

**Cognitive Processing of Threat Information in Female  
Eating Disorder Patients: The Role of Attentional Bias  
and Cognitive Avoidance**

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## **Written Exercise 1: Personal & Professional Development Essay**

**Discuss the role of the therapeutic relationship in effecting change with clients. Compare and contrast at least two different theoretical orientations.**

## Personal and Professional Development

**Discuss the role of the therapeutic relationship in effecting change with clients. Compare and contrast at least two different theoretical orientations.**

### INTRODUCTION

*After approximately a half century of psychotherapy research, one of the most consistent findings is that the quality of the therapeutic alliance is the most robust predictor of treatment success*

(Safran & Muran, 2000, p. 1).

One route to answering the question lies in concentrating on the therapeutic relationship as a predictor of successful outcome in psychotherapy, rather than a focus on the effectiveness of specific techniques of a therapeutic model. In order to do this, I will address and attempt to define the role of the relationship within three theoretical orientations, how it is conceptualized through theory, and how it functions to implement change in outcome research. I have chosen to explore the therapeutic relationship as a predictor of change in cognitive-behavioural therapy (CBT), family therapy and existential psychotherapy. The reason for choosing these approaches was that they each reflect the different levels at which therapy operates; the individual (CBT), a systems level (family therapy) and the world level (existential). Using these therapeutic methods, I will aim to illustrate my belief that the relationship is the key component in effecting change for clients and not the model used.

The therapeutic relationship refers to a bond formed between client and therapist during psychotherapy (Orlinksy & Howard, 1986). It is now recognized across theoretic orientations as being one of the core conditions for facilitating therapy and implementing clinical change (Hazler & Barwick, 2001; Safran & Segal, 1990). The interest in the therapeutic relationship may be, in part, an attempt to understand the shared, non-specific conditions that all therapists use to promote change (Hazler & Barwick, 2001). This has been spurred on by meta-analytic studies indicating

that no one therapy has been shown to be more effective than another (Bergin & Garfield, 1994; Gaston, 1990; Hunt, 1993; Horvath & Symonds, 1991; Orlinsky & Howard, 1994). The growing body of evidence seems to suggest that it is the quality of the relationship that is more important for positive outcome and therapeutic efficacy, than the therapeutic techniques employed. If the relationship is lacking, the therapy is less likely to be of benefit regardless of the therapeutic approach (The Department of Health, 2001; Horvath & Symonds, 1991; Martin, Gaske, & Davies, 2000; Roth & Fonagy, 1996; Safran & Muran, 2000; Safran & Segal, 1990).

### **A conceptualization of the therapeutic relationship**

Many commentators have stressed the importance of a solid therapeutic relationship as a prerequisite for change, regardless of the model used. It has been suggested that there are core dimensions that can be applied transtheoretically (Bordin, 1979; Gaston, 1990; Luborsky, 1994; Orlinsky, Grawe & Parks, 1994,). Bordin's (1979) theory of a working therapeutic alliance provides a comprehensive conceptualisation that is widely cited (Horvath & Greenberg, 1994; Johnson & Wright, 2002; Safran & Muran, 2000; Safran & Segal, 1990). The theory presupposes that all psychotherapies need a strong alliance to be effective. The type of alliance and the demands placed on the therapist and client will vary across therapies. The strength of the alliance will be determined by the compatibility of client and therapist with these demands (Johnson & Wright, 2002).

According to Bordin (1979), the alliance is based upon interdependent components; the strength of agreement between client and therapist about the tasks and goals of therapy and on the quality of the interpersonal bond between them. Tasks refer to the specific skills of a therapy and the degree of concordance with these and the client's expectations of therapy. There must be mutual agreement on the goals set and the client must feel that the therapist is invested in helping them. The affective bond signifies the 'human relationship' (Bordin, 1979, p. 254) between therapist and client, which will be influenced by life experience and use of self on the part of both, as well as the therapeutic model chosen. The strength of task and goal agreement will have an ongoing influence

on, and be influenced by, the quality of the affective bond between the therapist and the client (Safran & Muran, 2000).

