1.5 Cognitive avoidance and Body Mass Index (clinical group)

There was an unexpected interaction between predictability of threat location and Body Mass Index (BMI). Estimated means were calculated for relatively low and high BMI, defined as one standard deviation below (15.02) and above (24.56) the mean in the clinical group. High BMI was associated with an attentional bias toward unpredictable threats and cognitive avoidance of predictable threats. This association was reversed for those with a low body mass index.

Figure 3.4

Interaction between cognitive avoidance and Body Mass Index (BMI) in the clinical group, according to the predictability of the threat word.



The rationale for entering BMI into the ANOVA was to control for any potential effects of very low weight on cognitive avoidance. Given the unexpected interaction above, an ANOVA was carried to test whether the

interaction seen was due to the effect of low BMI. This was achieved by repeating the ANOVA, using the same dependent variable (cognitive avoidance) and within subjects variables (predictability, duration) but entering very low BMI (under 17.5) versus low to normal BMI (above 17.5) as a between subjects factor. There were no interaction or main effects of BMI and cognitive avoidance here, suggesting that the interaction seen in the main analysis was not due to the effect of low body weight on cognitive avoidance.

3.6 Relationship between cognitive avoidance and schema

The previous section tested for presence of cognitive avoidance of threat in different types of eating pathology. The current section tests the hypothesis that the strength of an individuals' attentional bias will relate to relevant negative schema.

Pearson's two-tailed correlation coefficients were used to investigate the relationship between cognitive avoidance and negative schemas in women with anorexic/ bulimic profiles, in the clinical group as a whole, and in the control group. Due to a relatively poor rate of return of the YSQ (66%) and a significant risk of type I errors (due to the large number of schema measured) the following results should be treated as preliminary findings, which need further investigation. This issue is considered further in the discussion.

Women with an anorexic profile

In women with an anorexic profile, it was predicted that there would be a correlation between the strength of their negative schemas and cognitive avoidance in predictable and / or slow presentations of threat. As discussed previously, an anorexic profile was defined by low scores on the bulimia EDI subscale (one standard deviation below the mean for the clinical group).

Consistent with the above prediction, there was a large correlation between cognitive avoidance of long, predictable threats and schema related to abandonment ($r = .77$, $p = .03$) and dependency/incompetence ($r=0.71$, $p = .04$). This reflects a tendency for women with anorexic tendencies and schema related to abandonment to avoid predictable, long threat cues. There was also a negative correlation between cognitive avoidance of brief predictable threats and schema related to failure ($r = -.71$, $p = .04$). This reflects a tendency for women with anorexic tendencies and schema related to failure to attend toward brief, predictable threats.

There was an unexpected correlation between cognitive avoidance of brief and unpredictable threats and schema related to emotional deprivation ($r = .80$, $p = 0.02$). This suggests that anorexic women with this schema avoided threats that were brief and unpredictable.

Table 3.6: Summary of significant correlations (r) between schemas and cognitive avoidance in women with an anorexic profile.

	Threat type	r value
Emotional Deprivation	Brief, unpredictable	0.80*
Abandonment	Long, predictable	0.77*
Failure	Brief, predictable	-0.71*
Dependence	Long, predictable	0.71*

Women with a bulimic profile

In women with a bulimic profile, it was predicted that there would be a correlation between the strength of their negative schemas and attention toward threat in all conditions of threat presentation. Bulimia was defined by high scores on the bulimia EDI subscale (one standard deviation above the mean for the clinical group = 9.61).

As shown in table 3.7 below, this hypothesis was largely unsupported, with only one correlation being significant. Schemas related to grandiosity/entitlement and were negatively associated with attention toward brief, predictable threats ($r = -.80$, $p = .03$).

Table 3.7: Summary of significant correlations (r) between schemas and women with a bulimic profile.

	Threat type	R value
Entitlement / Grandiosity	Brief, predictable	-0.80*

Clinical group as a whole

No correlations between schemas and cognitive avoidance were predicted in the clinical group as a whole (n=25). As shown in table 3.8 below, there were, however, two positive correlations - between cognitive avoidance of long and predictable threats and abandonment schemas (r = .45, p = .02) and schemas related to social isolation (r = .41, p = .04). This reflects an overall tendency for eating disordered women with these schema to avoid threats that are presented for a long duration (1000ms) and in a predictable location.

Table 3.8: Summary of significant correlations (r) between schemas and cognitive avoidance in the clinical group as a whole.

	Threat type	r value
Emotional Deprivation	Long, predictable	0.41*
Abandonment	Long, predictable	0.45*

Control group

No specific correlations between schemas and cognitive avoidance were predicted in the control group (n = 12). However, as can be seen in table 3.9 below, there were five significant negative correlations between cognitive avoidance of brief and unpredictable threats and schemas related to: abandonment (r = -.76, p = .003); mistrust (r = -.72, p = .008); social isolation (r = -.62, p = .03); emotional inhibition (r = -.62, p = .003); and insufficient control/self-discipline (r = -.60, p = .04). The correlations reflect a tendency

for non-eating-disordered women with relatively high levels of these schemas to orient towards brief, unpredictable threats.

Table 3.9: Summary of significant correlations (r) between schemas and cognitive avoidance in the control group.

	Threat type	R value
Abandonment	Brief, unpredictable	-0.76**
Mistrust / Abuse	Brief, unpredictable	-0.72**
Social Isolation	Brief, unpredictable	-0.62*
Emotional Inhibition	Brief, unpredictable	-0.62**
Insufficient self-control	Brief, unpredictable	-0.60*

CHAPTER FOUR

DISCUSSION

4.1 Overview

This section will first summarise the aims and key findings of the study. The findings will then be discussed in terms of the current theory under testing; in the context of existing literature on eating disorders and in terms of more generic models of information processing. Finally the clinical and research implications will be considered.

4.2 Aims of the study

Research to date shows that schema content is similar across bulimic and anorexic disorders. In order to understand what maintains eating disorders, researchers have recently looked to schema processing (rather than content) to account for the behavioural differences between anorexia and bulimia. Waller (under consideration) has proposed that anorexic pathology involves a primary avoidance of affect through compensatory schema processing. In contrast, bulimic pathology is thought to reflect a behavioural attempt to reduce awareness of negative affect once it has been triggered (secondary avoidance of affect). The current study investigated the hypothesis that anorexic pathology was associated with a primary avoidance of affect, manifesting as a cognitive avoidance of ego threats.

4.3 Summary of findings

As predicted, anorexic pathology was associated with attention away predictable threats and bulimic pathology was associated with attention toward from such threats. However, there was no effect of duration of threat presentation on cognitive avoidance across different types of eating pathology. As expected, there was an overall effect of threat predictability on cognitive avoidance in the clinical group, with attention toward unpredictable threats. In addition, cognitive avoidance of longer threats was associated with a high drive for thinness and high state anxiety. Unexpectedly, high BMI was associated with cognitive avoidance of predictable threats.

There were a number of correlations between negative schema and cognitive avoidance which provided some support for the model, and are discussed in detail below.

4.4 Relationship of findings to the current theory

The main findings are discussed below in terms of the theory being tested.

Finding 1: Attention towards unpredictable threats in the clinical group.

This finding is consistent with previous attentional bias research in eating disorders (Lee & Shafran, 2003) and other clinical populations (Harvey et al, 2004) . It can be explained within the orientation and elaboration phases of Beck and Clark's (1997) model of threat processing. In these initial phases, individuals attend toward threatening stimuli in order to identify and establish

the nature of the threat, before further elaborated processing can occur. The most similar study to date by Reiger et al. (1998) also showed an attentional bias toward negative emotion words in women both with anorexic and bulimic disorders, when presented for a brief duration and in an unpredictable location. The finding supports other research findings (Ainsworth et al, 2001), showing that non-weight or shape related threat words (e.g., 'lonely') are relevant to women with both bulimic and anorexic tendencies.

Findings 2 and 3: Cognitive avoidance of predictable threats in women with an anorexic profile and attention toward predictable threats in women with a bulimic profile.

The model being tested proposes that anorexic pathology should be associated with primary avoidance of affect, in which cognitive avoidance of threat is a necessary first step. In contrast, bulimic pathology should be associated with secondary avoidance of affect, where attention to threat would be expected across all conditions in the study. The finding that women with an anorexic profile attended *away from* predictable threats and that women with a bulimic profile attended *toward* these threats supports the first step of the model - namely that anorexic/bulimic pathologies are associated with attentional biases consistent with a primary versus secondary avoidance of affect. The size of the attentional bias seen is consistent with research into selective attention seen other disorders in dot probe studies, as recently reviewed by Yiend & Mathews (2004).

Finding 4: In the non-clinical group, there were no significant trends in attentional bias toward or away from the threat word.

The trends in attentional bias seen in women with anorexic and bulimic profiles were not present in the non clinical group. The means of the non-clinical group indicate generally lower levels of attentional bias, with no clear pattern of attention towards or away from threat in most conditions. This is consistent with dot probe studies both in eating disorders (Rieger et al, 1998) and other disorders (Harvey et al, 2004), and supports the assumption that the threat word used was not relevant to the non-clinical group as a whole.

Finding 5: In women with an anorexic profile, there was a large correlation between schemas related to failure and attention toward brief, predictable threats.

The theory proposes that primary avoidance of affect in anorexic pathology involves an attempt to prevent negative schemas being activated. For brief and/or unpredictable ego-threats, the individual attends toward the threat to establish the nature of the threat. The greater the relevance of a schema, the greater the attentional bias toward and then away from the threat.

The correlation between schema related to failure and attention toward brief, predictable threats is broadly consistent with the theory, since during brief presentations (250ms) participants may still be establishing the nature of the threat, consistent with the early stages of threat processing (Beck and Clark, 1997).

Finding 6: In women with an anorexic profile, there was a large correlation between schema related to abandonment and dependence/ incompetence and cognitive avoidance of long, predictable threats.

The two correlations above support the hypothesis that given high levels of a schema, individuals with an anorexic profile will avoid related ego-threats. This finding is consistent with schema level processing having a role in the attentional biases seen across anorexic/bulimic pathology.

Finding 7: In women with an anorexic profile, there was a large correlation between a schema related to emotional deprivation and cognitive avoidance of brief, unpredictable threats.

This finding is in the opposite direction to that predicted by the theory, and weakens the argument for a clear link between schemas and cognitive avoidance in anorexic pathology.

One possible explanation of this finding is that anorexic women with high levels of schema related to emotional deprivation manage to attend away from these cues, despite being unpredictable, due a particularly strong drive to avoid ego-threats such as lonely. Although participants suffering from a range of psychological disorders usually attend *toward* brief, unpredictable threats (Harvey et al., 2004), it is possible for individuals to shift their attention away from relatively brief threats (500msec) threats as was found by MacLeod et al. (1986) in normal control subjects.

Finding 8: In women with a bulimic profile, there was only one correlation between negative schema and attention toward threat.

The absence of significant correlations may reflect the small sample size of the sub-analysis, due to poor rates of return for the YSQ-S. The correlation was, however, in the direction predicted by the model, with bulimic women with high levels of a negative schema (grandiosity/entitlement) attending toward threat.

Finding 9: In the clinical group as a whole, there was a correlation between schema related to abandonment and social isolation and cognitive avoidance of long, predictable threats.

This finding suggests that there may be an overall association between the presence of particular schema and cognitive avoidance of relevant threats, regardless type of eating pathology. However, the correlations in the clinical group as a whole were much smaller than those seen in the restrictive group, and may reflect a very strong association between schemas and cognitive avoidance of threat in the subgroup of women with a restrictive profile.

Finding 10: In non-clinical participants, there was a correlation between attention toward brief, unpredictable threats and a number of different schemas (abandonment, social isolation, mistrust, emotional inhibition and insufficient self-control).

The theory made no specific predictions about the relationship between schemas and attentional bias in non clinical participants, and the means for

the group were in the normal range (with the exception of the schema related to self-sacrifice). This finding suggests that non-clinical participants with relatively high levels of these schemas attended toward the threat word during the early phases of threat processing. This is consistent with transdiagnostic theories of concern-relevant processing of threat (Harvey et al, 2004), and suggests that there is a link between attentional processes and negative schemas in asymptomatic individuals.

Additional finding 1: Women with a high drive for thinness showed cognitive avoidance of long-duration threats (1000ms).

This finding was not predicted from the current theory, and suggests that drive for thinness may also be important in cognitive avoidance of threat.

Additional finding 2: Women with high levels of state anxiety showed cognitive avoidance of long threats (1000ms).

This finding was not specifically predicted from the theory, but is consistent with some existing research into threat processing in anxious individuals showing initial attention toward threatening information followed by attentional avoidance (Mogg and Bradley, 1998).

Additional finding 3: There was no effect of being underweight on attention toward/away from threats, but increased cognitive avoidance was seen in eating-disordered women with a high body mass index.

This finding was unexpected and is not easily accounted for within the current theory. The main rationale for entering body mass index as a

covariate was to check that there was no effect of being underweight on task performance. This was established by repeating the ANOVA using low versus normal weight as a between subjects factor. This provides support for the assumption that the finding of cognitive avoidance of threat in women with a restrictive profile was not due to low body weight.

4.5 Relationship of findings to the existing literature

The results can be interpreted within the context of three main areas of existing literature: schema based models of eating disorders; studies of information processing in eating disorders; and transdiagnostic models of selective attention.

4.5.1 Schema based models of eating disorders

Schema based models of eating disorders (Waller et al, in press) propose that anorexic pathology is driven by a process of schema compensation, in which individuals attempt to adopt a cognitive or behavioural style that is the opposite of an underlying early maladaptive schema. Young (1999) proposes that, in early life, these represent functional attempts to cope with aversive experiences, but often become rigid and extreme when extended into adulthood, resulting in apparent confirmation of the original schema. For example, an individual with an abandonment schema might overcompensate by trying to independent and concentrate on being thin as an index of her self-worth, avoiding emotional closeness and personal disclosure.

Within a schema based model of anorexic pathology, compensatory schemas function as a systematic attempt to prevent experience of negative affect (primary avoidance of affect). This is achieved through a consistent effort to reduce awareness of negative hot cognitions, through diverting attention away from ego-threats toward a more acceptable alternative schema, such as emotional inhibition, perfectionism and subjugation.

In bulimic pathology, a schema maintenance process is thought to occur, where individuals attend to information consistent with their underlying negative schemas, experience resultant negative affect, and use bingeing and/or other impulsive behaviours to reduce their awareness of this affect in the short-term. The schema process functions to produce a secondary avoidance of affect, as blocking behaviours are used to reduce awareness of negative emotions once they have been triggered.

The findings of the current study are consistent with the above model. Women with an anorexic profile showed cognitive avoidance of threat, and women with a bulimic profile attended towards threat.

The model allows for both primary and secondary avoidance of affect to occur across both pathologies. Women with bulimia use compensatory strategies during restrictive phases of their disorder, and women with anorexia are not always successful in their attempts to prevent negative affect, and may fall back on blocking behaviours such as alcohol and impulsive self-harm to cope. The overlap described here might explain why

there was an overall tendency for women of both profiles who had a high drive for thinness to show cognitive avoidance of long-duration threats, as it is plausible that for women with a high level of pathology the initial attempt to avoid ego-threats is particularly strong. Further work is necessary to establish whether the attention of women with a bulimic profile but a high drive for thinness would effectively be 'recaptured' by the threat under real-life conditions.

The model for anorexic pathology is supported by the large correlations found between negative schemas and cognitive avoidance, with specific schemas (abandonment; dependency/incompetence) having an apparent relevance for the threat word 'lonely'.

4.5.2 Information processing in the eating disorders

Information processing theories are specifically interested in the way in which material (particularly of an emotional and/or threatening kind) is processed and how this may contribute to the emotional disorder (MacLeod, Mathews & Tata, 1986). Early accounts of information biases in the eating disorders have suggested that they arise from maladaptive schemas associated with food, weight, and the self (Vitousek & Hollon, 1990). In support of this, there is accumulating evidence that patients with eating disorders differ from controls in a number of ways, including enhanced processing for food- and weight-related words and enhanced memory for schema-consistent information (Lee & Shafran, 2004). More specifically, people with eating disorders appear initially to show hypervigilance and orientation towards

threat in the same way as people with anxiety disorders (Ben-Tovim & Walker, 1991; Rieger et al., 1998).

Despite a recent shift in cognitive therapy to deeper levels of cognition, many of the studies to date have concentrated on weight, shape and food related stimuli, with little emphasis on emotional ego-threats. There is, however, some evidence that these kinds of threat are particularly relevant to women with eating disorders (Waller, Watkins, Shuck & McManus, 1996; McManus, Waller, and Chadwick, 1996). Most studies in this field have used the modified Stroop task, which is criticised for potentially assessing selective distractibility rather than any specific attentional bias (Eynsenck, 1992).

The current findings provide additional support to the existing literature, showing attentional vigilance to threat in the initial orientating phase of threat processing in women with eating disorders. In addition, the use of a visual dot probe paradigm with the threat word 'lonely' suggests that this is effect is a genuine attentional bias rather than selective distractibility, and that the bias applies to emotional threats. The fact that different patterns of attentional bias were seen across anorexic and bulimic pathologies suggests that a sophisticated approach is needed to understand the way in which threats are processed in this group.

4.5.3 Information processing biases across psychological disorders

Recent cognitive accounts of emotional disorders have suggested that biases in attention and memory may act as maintenance factors in their

psychopathology (Harvey et al. 2004), with supporting evidence in panic disorder (Clark, 1988), social phobia (Clark & McManus,2002), specific phobias (Thorpe & Slakovskis, 1997), posttraumatic stress disorder (McNally, English and Lipke, 1993), obsessive-compulsive disorder (Rachman, 1997) and depression (Rude, Wenzlaff, Gibbs, Vane & Whitney, 2002). Harvey et al. (2004) have proposed three attentional processes that are transdiagnostic: selective attention to concern-relevant external stimuli; selective attention to concern-relevant internal stimuli (self-focused attention); and attentional avoidance. The current findings provide support for the presence of selective attention to external stimuli and attentional avoidance of external stimuli in eating disorders.

As discussed in the Introduction and Method sections, this experiment was designed in order to allow for automatic processing of threat during brief and/or unpredictable presentations and more elaborated threat processing during long and/or predictable presentations (Beck & Clark, 1997). The findings suggest that women with eating disorders show an initial orientation to emotional threats, but that they able to disengage and attend away from threats in conditions commensurate with elaborated processing.

The results can be interpreted within Klinger's (1996) 'current concern hypothesis', in which people with psychological disorders selectively attend to stimuli that are related to their current concerns, including both threats and sources of safety. In the case of women with an anorexic profile, the neutral word might have effectively been a 'source of safety', which was sought in

conditions that allowed for attentional disengagement from the threat stimuli.

In a recent review, Mogg and Bradley's (1998) cognitive-motivational analysis of attentional processing was proposed as potentially applicable to a range of disorders (Harvey et al., 2004). The model argues that the degree to which an individual attends to a stimulus will depend on their currently active goal and how they appraise the stimulus. The model allows for cognitive avoidance once the nature of the threat has been established, and suggests that avoidance is involved in maintaining anxiety as it prevents re-appraisal of feared stimuli when they are not in fact dangerous. In the current study, it is plausible that women with an anorexic profile were effectively motivated to attend away from emotional threats, as a first step in avoiding negative affect and activating compensatory schema.

Despite a recent theoretical interest in avoidance mechanisms in threat processing to date, there has been relatively little empirical investigation of the phenomena, with only a few studies using paradigms that allow for controlled processing and cognitive avoidance of threat (Harvey et al, 2004). The current findings demonstrate that, in the right conditions of threat presentation, cognitive avoidance can occur in eating disordered women.