Bordin (1979) provides a framework for viewing the alliance as a construct that can operate similarly across treatment modalities. The theory acknowledges that the alliance may shift to accommodate different tasks and goals. Each therapy may therefore require different types of alliance and be at risk of inducing characteristic breaches in the alliance (Horvath & Greenberg, 1994). Bordin's (1979) conceptualisation of the alliance goes a long way to emphasising its complex and changing nature. The work stresses that regardless of therapeutic orientation, the relationship is likely to have the most influence on therapeutic change, as it is a prerequisite for therapeutic technique. Bordin (1979) seems to suggest that theoretic orientation is simply a further aspect of the relationship, as the therapist will use it to inform their behaviour when performing the therapist role. Adherence to a treatment model will, to a great extent, be a part of the therapists self and beliefs (Orlinsky et al, 1994).

The importance of a good therapeutic alliance has been demonstrated and attempts have been made to theorise it. It remains unclear quite what makes the relationship work effectively. There has been a proliferation of measures, notably Horvath & Greenberg's (1987, 1994), produced to attempt to quantify the alliance and to demonstrate the validity of the concept in promoting positive therapeutic outcome. Most of the work has been directed at client characteristics in the relationship and little attention has been paid to therapist factors, although this is changing (Roth & Fonagy, 1996). There remains a great deal of disagreement about the factors that constitute an effective therapeutic relationship (Bohart & Greenberg 1997; Hausner, 2000; Orlinsky & Howard, 1994; Stricker & Fisher, 1990). There seems to be two main hypotheses; that the relationship is the main agent of change, or that it is a necessary, but not sufficient, condition for therapy success (Burns & Auerbach, 1996). The remainder of this essay will be devoted to exploring how the therapeutic relationship is conceptualised in three diverse treatment models, exploring whether it is seen as an important component for change and if so, how it is seen as bringing about this change.

## THE THERAPEUTIC RELATIONSHIP IN COGNITIVE BEHAVIOURAL THERAPY

*Any cognitive or behavioural technique not embedded in the context of a trusting therapeutic relationship will probably fail.*

(Burns & Auerbach, 1996, p. 150).

The belief that therapeutic relationship, or working alliance, is secondary to technique in cognitive therapy is one that CBT commentators are increasingly keen to dispel (Burns & Auerbach, 1996). However, the place and importance of the relationship in CBT remains in hot debate. CBT requires a therapeutic environment, with an emphasis on collaboration. What requires clarification is what collaboration consists of, and how much it contributes to an effective therapeutic relationship. The concept of collaborative empiricism (Beck, 1979) is central to a cognitive approach. The therapist and client work together on the mutually identified problem-focused goals, the ultimate aim being to instruct the client in monitoring thought processes and testing them out. In this way the client's thoughts and beliefs are viewed as hypothesis to be tested (Moorey, 1996).

The thread of collaboration runs through the intervention. The rationale being that the client knows the most about their problem, so a collaborative stance gives the client an active role in the therapeutic process. This is thought to reduce conflict, encourage self-efficacy and facilitate the learning of cognitive techniques (Moorey, 1996). CBT fits well into Bordin's (1979) conceptualisation of the alliance. Collaboration is one of the core conditions, that make CBT effective and the therapist uses it, as a skill to direct the therapeutic relationship (Hazler, 2001). The collaborative dynamics will change as the therapy progresses. At first the therapist will be more directive in socialising the client to the model and its techniques and later the dynamics will shift as the client takes on the techniques and becomes more independent in testing out their hypotheses (Hazler, 2001, Moorey, 1996).