4.6 Research implications of these findings

The methodological limitations of the study are outlined below. Then potential avenues for future research are discussed.

4. 6.1 Methodological limitations

There were several important limitations to the study, which will be considered in turn.

Narrow scope of the task

In interpreting the findings, it is clear that the study can only provide support for the first stage of the schema based model, in which women with an anorexic profile show attentional avoidance and bulimic women show attention toward an emotional threat. The study does not directly test the main hypothesis that anorexic pathology is associated with a primary avoidance of affect and bulimic pathology with a secondary avoidance of affect. In order to test this hypothesis it would be necessary to show that lower levels of emotional arousal were seen in women with an anorexic profile compared to those with a bulimic profile in response to threat cues.

Secondly, only one threat word was used in the current study. This limits the generalisability of the findings to other kinds of emotional threat, and provides no evidence for attentional biases in threats relating to weight, shape or eating.

Finally, the task lacks ecological validity, since the attentional biases seen in a simple word-based computerised task may not accurately reflect to how eating-disordered women respond to real life emotional threats. The problem of the low ecological validity of these type of tasks has recently been highlighted both in the field of eating disorders (Lee & Shafran, 2004) and in attentional bias research more generally (Harvey et al., 2004).

Definition of a anorexic / bulimic profile

The EDI bulimia scale was used as a measure of anorexic / bulimic tendencies as within a sample of eating disordered women it has demonstrated its ability to distinguish between anorexic / bulimic pathology in a number of validation studies (Garner, 1991). It was applied in a dimensional rather than categorical manner, as there was continuous range of bulimia scores within the clinical group, reflecting a continuous, rather than bimodal distribution.

However, the measure is limited as it does not measure restriction directly, and anorexic tendencies are inferred through an absence of bingeing / other bulimic tendencies within an eating disordered group of anorexic and bulimic women. In future studies it would be important to measure restrictive behaviours more directly, for example through self-report questionnaires asking about dietary intake and exercise.

Lower power to detect trends in cognitive avoidance in the control group

It was originally planned that the study would consist of three separate clinical groups divided on the basis of their bulimia subscale scores and a control group comparison.

However, having finished the data collection phase of the project, on inspection of the data, it was clear that there was a continuous distribution of bulimia subscale scores. Therefore, instead of creating groups on the basis of artificial cut off scores, it was decided to use a continuous measure of restriction. This increased the power of the study overall, and prevented relatively meaningless comparisons between groups. The problem, however, was that it resulted in a clinical group that was much larger than the control group.

The study was powered primarily to detect differences between different types of pathology within the clinical group. The non-clinical group was included in the study to check that the pattern of cognitive avoidance seen in clinical participants was not present in non eating disordered women. However, given its larger size, it is evident that the clinical group was had greater power to detect trends in attentional bias than the non-clinical group. The mean scores for the non-clinical group support the assumption that there were no apparent trends in attentional bias. However, it would have been preferable to recruit a control group of an equal size to the clinical group.

Low power to detect correlations between schema and cognitive processes

Due to a relatively poor rate of return of the YSQ-S inventory in the clinical group (66%), the sample sizes for correlations between schemas and attentional bias in women with restrictive (n=8) and bulimic profiles (n=7) were small. Given a larger sample, it is plausible that more of the correlations would have reached significance, and the current findings might therefore represent an underestimate of the relationship between schemas and attentional bias. It is also likely that given a wider range of threat words, including those relating to weight, shape and eating would also activate different schema.

Risk of type I errors in the analysis of the relationship between schemas and cognitive avoidance.

Due to the large number of schema measured in Young's questionnaire, there was a significant risk of type I errors in the analysis of the relationship between schemas and cognitive avoidance. A type I error correction was not applied for due to the small sample size of the analyses (see above point) and therefore the low power of the study. However, the results of these analyses can only be considered preliminary, and in writing for publication it would be important to concentrate on schema most relevant to the threat cue (abandonment / social isolation). In future studies, it would be important to ensure a larger sample size for the YSQ questionnaire and correct for type I errors.

4.6.2 Further research

The findings show that women with an anorexic profile avoid emotional threats providing their location is predictable. In addition, despite small sample sizes, there are a number of strong correlations between schemas and cognitive avoidance of threat, suggesting a strong relationship between schema processes and attentional biases in the eating disorders.

In order to establish whether cognitive avoidance of threat is in fact the first step in a primary avoidance of affect in anorexic pathology, further work is needed to investigate the role of other potential cognitive and behavioural manifestations of schema compensation. Some work has already been undertaken in this area, using subliminal cues as a cue for negative affect within a computer-based over searching task (Mountford et al., 2004). There is scope for further studies using supraliminal cues (those accessible to conscious awareness), allowing for a more elaborated, schema-driven response to threat.

Further work is also needed to test the causal relationships between attentional processes and affect in the eating disorders. In the field of anxiety, MacLeod et al. (2002) has manipulated attentional bias to emotional stimuli using the dot probe task, finding evidence supporting a causal role for attention in emotional reactions to a stress task. This work has involved using novel paradigms, where attentional biases towards anxiety-relevant stimuli are enhanced or lessened,. Those paradigms could be extended to patients with eating disorders to examine the specificity of such a mechanism.

The need for attentional bias research using tasks that are as ecologically valid as possible has been emphasised both within eating disorders and in more generic accounts of information processing (Harvey et al., 2004). Lee and Shafran (2004) have recently suggested the use of computer-based tasks that use relevant pictorial stimuli and more 'real-world' studies. As an example, they cite a study in which participants were left in an office for a under a minute and were later asked to recall the objects they saw (Watson et al., 1995).

4.7 Clinical Implications

The findings have a number of clinical implications. In terms of assessment and formulation, they suggest that bulimic patients may seek out schema-relevant information, but that patients with a restrictive profile may avoid schema relevant information.

In restrictive pathology, selective attention away from emotional threats may prevent realistic appraisal and interventions might be targeted at helping the client to learn to appraise the threat for long enough to come to a better understanding of it and then apply skills in coping with emotional arousal. By contrast, in bulimic pathology the appropriate therapeutic strategy might be to find ways to prevent rumination on emotional threats and promote more problem based coping strategies.

Both primary and secondary avoidance of affect share the aim of regulating

emotional arousal. This suggests that interventions for either type of pathology should help clients cope with the range of feelings that may be evoked by engaging in therapy, which may be experienced as an threat to their existing coping strategies. In evaluating any treatment strategy, it would be important to assess whether a change in symptoms was accompanied by a change in cognitive processing, since if not, there might be a greater risk of relapse.

Recently research in anxiety has suggested a causal role for attentional bias in the maintenance of anxiety (MacLeod, Rutherford, Campbesll, Ebsworthy & Holker, 2002) and that there is potential for modification of information processing biases to be used as a specific therapeutic intervention (MacLeod et al, 2002; Wells, 2000). However, within the field of eating disorders, it is clear that further research, with greater ecological validity, needs to conducted before this becomes a clinical reality.

4.8 Conclusions

The results are broadly consistent with a schema-based model of eating disorders. The main hypothesis that women with an anorexic profile would attend away from predictable threats was supported, although there was no evidence of cognitive avoidance of threats of longer duration. There was mixed evidence for the role of specific schema in this process. This study has investigated the first step hypothesised to occur in a process of schema compensation in women with an anorexic profile, namely an attentional avoidance of threat. Further work is needed to establish evidence that

attentional avoidance of threat is associated with a primary avoidance of affect and other compensatory processes.

REFERENCES

Ainsworth, C., Waller, G., & Kennedy, F. (2002). Threat processing in women with bulimia. *Clinical Psychology Review, 22,* 1155-1178.

Agras, W.S., Walsh, B.T., Fairburn, C.G., Wilson, G.T., & Kraemer, H.C. (2000). A multicenter comparison of cognitive-behavioural therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry, 57,* 459-462.

Anderson, A.E., Bowers W, A, Watson, T.A. (2001) A slimming program for eating disorders not otherwise specified: reconceptualizing a confusing, residual diagnostic category. *Psychiatr Clin North Am, 24,* 271-280

Aiken, L. S., & West, S. G. (1991). Multiple regression: testing and interpreting interactions. London: Sage.

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

Barry, D.T., Grilo, C.M. Masheb, R.M. (2002) Gender differences in patients with binge eating disorder. *International Journal of Eating Disorders*, 31, 63-70.

Beck, A.T. (1964). Thinking and depression, 2: theory and therapy. *Archives of General Psychiatry, 10*, 651-571.

Beck, A.T. (1967). *Depression: clinical, experimental and theoretical aspects.* New York: Harper & Row.

Beck, A.T. & Clark, D.A. (1997). An information processing model of anxiety: automatic and strategic processes. *Behaviour Research and Therapy, 35,* 49-58.

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

Ben-Tovim, D.I & Walker, M.K. (1991). Further evidence for the Stroop test as a quantitative measure of psychopathology in eating disorders. *International Journal of Eating Disorders, 10,* 609-613.

Braun, D.L., Sunday, S.R., & Halmi, K.A. (1994). Psychiatric comorbidity in patients with eating disorders. *Psychological Medicine, 24,* 859-867.

Bruch, H. (1973). *Eating disorders.* New York: Basic Books.

Bruch, H. (1982). Anorexia nervosa: therapy and theory. *American Journal of Psychiatry, 139,* 1531-1538.

Channon, S., DeSilva, P., Hemsley, D., & Perkins, R. (1989). A controlled trial of cognitive-behavioural and behavioural treatment of anorexia nervosa. *Behaviour Research and Therapy*, 27, 529-535.

Collings, S & King,M. (1994) 10 year follow-up of 50 patients with bulimia nervosa. *British Journal of Psychiatry*, 164, 80-87.