There does seem to be a power imbalance inherent within the collaborative nature of the working alliance in CBT. Proctor (2003) draws attention to the very powerful position of the CBT therapist in



respect to the client and highlights the dangers in taking on the stance of an objective and neutral scientist. It is assumed that the therapist possesses the knowledge about adaptive thoughts and behaviours and imparts that knowledge, through cognitive restructuring, onto the patient (Proctor, 2003). It is suggested that the client only actually contributes to an existing treatment agenda, already drawn up by the therapist, under the guise of a collaborative relationship; 'the whole approach of one way of thinking being the answer for everyone is directly in contradiction to respecting the autonomy of each individual client' (Proctor, 2003, p. 15). This underlines the importance of establishing an effective therapeutic relationship prior to using CBT techniques. Indeed, the use of CBT techniques seems, in particular, to require a solid working relationship to be effective, otherwise methods like cognitive restructuring, have the potential to be viewed as threatening by the client (Safran & Muran, 2000).

### **The relationship in CBT**

The variables that make up the therapeutic relationship have not received much attention in CBT research. Considering the wealth of work on the efficacy of the therapy itself and its techniques, this gives the appearance that the relationship is not as valued in CBT, as it may be in other approaches. Hazler (2001) points out that in CBT the relationship is enmeshed with technique and not easily separated out. He states that while most of the focus of the literature is on technique, what most CBT therapists are actually concerned with are factors within the relationship (Hazler, 2001).

Hazler (2001) offers some discussion around the core conditions, which enable CBT techniques to be implemented. These include many factors of the relationship such positive reinforcement of clients' progress, reflecting enthusiasm to clients while attending to the non-verbal behaviours that convey empathic listening. Burns & Auerbach (1996) also make the point that the behaviours that may be called therapeutic technique in CBT, are actually the same types of action that convey empathy; listening, observing and accurately reflecting. In this way, there seems to be nothing discretely different about CBT therapists than in any other approach. The generic counselling

qualities of warmth, genuineness and accurate empathy, identified by those such as Rogers (1957) and Egan (1994) are considered to be essential for effective CBT (Burns & Auerbach, 1996; Hazler, 2001; Moorey, 1996) as they are in many other therapeutic approaches. Moorey (1996) suggests that the fundamental difference for CBT therapists is the acceptance and integration of the cognitive model into the therapists self. Therapists who appear genuine are thought to increase motivation and confidence in the client (Hazler, 2001) and this perhaps ties in with the acceptance and belief in the model.

### **The relationship as a tool for change in CBT**

The view does seem to be that a collaborative therapeutic relationship is necessary to enhance the efficacy of cognitive techniques but the relationship in itself is not the main agent of change (Beck, 1979). The lack of a research into these non-specific relationship variables has been discussed above. Despite this, however, there has been some key research pointing to the association of the therapeutic alliance with positive therapeutic outcome (Burns & Nolen-Hoeksema, 1992; Gaston, Thompson, Gallagher, Cournoyer & Gagnon, 1998; Persons & Burns, 1985; Safran & Segal, 1990; Waddington, 2002) but to date the role of the relationship in effecting change in CBT remains unclear.

## **THE THERAPEUTIC RELATIONSHIP IN FAMILY THERAPY**

According to Pincus (1995), the therapeutic alliance in family therapy can be seen as,

'consisting of those aspects of the relationship between and within the therapist and patient systems that pertains to their capacity to mutually invest in and collaborate on the goals of therapy' (Pincus, 1994, p. 61).

Despite this, the field seems to be without a unifying conceptual framework of the relationship and its efficacy (Flaskas, 1997). The relationship, as opposed to the techniques, would seem to be of

ultimate importance in family therapy with the potential for complex therapeutic relationships with multiple members (Rait, 2000). It would seem that the family therapist would need to possess particular skills and have considerable knowledge of how involvement in the family system can influence therapist, family and outcome. An fuller understanding of the relationship in family therapy, in particular the position of the therapist in relation to the family, can be gained from an understanding of how it is viewed within the two opposing schools. The reader should bear in mind that it is considered important by all schools to establish and maintain a positive therapeutic relationship within the family (Rait, 2000).

Within the structural approach to family therapy Minuchin (1974, 1996), the therapist may choose to work from two alternate positions, the restrained or transference position of outsider looking in, or the interventionist, existential position of working inside the family (Minuchin, 1996). From an interventionist standpoint, the therapist is seen as personally committed and active in the therapeutic process. They attempt to join the family and in turn, the family must accept the therapist (Harari, 1996). In this personal commitment, the therapist seems to act as the agent of change and uses their own self in forming alliances with family members. The interventionist family therapist may deliberately attempt 'rock the boat' of the family system by supporting one individual, or subsystem, at the expense of another (Rait, 2000). They may temporarily choose a co-therapist from among family members when it is felt important to do so and will change co-therapist during and across sessions, as necessary (Minuchin, 1996). The concept of a co-therapist is integral in the therapist endeavor to develop new hypotheses and situations for the family to consider. A focus on the interactions of the therapist and their use of self as the agent of change in family therapy, stresses the point that it is the relationship, as this will influence the delivery of any therapeutic technique, that is likely to be the essence of change.

Within the systemic school (Palazzoli, 1980), considered a restrained approach by Minuchin (1996), the concern is not to impose the therapists self onto the family, in case this is overwhelming. The neutrality of the therapist is given weight and as such it has something in common with CBT. There are two methods of action in which therapist neutrality may operate; by remaining unresponsive to the emotional needs of all family members or by aligning oneself equally to all (Harari, 1996).

Systemic therapists are now more keen to state that adopting a neutral position does not imply indifference or disinterest in the family, rather the therapist uses their curiosity and their empathy to remain sufficiently detached in order to provide useful hypotheses for the family's difficulties (Cecchin, 1987). The therapist must carefully attend to their role within the family as it will shift across the therapeutic problems within the family and its members (Harari, 1996). This is acknowledged as being a very difficult task and is perhaps why intensive supervision, in many forms, is key in family therapy (Flaskas, 1997, Minuchin, 1996). One of the functions of the reflecting team in the systemic approach is to monitor the therapists' relationship within the family and provide useful feedback, which may generate further hypotheses for the family (Harari, 1996).

In the family therapy field, the model of working the therapist adopts is crucial in understanding the position they take up within the family (Rowan & Jacobs, 2002) but it is perhaps not helpful, in thinking about the therapeutic relationship, to see family therapists in terms of this split between schools. A way of viewing the different stances as interventionist/restrained (Minuchin, 1996) or direct/indirect (Rait, 2000) is perhaps more beneficial as there are shared issues and commonalities. The emotional vulnerability of the therapist to the influence of the family system has long been acknowledged (Rait, 2000; Flaskas, 1997). All therapists use their selves when forming the relationship (Rowan & Jacobs, 2002). Their skills and therapeutic preferences are closely allied to 'the therapist's personal characteristics, level of comfort, and theoretical commitments, as well as his or her match with the particular family' (Rait, 2000, p. 215). As Bordin's model (1979) would emphasise, this can result in unique impasses and difficulties in the relationship. The relationship can be threatened when the family react to the therapists' presence in a way designed to maintain the habitual way of functioning that the family finds most comfortable. The therapist then,

'subsequently finds him or herself in the paradoxical position of trying to perform the impossible task of helping the couple or family to change their situation while simultaneously operating under the same rules of interaction that have preserved the problematic situation.' (Rait, 2000, p. 215 ).

It was in attempt to counteract this 'pull' into the family that the team approach was introduced into systemic family therapy (Tomm, 1984 in Rait, 2000) to enable the therapist to remain neutral and in control. Johnson and Wright (2002) have illustrated the utility of Bordin's (1979) conceptualization with family therapy but point out that it may need to be extended, as it does not adequately account for the differences between individual and family therapies.

### **The relationship as a tool for change in family therapy**

Family therapists acknowledge that research into the therapeutic relationship in family therapy is still in its infancy and as such the effect is not well understood (Flaskas, 1997; Flaskas & Perlesz, 1996; Rait, 2000). The literature often seems to ignore the therapist as the instrument of change in its focus on technique. Minuchin (1996) considers this a by-product of family therapists' desire to distance the theory from psychoanalytical models. The important theoretical and research work into the relationship has suffered as a result.