Connors, M.E. (1996). Developmental vulnerabilities for eating disorders. In Smolak, L., Levine, M.P., Striegel-Moore, R. (Eds.), *The developmental psychopathology of eating disorders: implications for research, prevention and treatment.* (pp. 285-310) New Jersey: Lawrence Erlbaum.

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

Cooper, M., & Turner, H. (2000). Underlying assumptions and core beliefs in anorexia nervosa and dieting. *British Journal of Clinical Psychology, 39,* 215-218.

Cooper, M.J., & Fairburn, C.G. (1992). Thoughts about eating, weight and shape in anorexia nervosa and bulimia nervosa. *Behaviour Research and Therapy, 30,* 501-511.

Cooper, M.J., & Hunt, J. (1998). Core beliefs and underlying assumptions in bulimia nervosa and depression. *Behaviour Research and Therapy, 36,* 895-898.

Clark, D. (1988). A cognitive model of panic attacks. In S. Rachman, & J.D. Maser (Eds.) *Panic: Psychological Perspectives.* (pp 71-89). Hillsdale, NY: Earlbaum Associates.

Clark, D.M. & MacManus, F. (2002). Information processing in social phobia. *Biological Psychiatry, 51*, 92-100.

Dally, P. & Gomez, J. (1979). *Anorexia nervosa.* Heineman Medical Books: London.

Derogatis, L.R. (1977). *SCL-90-R Administration, Scoring and Procedures Manual-II* (Rev.). Towson, MD: Clinical Psychometric Research.

Derryberry, D. & Reed, M.A. (2002). Anxiety-related attentional biases and their regulation by attentional control. *Journal of Abnormal Psychology, 111(2),* 225-236

Dingemans, A.E., Bruna, M.J. Furth, E.F. van (2002). Binge eating disorder: a review. *International Journal of Obesity, 26*, 299-307.

Dixon, N. F. (1981). *Preconscious processing.* Chichester: Wiley.

Dupont, W.D. & Plummer, W (1997) PS power and sample size program available for free on the Internet. *Controlled Clinical Trials*; 18, 274.

Eysenck, M.W. (1992) Anxiety: *The cognitive perspective*. Hove, UK: Erlbaum.

Emanuelli, F., Meyer, C., Dennis, L., Snell, R., Waller, G., Lacey, J.H. (under consideration). Percieved parental behaviours in the eating disorders. The utility of the Young Parenting Inventory. *International Journal of Eating Disorders.*

Fairburn, C.G., Cooper, Z., Doll, H.A., Norman, P., & O'Connor, M. (2000). The natural course of bulimia nervosa and binge eating disorder in young women. *Archives of General Psychiatry, 57,* 659-665.

Fairburn, C.G., Cooper, Z., Doll, H.A.,Welch, S.L. (1999) Risk factors for anorexia nervosa: three integrated case-control comparisons. *Archive of General Psychiatry, 56*, 468-476.

Fairburn, C.G., Cooper, Z. , & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy*, 41, 509-528.

Fairburn, C.G. & Harrison, P.J. (2003). Eating Disorders. *The Lancet*, 361, 407-416.

Fairburn, C.G., Marcus, M.D., & Wilson, G.T. (1993). Cognitive-behavioural therapy for binge-eating and bulimia nervosa: a comprehensive treatment manual. In C.G. Fairburn & G.T. Wilson (Eds.), *Binge-eating: nature, assessment and treatment* (pp. 361-404). New York: Guilford Press.

Fairburn, C.G., Norman, P.A., Welch, S.L., O'Connor, M.E., Doll, H.A., & Peveler, R.C., (1995). A prospective study of outcome in bulimia nervosa and the

long-term effects of three psychological treatments. *Archives of General Psychiatry, 52,* 304-312.

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

Faunce, G.J. (2002). Eating disorders and Attentional Bias: A Review. *Eating Disorders: The Journal of Treatment and Prevention, 10, 125-139.*

Fichter, M.M., Quadflied, N. & Reif (1994). Six-year course of bulimia nervosa. *International Journal of Eating Disorders*, 22, 361-384.

Garner, D.M. (1991). *Eating Disorders Inventory-2.* Odessa, FL: Psychological Assessment Resources.

Garner, D.M., & Bemis, K.M. (1982). A cognitive-behavioural approach to anorexia nervosa. *Cognitive Therapy & Research, 6,* 123-150.

Garner, D.M., & Bemis, K.M. (1985). Cognitive therapy for anorexia nervosa. In D.M. Garner & P.E. Garfinkel (Eds.), *Handbook of psychotherapy for anorexia nervosa and bulimia* (pp. 107-146). New York: The Guilford Press.

Garner, D.M., Olmsted, M.P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia and bulimia. *International Journal of Eating Disorders, 2,* 15-34.

Garner, D.M., Olmsted, M.P., Bohr, Y., & Polivy, J. (1982). The eating attitudes test: psychometric features and clinical correlates. Psychological Medicine, 12, 871-878.

Goldbloom, D.S., & Kennedy, S.H. (1995). Medical complications of anorexia nervosa. In K.D. Brownell & C.G. Fairburn (Eds.), *Eating disorders and obesity: A comprehensive handbook* (pp. 266-270). New York: Guilford.

Goodsitt, A. (1997). Eating disorders: a self-psychological perspective. In D.M. Garner & P.E. Garfinkel (Eds.), *Handbook of treatment for eating disorders* (pp. 205-228). New York: The Guilford Press.

Halmi, K.D., Goldberg, C.S. Eckert, E. Kasper, R. & Davis, J.M. (1977). Pre-treatment evaluation in anorexia nervosa. In R.A. Vigersky (Ed), Anorexia Nervosa. Raven Press: NY.

Halmi, K.A. (1995). Current concepts and definitions. In G. Szmukler, C. Dare & J. Treasure (Eds.), *Handbook of eating disorders: Theory, treatment and research* (pp. 29-42). Chichester: Wiley

Harvey, A., Watkins, E. Mansell, W. & Shafran, R. (2004). Cognitive behavioural processes across psychological disorders: a transdiagnostic approach to research and treatment. Oxford University Press: Oxford.

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

Henderson, M. & Freeman, C.P. (1987) A self rating scale for bulimia. The "BITE". *British Journal of Psychiatry, 150*, 18-24.

Herman, C.P., & Polivy, J. (1980). Restrained eating. In A.J. Stunkard (Ed.), Obesity. (pp. 208-205) Philadelphia: Saunders

Herzog, D.B, Dorer, D.J. Keel, P.K. et al. (1999) Recovery and relapse in anorexia and bulimia nervosa: a 7.5 year follow-up study. *Journal of American Academic Child and Adolescent Psychiatry*, 38, 829-837.

Hoek, H. W. (1993) Review of the epidemiological studies of eating disorders. *International Review of Psychiatry*, 5, 61-74.

Hollon, S. D., & Beck, A.T. (1994). Cognitive and cognitive-behavioural therapies. In S.L. Garfield & A.E. Bergin (Eds.), *Handbook of psychotherapy and behavioural change: an empirical analysis (4th ed.)* (pp. 428-466). New York: Wiley.

James, I.A. (2001). Schema therapy: the next generation, but should it carry a health warning? *Behavioural and Cognitive Psychotherapy, 29,* 401-407.

Klinger, E. (1987). Current concerns and disengagement from incentives. In F. Halich & J. Kuhl (Eds.). Motivation, Intention, Volition, pp 337-347. Berlin: Springer-Verlag.

Klinger, E. (1996). Emotional influences on cognitive processing with implications for theories of both. In P.M. Gollwitzer & J.A. Bargh (Eds). The psychology of action: linking cognition and motivation to behaviour. pp168-189. NY: Guilford.

Layden, M.A., Newman, C.F., Freeman, A., & Morse, S.B. (1993). *Cognitive therapy of borderline personality disorder.* Boston: Allyn & Bacon.

Lee, C.W., Taylor, G., & Dunn, J. (1999). Factor structure of the schema questionnaire in a large clinical sample. *Cognitive Therapy and Research, 23,* 441-451.

Lee, M. & Shafran, R. (2004) Information processing biases in eating disorders. *Clinical Psychology Review, 24,* 215-238.

Leung, N., Waller, G., & Thomas, G. (1999). Core beliefs in anorexic and bulimic women. *Journal of Nervous and Mental Disease, 187,* 736-741.

Leung, N., Waller, G., & Thomas, G. (1999). Group cognitive-behavioural therapy for anorexia nervosa: a case for treatment? *European Eating Disorders Review, 7,* 351-361.

Leung, N., Waller, G., & Thomas, G. (2000). Outcome of group cognitive-behaviour therapy for bulimia nervosa: the role of core beliefs. *Behaviour Research and Therapy, 38,* 145-156.

MacLeod, C. & Mathews, A. (1988). Anxiety and the allocation of attention to threat. *Quarterly Journal of Experimental Psychology, 40,* 653-670.

MacLeod, C. & Mathews, A. (2002). Induced processing biases have causal effects on anxiety. *Cognition and Emotion*, 16, 331-354.

MacLeod, C., Mathews, A. & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95, 15-20.*

McNally, R.J., English, G.E., & Lipke, H.J. (1993). Assessment of intrusive cognitions in PTSD: Use of the modified Stroop paradigm. *Journal of Traumatic Stress, 6*, 33-41.

Masserman, J.H. (1941). Psychodynamics in anorexia nervosa and neurotic vomiting. *Psychoanalytic quarterly, 10*, 211-241.

Masterson, J.F. (1978). The borderline adolescent: An object relations view. In S.C. Feinstien & P.L. Giovacchani (Eds.), *Adolescent Psychiatry, pp* 344-359. Chicago: University of Chicago Press.

Maxwell, P. & Delaney, M. (1990). *Designing experiments and analysing data.* Brooks/Cole: Pacific Grove CA.

McGinn, L.K., & Young, J.E. (1996). Schema-focused therapy. In P.M. Salkovskis (Ed.), *Frontiers of cognitive psychology* (pp. 182-207). New York: The Guilford Press.

McManus, F., Waller, G., & Chadwick, P. (1996). Biases in the processing of different forms of threat in bulimic and comparison women. *Journal of Nervous and Mental Disease, 184,* 547-554.

Meyer, C., & Waller, G. (1999). Subliminal activation of abandonment and eating-related schemata: relationship with eating disordered attitudes in a nonclinical population. *International Journal of Eating Disorders, 27,* 328-334.

Millar, H.R. (1998). New Eating Disorder service, *Psychiatric Bulletin, 22,* 751-754.

Millon, T. (1987). *Millon Clinical Multiaxial Inventory-II manual.* Minneapolis, MN: National Computer Systems.

Minuchin, S., Rosman, B.L., & Baker, L. (1978). *Psychosomatic families: Anorexia nervosa in context.* Cambridge, MA: Harvard University Press.

Mitchell, J.E. (1995). Medical complications of bulimia nervosa. In K.D. Brownell & C.G. Fairburn (Eds.), *Eating disorders and obesity: A comprehensive handbook* (pp. 271-277). New York: Guilford.

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

Modell, A.H. (1978). A narcissistic defence against affects and the illusion of self-sufficiency. *International Journal of Psycho-analysis, 56,* 275-282.

Mogg, K. & Bradley, B. P. (1998). A cognitive-motivational analysis of anxiety. *Behaviour Research and Therapy, 36*, 809-848.

Mogg, K., Bradley, B.P., J. & Painter, M. (1997). Time course of attentional bias for threat information in non-clinical anxiety. *Behaviour Research and Therapy, 35, 297-303.*

Mountford, V. , Waller, G. Watson, D. & Scragg, P (2004) An experimental analysis of schema compensation in anorexia nervosa. *Eating Behaviours, 5,*223-230.

Morrison, N. (2000). Schema-focused cognitive therapy for complex long-standing problems: a single case study. *Behavioural and Cognitive Psychotherapy, 28,* 269-283.

Nielsen S. (2001) Epidemiology and mortality of eating disorders. Psychiatry Clinical North America, 24, 201-214.

Nielsen, S., Moller-Madsen, S., Isager, T (1998). Standardized mortality in eating disorders: a quantitative summary of previously published and new evidence. Journal of Psychosomatic Research, 44, 413-434.

Palmer, R.L. (1993). Weight concern should not be a necessary criterion for the eating disorders: A polemic. *International Journal of Eating Disorders*, 14, 459-465.

Patton, C.J. (1992). Fear of abandonment and binge eating: a subliminal psychodynamic activation investigation. *The Journal of Nervous and Mental Disease, 180,* 484-490.

Petrocelli, J.V., Glaser, B.A., Calhoun, G.B., & Campbell, L.F. (2001). Early maladaptive schemas of personality disorder subtypes. *Journal of Personality Disorders, 15,* 546-559.

Pomeroy, C. Mitchell, J.E., Roerig, J & Crow, S. (2002) Medical complications of psychiatric illness. Washington: American Psychiatric Publishing.

Rachman, S. (1977). A cognitive theory of obsessions. *Behaviour Therapy and Research, 35,* 793-802.

Reiger, E., Schotte, D.E., Touyz, S. W., Beumont, P.J.V., Griffiths, R., & Russell, J. (1998). Attentional biases in eating disorders: a visual detection procedure. *International Journal of Eating Disorders, 23,* 199-205.

Roth, A., & Fonagy, P. (1999). *What works for whom? A critical view of psychotherapy research.* New York: The Guilford Press.

Rude, S.S., Wenzlaff, R.M., Gibbs, B. Vane, J. & Whitney, T. (2002). Negative processing biases predict subsequent depressive symptoms. *Cognition and Emotion, 16,* 423-440.

Russell, G.F.M. (1979). Bulimia nervosa: an ominous variant of anorexia nervosa. *Psychological Medicine, 9,* 429-448.

Russell, G.F.M. (1995). Anorexia nervosa through time. In G. Szmukler, C. Dare & J. Treasure (Eds.), *Handbook of eating disorders, theory, treatment and research* (pp. 5-17). Chichester: Wiley.

Sands, S.H. (1989). Eating disorders and female development: A self-psychological perspective. In A.I. Goldberg, *Progress in Self Psychology* (Vol 5) pp 75 –103. Hillsdale, NY: Analytic Press.

Sargent, J. Liebman, R. Silver, M (1985). Family Therapy for anorexia nervosa. In D.M. Garner & P.E Garfinkel (Eds). *Handbook of psychotherapy for anorexia nervosa and bulimia.* New York: Guilford Press.

Schmidt, N.B., Joiner, T.E., Young, J.E., & Telch, M.J. (1995). The schema questionnaire: investigation of psychometric properties and the hierarchical structure of a measure of maladaptive schemas. *Cognitive Therapy and Research, 19,* 295-321.

Selvini-Palazzoli, M. (1978). *Self-starvation.* New York: Jason Aronson.

Selvini-Palazzoli, M., Boscolo, L., Cecchin, G., & Prata, G. (1978). *Paradox and counterparadox.* New York: Jason Aronson.

Serfaty, M.A., Turkington, D., Heap, M., Ledsham, L., & Jolley, E. (1999). Cognitive therapy versus dietary counselling in the outpatient treatment of anorexia nervosa: effects of treatment phase. *European Eating Disorders Review, 7,* 334-350.

Sharp, C.W. & Freeman C.P.L.(1993) Medical complications of anorexia nervosa. *British Journal of Psychiatry*, 162, 452-462.

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

Spielberger, C.D., Gorsuch, R.L, Lushene,R., Vagg, P.R, & Jacobs, G.A. (1983). *Manual for the State-Trait Anxiety Inventory (Form Y).* Palo Alto: Consulting Psychologists Press.

Steinhausen H-C. (2000). The outcome of anorexia in the 20th century. *American Journal of Psychiatry, 159,* 1284-1293.

Stopa, L., Thorne, P., Waters, A., & Preston, J. (2001). Are the short and long forms of the Young Schema Questionnaire comparable and how well does each version predict psychopathology scores? *Journal of Cognitive Psychotherapy, 15,* 253-272.

Stunkard, A.J. (2002). Binge-eating disorder and the night-eating syndrome. In Wadden, T.A., Stunkard, A.J. (Eds.) *Handbook of obesity treatment.* (pp. 107-121) New York: Guilford Press.

Sugarman, A. (1991). Bulimia: A displacement from psychological self to body self. In C.L. Johnson (Ed), *Psychodynamic treatment of anorexia nervosa and bulimia.* pp 3-33. NY: Guilford Press.

Sugarman, A., & Kurash, C. (1982). The body as a transitional object in bulimia. *International Journal of Eating Disorders, 1,* 57-67.

Sullivan, P.F., Bulik, C.M., Fear, J., Pickering, A. (1998). Outcome of anorexia nervosa: a case-control study. *American Journal of Psychiatry, 155,* 939-946.

Superlab Pro (2002) Version 2. Cedrus Corporation. www.superlab.com.

Tabachnik G. & Fiddell, L.S. (1996) Using Multivariate Statistics (3rd Edition) Harper Collins College Publishers, NY.

Thorpe, S.J. & Salkovskis, P. M. (1997). Information processing in spider phobics: The Stroop color naming task may indicate strategic but not automatic attentional bias. *Behaviour Research and Therapy, 35,* 131-144.

Treasure, J. & Holland A. (1989) Genetic vulnerability to eating disorders: evidence from twin and family studies. In Remschmidt, H, Schmidtm M.H.

(Eds). *Child and youth psychiatry: European perspectives.* (pp. 59-68) New York: Hogrefe and Humber.

Turner, H., & Bryant-Waugh, R. (2001). *Eating disorder not otherwise specified (EDNOS): Profiles of clients presenting at a community eating disorder service.* Paper presented at the 5th London International Conference on Eating Disorders, London, April.

Vitousek, K. (1996). The current status of cognitive-behavioural models of anorexia nervosa and bulimia nervosa. In P.M. Salkovskis (Ed.), *Frontiers of cognitive psychology* (pp. 383-418). New York: The Guilford Press.

Vitousek, K., & Hollon, S .D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research, 14,* 191-214.

Vitousek, K., & Manke, F. (1994). Personality variables and disorders in anorexia nervosa and bulimia nervosa. *Journal of Abnormal Psychology, 103,* 137-147.

Waller (under consideration). A schema-based cognitive behavioural model of the aetiology and maintenance of restrictive and bulimic pathology in the eating disorders. *Journal of Abnormal Psychology.*

Waller, G., & Kennerley, H. (2003) Cognitive-behavioural treatments: current status and future directions. In J. Treasure, U. Schmidt, C. Dare & E. van Furth (eds.), *Handbook of eating disorders: Theory, treatment and research* (2nd ed, pp233-251). Chischester, UK: Wiley.

Waller, G., Kennerley, H. & Ohanian, V. (2004) Schema-focused cognitive behaviour therapy with the eating disorders. In P.du Toit (ed). *Cognitive*

schemas and core beliefs in psychological problems: a scientist-practitioner guide. American Psychiatric Association, Washington DC.

Waller, G., & Meyer, C. (1997). Cognitive avoidance of threat cues: association with eating disorder inventory scores among a non-eating-disordered population. *International Journal of Eating Disorders, 22,* 299-308.

Waller, G., Meyer, C., Ohanian, V., Elliot, P. Dickson, C. & Sellings, J. (2002). The psychopathology of bulimic women who report childhood sexual abuse: The mediating role of core beliefs. *Journal of Nervous and Mental Disease, 189,* 700-708.

Waller, G., & Mijatovich, S. (1998). Preconscious processing of threat cues: impact on eating among women with unhealthy eating attitudes. *International Journal of Eating Disorders, 24,* 83-89.

Waller, G., Meyer, C., & Ohanian, V. (2001). Psychometric properties of the long and Short versions of the Young Schema Questionnaire: core beliefs among bulimic and comparison women. *Cognitive Therapy and Research, 25,* 137-147.

Waller, G., Ohanian, V., Meyer, C., & Osman, S. (2000). Cognitive content among bulimic women: the role of core beliefs. *International Journal of Eating Disorders, 28,* 235-241.

Waller, G., Quinton, S., & Watson, D. (1995). Processing of threat-related information by women with bulimic eating attitudes. *International Journal of Eating Disorders, 18,* 189-193.

Waller, G., Shah, R., Ohanian, V., & Elliot, P. (2001). Core beliefs in bulimia nervosa and depression: the discriminant validity of Young's Schema Questionnaire. *Behaviour Therapy, 32,* 139-153.

Waller, G., Watkins, H., Shuck, V., & McManus, F. (1996). Bulimic psychopathology and attentional biases to ego threats among non-eating disordered women. *International Journal of Eating Disorders, 20,* 169-176.

Waller, J. V., Kaufman, M.R., & Deutsch, F. (1940). Anorexia nervosa: psychosomatic entity. *Psychosomatic Medicine, 2,* 3-16.

Wells, A. (2000). Emotional disorders and metacognition: innovative cognitive therapy. Chichester: Wiley.

Welch, S.L. Fairburn, C. G. (1996). Impulsivity or co-morbidity in bulimia nervosa: a controlled study of deliberate self-harm and alcohol and drug misuse in a community sample. *British Journal of Psychiatry*, 169, 451-458.

Wifley, D.E. Welch, R.R., Stein, R.J. et al. (2002) A randomised comparison of group cognitive behaviour therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge eating disorder. *Archive of General Psychiatry*, 59, 713-721.

Williams, J.M.G., Watts, F.N., MacLeod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorders (2nd edition).* New York: Wiley.

Yiend, J. & Mathews, A. (2004). Biases in Attention: Methods, Mechanisms and Meaning. In Wenzel, A. & Rubin, D. (Eds), *Cognitive Methods in Clinical Research.* APA Books: Washington DC.

Young, J.E. (1994). *Cognitive therapy for personality disorders: a schema-focused approach (2nd ed.).* Sarasota, Florida: Professional Resource Press.

Young, J.E. (1994) *Young Schema Questionnaire- Long Version.* www.schematherapy.com

Young, J.E. (1998) *Young Schema Questionnaire- Short Version.* www.schematherapy.com

Young, J.E. (1999). *Cognitive therapy for personality disorders: a schema-focused approach (3rd ed.).* Sarasota, Florida: Professional Resource Press.

Young, J.E., Beck, A.T., & Weinberger, A. (1993). Depression. In D.H. Barlow (Ed.), *Clinical handbook of psychological disorders (2nd edition)* (pp. 240-277) New York: The Guilford Press.

Zipfel, S., Lowe, B., Reas, D.L., Deter, H., & Herzog, W. (2000). Long-term prognosis in anorexia nervosa: lessons from a 21-year follow-up study. *The Lancet, 355,* 721.

APPENDICES

DEPARTMENT OF MENTAL HEALTH
Chairman: Professor Sheila Hollins

St. George's Hospital Medical School

Professor Glenn Waller
Psychology of Eating Disorders
JENNER WING
CRANMER TERRACE
LONDON SW17 0RE
ENGLAND
Tel:
Fax:
E-mail:

ADDRESS

DATE

Centre Number:
Study Number:
Patient Identification Number for this trial:

Dear ***NAME***

INVITATION TO PARTICIPATE IN A CLINICAL RESEARCH STUDY

Title of Project: **Selective attention and eating problems.**

Name of Researcher: Glenn Waller

As you know, you have recently been referred to the specialist eating disorder service. As part of our continuing effort to improve the treatment that we provide, we are carrying out a study to investigate how individuals with eating problems process information. I would like to ask if you would be willing to take part in this study, to help us to do this. The study involves completing three questionnaires and undertaking a short computerised task.

I enclose an information sheet, which explains more about the study, and a consent form for you to sign if you are happy to take part. I would be grateful if you would return the signed consent form if you are happy to take part.

Yours sincerely

Gill Heath
Trainee Clinical Psychologist

Professor Glenn Waller
St. George's Hospital Medical School.

DEPARTMENT OF MENTAL HEALTH
Chairman: Professor Sheila Hollins

St. George's Hospital Medical School

Professor Glenn Waller
Psychology of Eating Disorders
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Tel:
Fax:
E-mail:

Centre Number:
Study Number:

PATIENT INFORMATION SHEET
(10th March 2003 Version 1)

Title of Project: **Selective attention and eating problems.**

Name of Researcher: Glenn Waller

You are invited to take part in this research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully, and discuss it with friends, family and your GP if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part before returning the consent form.

Consumers for Ethics in Research (CERES) publish a leaflet called *Medical Research and You*. This leaflet gives more information about medical research, and looks at some questions that you may want to ask. A copy can be obtained from CERES, PO Box 1365, London N16 0BW.

Background to the study

Recent research has suggested that the way people with eating disorders process new information acts to maintain their difficulties. In particular, it is thought that people with anorexia and bulimia process new information differently and this may explain the differences in their eating patterns. Gaining a better understanding of how people with eating problems process information may be important in helping us develop better psychological treatments. The current study uses a short computerised task to investigate how people with different eating problems process words and how this differs from people with no history of eating problems.

Why have I been chosen?

You have recently been referred to the Outpatient Eating Disorders Service. All patients who are referred to this service between June 2003 and March 2004 are being asked to take part.

Do I have to take part?

You do not have to take part. If you do not take part, it will have no impact on the treatment that you will be offered.

What will happen to me if I take part?

You will be asked to read and sign a consent form, and to complete a front sheet stating your age, gender and ethnic origin. You will also be asked to complete three simple questionnaires relating to your feelings, attitudes and behaviour. Once completed, the consent form, front sheet and questionnaires can be returned by post in the envelope provided. On coming for your first appointment you will be asked to complete a 15 minute task on a computer, which involves looking at different words and pressing a key when you see a particular letter. The results of this task will not effect your treatment in any way.

What are the possible disadvantages and risks of taking part?

There are no known risks in taking part in this study. The questionnaires ask you about feelings, attitudes eating patterns. If completing the questionnaires or doing the computerised task causes you any uneasy feelings, you are encouraged to discuss this with your clinician at your next therapy session.

What are the possible benefits of taking part?

Your treatment may be improved by the information that you give us on the questionnaires, since we will be more readily able to understand your problem and suggest appropriate treatment strategies.

What if new information becomes available?

Sometimes during the course of a research project, new information becomes available about the topic that is being studied. If this happens, the researcher will tell you about it and discuss with you whether you wish to continue in the study. If you decide to withdraw, the researcher will make arrangements for your care to continue. If you decide to continue in the study, then you will be asked to sign an updated consent form.

On receiving new information, the researcher might consider it to be in your best interests to withdraw you from the study. She will explain the reasons and arrange for your care to continue.

What if something goes wrong?

During research trials, there can be problems due to the methods that are used or due to the way in which you are treated by members of staff. It is highly unlikely that the methods being used in this study will have any harmful effects. However, if you were to be harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for legal action (but you may have to pay the costs). Regardless of this, if you wish to complain about any aspect of the way that you have been approached or treated during the course of this study, the normal NHS complaints mechanisms may be available to you.

Will my taking part in the study be kept confidential?

All information collected about you during the course of the research will be kept entirely confidential. The consent forms will be separated from the questionnaires and held in a locked filing cabinet, so that the questionnaires will themselves remain completely anonymous. However, you will be asked if it is acceptable for the researcher to notify your GP that you are taking part in the research.

What will happen to the results of the research study?

The results of the study will be written up and submitted as a Major Research Project as part of a doctorate in Clinical Psychology. It is also anticipated that the results will be submitted for publication in peer-reviewed journals. You will not be identified in any report or publication. If you should wish, then you will be sent a brief summary of the findings at the end of the study (August 2004).

Who is organising and funding the research?

The research is being organised by Professor Glenn Waller, Chair of the Psychology of the Eating Disorders, St. George's Hospital Medical School. A Trainee Clinical Psychologist (Gill Heath) is carrying out the project. Dr. Pasco Fearon, Lecturer at the Sub-department of Clinical Health Psychology, University College London, is supervising the research.

Who has reviewed the study?

This study has been reviewed and approved by:
- The Wandsworth Local Research Ethics Committee,
- The Research Dept, South West London and St George's Mental Health Services NHS Trust
- The Research and Development Dept, Camden and Islington Mental Health and Social Care Trust

Contact for further information

For further information about the study, please contact: Gill Heath, Trainee Clinical Psychologist via email at heathg9@hotmail.com.

This copy of the Information Sheet is yours to keep. If you agree to take part, then you will be asked to sign a Consent Form, and you will be given a copy of that form.

With many thanks for your time,

Yours sincerely,

Gill Heath
Trainee Clinical Psychologist

Professor Glenn Waller
St. George's Hospital Medical School.

DEPARTMENT OF MENTAL HEALTH
Chairman: Professor Sheila Hollins

St. George's Hospital Medical School

Professor Glenn Waller
Psychology of Eating Disorders
JENNER WING
CRANMER TERRACE
LONDON SW17 0RE
ENGLAND
Tel:
Fax:
E-mail:

Centre Number:
Study Number:

CONTROL GROUP INFORMATION SHEET
(10th March 2003; Version 2)

Title of Project: **Selective attention and eating problems.**

Name of Researcher: Glenn Waller

You are invited to take part in this research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully, and discuss it with friends, family and your GP if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part before returning the consent form.

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Why have I been chosen?

Both undergraduates and postgraduates at the University College London are being asked to participate in this study, to provide a control sample against which the clinical eating disorder sample can be compared.

Do I have to take part?

It is your decision whether or not to take part. If you do decide to participate then you remain free to withdraw at any time.

What will happen to me if I take part?

You will be asked to read and sign a consent form, and to complete a front sheet stating your age, gender and ethnic origin. You will also be asked to complete three simple questionnaires relating to your feelings, attitudes and behaviour. You will also be asked to complete a 15-minute task on a computer, which involves looking at different words and pressing a key when you see a particular letter. You will be given

£2.50 as reimbursement for your time taking part in the study.

What are the possible disadvantages and risks of taking part?

There are no known risks in taking part in this study. It is possible though that you might find participation leads you to question your feelings and attitudes, since these are asked about within the three questionnaires in the study. As such, it is possible that completing the questionnaires may cause you some uneasy feelings. If this is the case then a confidential debriefing/advice session can be arranged by emailing the researcher, Gill Heath at heathg9@hotmail.com.

What are the possible benefits of taking part?

The outcome of this study will help to determine if a clear rationale exists for modifying the treatment of eating disorders. As such, this study might ultimately contribute to improvements in treatment efficacy.

What if new information becomes available?

Sometimes during the course of a research project, new information becomes available about the topic that is being studied. If this happens, the researcher will tell you about it and discuss with you whether you wish to continue in the study. If you decide to continue in the study, then you will be asked to sign an updated consent form.

On receiving new information, the researcher might consider it to be in your best interests to withdraw you from the study. She will explain the reasons for this.

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The results of the study will be written up and submitted as a Major Research Project as part of a doctorate in Clinical Psychology. It is also anticipated that the results will be submitted for publication in peer-reviewed journals. You will not be identified in any report or publication. If you should wish, then you will be sent a brief summary of the findings at the end of the study (August 2004).

Who is organising and funding the research?

The research is being organised by Professor Glenn Waller, Chair of the Psychology of the Eating Disorders, St. George's Hospital Medical School. A Trainee Clinical Psychologist (Gill Heath) is carrying out the project. Dr. Pasco Fearon, Lecturer at the Sub-department of Clinical Health Psychology, University College London, is supervising the research.

Who has reviewed the study?

This study has been reviewed and approved by:
- The Wandsworth Local Research Ethics Committee,
- The Research Dept, South West London and St George's Mental Health Services NHS Trust
- The Research and Development Dept, Camden and Islington Mental Health and Social Care Trust

Contact for further information

For further information about the study, please contact: Gill Heath, Trainee Clinical Psychologist via email at heathg9@hotmail.com.

This copy of the Information Sheet is yours to keep. If you agree to take part, then you will be asked to sign a Consent Form, and you will be given a copy of that form.

With many thanks for your time,

Yours sincerely,

Gill Heath
Trainee Clinical Psychologist

Professor Glenn Waller
St. George's Hospital Medical School.

DEPARTMENT OF MENTAL HEALTH
Chairman: Professor Sheila Hollins

St. George's Hospital Medical School

Professor Glenn Waller
Psychology of Eating Disorders
JENNER WING
CRANMER TERRACE
LONDON SW17 0RE
ENGLAND
Tel:
Fax:
E-mail: g.waller@sghms.ac.uk

entre Number:
tudy Number:
atient Identification Number for this trial:

CONSENT FORM - PATIENT VERSION

itle of Project: **Selective attention and eating problems.**

lame of Researcher: Glenn Waller

	Please initial below
. I confirm that I have read and understand the Information Sheet dated 10th March 2003 (Version 1) for the above study, and have had the opportunity to ask questions.	_____
2. I understand that my participation is voluntary, and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected.	_____
3. I agree to my GP being informed of my participation in this study.	_____
4. I agree to take part in the above study.	_____

_____	_____	_____
Name of patient	Date	Signature
_____	_____	_____
Name of person taking consent (if different from researcher)	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

DEPARTMENT OF MENTAL HEALTH
Chairman: Professor Sheila Hollins

St. George's Hospital Medical School

Professor Glenn Waller
Psychology of Eating Disorders
JENNER WING
CRANMER TERRACE
LONDON SW17 0RE
ENGLAND
Tel:
Fax:
E-mail:

Centre Number:
Study Number:
Patient Identification Number for this trial:

CONSENT FORM - CONTROL VERSION

Title of Project: **Selective attention and eating problems.**

Name of Researcher: Glenn Waller

	Please initial below
1. I confirm that I have read and understand the Information Sheet dated 10th March 2003 (Version 2) for the above study, and have had the opportunity to ask questions.	_____
2. I understand that my participation is voluntary, and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected.	_____
3. I agree to take part in the above study.	_____

_____	_____	_____
Name of patient	Date	Signature
_____	_____	_____
Name of person taking consent (if different from researcher)	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

Wandsworth Local Research Ethics Committee
Room 1.027, 1st Floor Grosvenor Wing,
St Georges Healthcare NHS Trust
Blackshaw Road, Tooting, London SW17 0QT
Direct Line:
Direct Fax:
e-mail:

Our Ref:

24 November 2003

Professor Glenn Waller
Professor of Clinical Psychology
Dept of Mental Health
St George's Hospital Medical School

Dear Professor Waller

Re: Cognitive avoidance of ego-threats in restrictive eating pathology: An experimental test of a schema-based model

Thank you for forwarding a further copy of your reply to my letter dated 6th March 2003. The committee have no record of having received your letter dated 14th April 2003 previously. We are happy to give approval for this project to proceed.

Yours sincerely

Christine Heron
Vice-Chair/Wandsworth Local Research Ethics Committee

South West London NHS
Health Authority

Our Ref:

Wandsworth Local Research Ethics Committee
Room 1.027, 1st Floor Grosvenor Wing,
St Georges Healthcare NHS Trust
Blackshaw Road, Tooting, London SW17 0QT
Direct Line:
Direct Fax:
e-mail: denise.richings@stgeorges.nhs.uk

03 April 2003

Professor G Waller
Department Of Mental Health
St George's Hospital
Cranmer Terrace, Tooting
London 0RE

Dear Professor Waller

Re: Cognitive avoidance of ego- threats in restrictive eating pathology: An experimental test of a schema- based model.

Thank you for your study application, which was considered at our Committee meeting held on Wednesday 26th March 2003.

Before the Wandsworth Local Research Ethics Committee can give full approval to this study we need to know how you will recruit the control subjects.

We look forward to hearing from you.

Yours sincerely

Dr George Hall
Acting Clinical Secretary
Wandsworth Local Research Ethics Committee

EDI

INSTRUCTIONS

The items below ask about your attitudes, feelings and behaviour. Some of the items relate to food or eating. Other items ask about your feelings about yourself.

For each item, decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Circle the letter that corresponds to your rating. For example, if your rating for an item is OFTEN, you would circle the (O) for that item. Respond to all of the items, making sure that you circle the letter for the rating that is true about you. If you need to change an answer, make an 'X' through the incorrect letter and then circle the correct one.

1)	I eat sweets and carbohydrates without feeling nervous	A	U	O	S	R	N
2)	I think that my stomach is too big	A	U	O	S	R	N
3)	I wish that I could return to the security of my childhood	A	U	O	S	R	N
4)	I eat when I am upset	A	U	O	S	R	N
5)	I stuff myself with food	A	U	O	S	R	N
6)	I wish that I could be younger	A	U	O	S	R	N
7)	I think about dieting	A	U	O	S	R	N
8)	I get frightened when my feelings are too strong	A	U	O	S	R	N
9)	I think that my thighs are too large	A	U	O	S	R	N
10)	I feel ineffective as a person	A	U	O	S	R	N
11)	I feel extremely guilty after overeating	A	U	O	S	R	N
12)	I think that my stomach is just the right size	A	U	O	S	R	N
13)	Only outstanding performance is good enough in my family	A	U	O	S	R	N
14)	The happiest time in life is when you are a child	A	U	O	S	R	N
15)	I am open about my feelings	A	U	O	S	R	N
16)	I am terrified of gaining weight	A	U	O	S	R	N
17)	I trust others	A	U	O	S	R	N
18)	I feel alone in the world	A	U	O	S	R	N
19)	I feel satisfied with the shape of my body	A	U	O	S	R	N
20)	I feel generally in control of things in my life	A	U	O	S	R	N
21)	I get confused about what emotion I am feeling	A	U	O	S	R	N
22)	I would rather be an adult than a child	A	U	O	S	R	N
23)	I can communicate with others easily	A	U	O	S	R	N
24)	I wish I were someone else	A	U	O	S	R	N
25)	I exaggerate or magnify the importance of weight	A	U	O	S	R	N
26)	I can clearly identify what emotion I am feeling	A	U	O	S	R	N
27)	I feel inadequate	A	U	O	S	R	N
28)	I have gone on eating binges where I have felt that I could not stop	A	U	O	S	R	N
29)	As a child, I tried very hard to avoid disappointing my parents and teachers	A	U	O	S	R	N
30)	I have close relationships	A	U	O	S	R	N
31)	I like the shape of my buttocks	A	U	O	S	R	N
32)	I am preoccupied with the desire to be thinner	A	U	O	S	R	N

Please turn over and continue

33)	I don't know what's going on inside me	A	U	O	S	R	N
34)	I have trouble expressing my emotions to others	A	U	O	S	R	N
35)	The demands of adulthood are too great	A	U	O	S	R	N
36)	I hate being less than best at things	A	U	O	S	R	N
37)	I feel secure about myself	A	U	O	S	R	N
38)	I think about bingeing (overeating)	A	U	O	S	R	N
39)	I feel happy that I am not a child anymore	A	U	O	S	R	N
40)	I get confused as to whether or not I am hungry	A	U	O	S	R	N
41)	I have a low opinion of myself	A	U	O	S	R	N
42)	I feel that I can achieve my standards	A	U	O	S	R	N
43)	My parents have expected excellence of me	A	U	O	S	R	N
44)	I worry that my feelings will get out of control	A	U	O	S	R	N
45)	I think my hips are too big	A	U	O	S	R	N
46)	I eat moderately in front of others and stuff myself when they're gone	A	U	O	S	R	N
47)	I feel bloated after eating a normal meal	A	U	O	S	R	N
48)	I feel that people are happiest when they are children	A	U	O	S	R	N
49)	If I gain a pound, I worry that I will keep gaining	A	U	O	S	R	N
50)	I feel that I am a worthwhile person	A	U	O	S	R	N
51)	When I am upset, I don't know if I am sad, frightened, or angry	A	U	O	S	R	N
52)	I feel that I must do things perfectly or not do them at all	A	U	O	S	R	N
53)	I have the thought of trying to vomit in order to lose weight	A	U	O	S	R	N
54)	I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close)	A	U	O	S	R	N
55)	I think that my thighs are just the right size	A	U	O	S	R	N
56)	I feel empty inside (emotionally)	A	U	O	S	R	N
57)	I can talk about personal thoughts or feelings	A	U	O	S	R	N
58)	The best years of your life are when you become an adult	A	U	O	S	R	N
59)	I think my buttocks are too large	A	U	O	S	R	N
60)	I have feelings I can't quite identify	A	U	O	S	R	N
61)	I eat or drink in secrecy	A	U	O	S	R	N
62)	I think that my hips are just the right size	A	U	O	S	R	N
63)	I have extremely high goals	A	U	O	S	R	N
64)	When I am upset, I worry that I will start eating	A	U	O	S	R	N

This is the end of the questionnaires. Thank you very much for completing them.

Now go back over the booklet, making sure that you have not missed out any items.

Once you are sure that you have completed all items, please return the booklet as arranged.

SELF-EVALUATION QUESTIONNAIRE

Developed by Charles D. Spielberger
in collaboration with
R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

STAI Form Y-1

Name: _____ Date: _____ S ____

Age: _____ Sex: M _____ F _____ T ____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel *right* now, that is, *at this moment.* There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	I feel calm	①	②	③	④
2.	I feel secure	①	②	③	④
3.	I am tense	①	②	③	④
4.	I feel strained	①	②	③	④
5.	I feel at ease	①	②	③	④
6.	I feel upset	①	②	③	④
7.	I am presently worrying over possible misfortunes	①	②	③	④
8.	I feel satisfied	①	②	③	④
9.	I feel frightened	①	②	③	④
10.	I feel comfortable	①	②	③	④
11.	I feel self-confident	①	②	③	④
12.	I feel nervous	①	②	③	④
13.	I am jittery	①	②	③	④
14.	I feel indecisive	①	②	③	④
15.	I am relaxed	①	②	③	④
16.	I feel content	①	②	③	④
17.	I am worried	①	②	③	④
18.	I feel confused	①	②	③	④
19.	I feel steady	①	②	③	④
20.	I feel pleasant	①	②	③	④

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SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name: _____ Date: _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

		ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21.	I feel pleasant	①	②	③	④
22.	I feel nervous and restless	①	②	③	④
23.	I feel satisfied with myself	①	②	③	④
24.	I wish I could be as happy as others seem to be	①	②	③	④
25.	I feel like a failure	①	②	③	④
26.	I feel rested	①	②	③	④
27.	I am "calm, cool, and collected"	①	②	③	④
28.	I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29.	I worry too much over something that really doesn't matter	①	②	③	④
30.	I am happy	①	②	③	④
31.	I have disturbing thoughts	①	②	③	④
32.	I lack self-confidence	①	②	③	④
33.	I feel secure	①	②	③	④
34.	I make decisions easily	①	②	③	④
35.	I feel inadequate	①	②	③	④
36.	I am content	①	②	③	④
37.	Some unimportant thought runs through my mind and bothers me	①	②	③	④
38.	I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39.	I am a steady person	①	②	③	④
40.	I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④

Name: _____ Age: _____ Date of birth: _____/_____/_____

What is your height? _____ What is your weight? _____

YSQ-S

INSTRUCTIONS:
Listed below are statements that a person might use to describe himself or herself. Please read each statement and decide how well it describes you using the rating scale below. When you are not sure about how a statement applies to you, base your answer on what you emotionally **feel**, not on what you **think** to be true. Using the rating scale below, **choose the highest rating from 1 to 6** that applies to you and write the number in the space before the statement.

RATING SCALE:

1 = Completely untrue of me
2 = Mostly untrue of me
3 = Slightly more true than untrue
4 = Moderately true of me
5 = Mostly true of me
6 = Describes me perfectly

1. _____ Most of the time, I haven't had someone to nurture me, share him/herself with me, or care deeply about everything that happens to me.
2. _____ In general, people have not been there to give me warmth, holding, and affection.
3. _____ For much of my life, I haven't felt that I am special to someone.
4. _____ For the most part, I have not had someone who really listens to me, understands me, or is tuned into my true needs and feelings.
5. _____ I have rarely had a strong person to give me sound advice or direction when I'm not sure what to do.
6. _____ I find myself clinging to people I'm close to because I am afraid they'll leave me.
7. _____ I need other people so much that I worry about losing them.
8. _____ I worry that people I feel close to will leave me or abandon me.
9. _____ When I feel someone I care for pulling away from me, I get desperate.
10. _____ Sometimes I am so worried about people leaving me that I drive them away.
11. _____ I feel that people will take advantage of me.
12. _____ I feel that I cannot let my guard down in the presence of other people, or else they will intentionally hurt me.
13. _____ It is only a matter of time before someone betrays me.
14. _____ I am quite suspicious of other people's motives
15. _____ I'm usually on the lookout for people's ulterior motives
16. _____ I don't fit in.
17. _____ I'm fundamentally different from other people.
18. _____ I don't belong; I'm a loner.
19. _____ I feel alienated from other people.
20. _____ I always feel on the outside of groups.
21. _____ No man/woman I desire could love me once he/she saw my defects.
22. _____ No one I desire would want to stay close to me if he/she knew the real me.
23. _____ I'm unworthy of the love, attention, and respect of others.
24. _____ I feel that I'm not lovable.

Please turn over and continue

25. _____ I am too unacceptable in very basic ways to reveal myself to people.
26. _____ Almost nothing I do at work (or school) is as good as other people can do.
27. _____ I'm incompetent when it comes to achievement.
28. _____ Most other people are more capable than I am in areas or work and achievement.
29. _____ I'm not as talented as most people are in their work.
30. _____ I'm not as intelligent as most people when it comes to work (or school).
31. _____ I do not feel capable of getting on in everyday life.
32. _____ I think myself a dependent person, when it comes to everyday functioning.
33. _____ I lack common sense.
34. _____ My judgment cannot be relied upon in everyday situations.
35. _____ I don't feel confident about my ability to solve everyday problems that come up.
36. _____ I can't seem to escape the feeling that something bad is about to happen.
37. _____ I feel that disaster (natural, criminal, financial, or medical) could strike at any moment.
38. _____ I worry about being attacked.
39. _____ I worry that I'll lose all my money and become destitute.
40. _____ I worry that I am developing a serious illness, even though nothing serious has been diagnosed by a physician.
41. _____ I have not been able to separate myself from my parent(s), the way other people my age seem to.
42. _____ My parent(s) and I tend to be overinvolved in each other's lives and problems.
43. _____ It is very difficult for my parent(s) and me to keep intimate details from each other, without feeling betrayed or guilty.
44. _____ I often feel as if my parent(s) are living through me - I don't have a life of my own.
45. _____ I often feel that I do not have a separate identity from my parents or partner.
46. _____ I think if I do what I want, I'm only asking for trouble.
47. _____ I feel that I have no choice but to give in to other people's wishes, or else they will retaliate or reject me in some way
48. _____ In relationships, I let the other person have the upper hand.
49. _____ I've always let others make choices for me, so I really don't know what I want for myself.
50. _____ I have a lot of trouble demanding that my rights be respected and that my feelings be taken into account.
51. _____ I'm the one who usually ends up taking care of people I'm close to.
52. _____ I am a good person because I think of others more than of myself
53. _____ I'm so busy doing things for the people that I care about that I have little time for myself.
54. _____ I've always been the one who listens to everyone else's problems.
55. _____ Other people see me as doing too much for others and not enough for myself.
56. _____ I am too self-conscious to show positive feelings to others (e.g. affection, showing I care).
57. _____ I find it embarrassing to express my feelings to others.
58. _____ I find it hard to be warm and spontaneous.
59. _____ I control myself so much that people think I am unemotional.
60. _____ People see me as uptight emotionally.
61. _____ I must be the best at most of what I do; I can't accept second best.
62. _____ I try to do my best; I can't settle for "good enough".
63. _____ I must meet all my responsibilities.
64. _____ I feel there is constant pressure for me to achieve and get things done.

Please turn over and continue

65. _____ I can't let myself off the hook easily or make excuses for my mistakes.
66. _____ I have a lot of trouble accepting "no" for an answer when I want something from other people.
67. _____ I'm special and shouldn't have to accept many of the restrictions placed on other people.
68. _____ I hate to be constrained or kept from doing what I want.
69. _____ I feel that I shouldn't have to follow the normal rules and conventions other people do.
70. _____ I feel that what I have to offer is of greater value than the contributions of others.
71. _____ I can't seem to discipline myself to routine or boring tasks.
72. _____ If I can't reach a goal, I become easily frustrated and give up.
73. _____ I have a very difficult time sacrificing immediate gratification to achieve a long-term goal.
74. _____ I can't force myself to do things I don't enjoy, even when I know it's for my own good.
75. _____ I have rarely been able to stick to my resolutions.

Thank you very much for answering these questions.

Please continue with the next questionnaire.

Protocol for the computer task

I am going to ask you to do a task on the computer. It takes 10 minutes to complete.

At the start of the task you will see a screen asking you to press any button on this box. (The researcher shows the participant the Cedrus response box, which has four buttons on it, one of which is labelled E and one is labelled F.)

During the task you will see the letters E and F appear on the computer screen.

When you see the letter E press the E button on the box.

It's the same for the letter F, so when you see the letter F on the screen press F on the box.

The task is timed so try to be as quick as possible but also be careful to make as few mistakes as possible

If you do make a mistake, don't worry, just keep going.

Are there any questions you want to ask?