Family therapy does seem to acknowledge and use the relationship itself as a therapeutic technique and there seems to be growing recognition that, despite the different treatments of the alliance, it is this relationship that is the key factor in producing change (Flaskas & Perlesz, 1996; Minuchin, 1996; Rait, 2000). Its neglect in the research is beginning to be acknowledged (Flaskas, 1997). There have been steps taken to develop and use theoretically based instruments that measure aspects of the relationship, most notably the Family Therapy Alliance scale based on Bordin's (1979) model (Pinsof, 1994).

Taken as a whole, these findings seem to confirm the importance of the relationship within family therapy. However the research, although promising, is not without its problems. Horvath & Symonds (1991) made the point that the most accurate reports of the relationship in predicting outcome are those rated by the client. Much of the literature in the field so far is based upon therapist ratings of the alliance. The measurements in themselves often involve combining each member of the family's ratings of the alliance to obtain one single alliance score (Johnson & Wright,

2000; Pinsof, 1994). This is problematic as it is realistic to believe that not all family members will have the same views of the therapy relationship.

The acknowledgement of the importance of the therapy relationship in family therapy theory, is somewhat overshadowed by the neglect in the research. Important aspects, such as the emotional involvement of the therapist, their use of self, the different qualities of relationship that may develop between a family and their therapist over time and the therapist factors that may influence its development are all worthy of consideration. More work into this area in future seems likely to stress the importance of the therapeutic relationship, over family technique, in engendering change.

### **THE THERAPEUTIC RELATIONSHIP IN EXISTENTIAL PSYCHOTHERAPY**

*'Therapists must convey to the patient that their paramount task is to build a relationship together that will itself become the agent of change'*

(Yalom, 2001, p. 34)

I have some distinct reasons for including existential thought in this discussion of the therapeutic relationship. The consideration of the relationship from an existential perspective is important, as existential ideas can be usefully incorporated into other therapeutic orientations. Ideally, existential psychotherapy is not considered to be a separate orientation or school. As Yalom puts it, 'therapy should not be theory driven but relationship driven' (2001, p. xviii) and an awareness of existential issues will influence the therapeutic endeavour across orientations. I will refer primarily to Yalom's (1980, 1989, 2001) work in this section, although other existential psychotherapists have offered their own considerations of the alliance. It seems that the existential approach gives the most therapeutic weight to and prioritises the relationship more than any other (Spinelli, 2002, Yalom, 2001). From this stance, it has a lot to offer other forms of therapy that may favour a focus on technique over maintenance and fostering of the relationship.

According to Yalom (1980) 'existential psychotherapy is a dynamic therapeutic approach that focuses on concerns rooted in human existence' (p. 3). Those concerns are isolation, death, meaning in life and freedom, and the integral struggle with the person's way of being against these harsh facts of life (Spinelli, 1997, 2001, Yalom, 1980, 1989, 2001). Further expansion of these themes is not possible within the scope of this essay, so I will concentrate on the existential view of the centrality of the relationship and its function as an agent of change.

The essential idea in existential work is that most patients seeking therapy do so as a result of difficulties in relationships and with intimacy (Yalom, 1980). As a result of this viewpoint, it makes sense that therapy would be primarily about the relationship. The therapist is not seen as expert but is an active participant in the therapeutic process, open and willing to share in the patient's world-view and experience. The relationship is conceptualised as one where both are 'fellow travellers' (Yalom, 2001, pg. 8). The client is ultimately responsible for progress and change. The therapist is there to help the client explore their relationships, through the here-and-now of the therapeutic encounter (May, 1953, 1961), or as Yalom puts it, the 'inbetweenness' (2001, p. 46) of the relationship. It is this human connection that is viewed as the essential element of change (Hazler, 2001).

Like other psychodynamic and analytic approaches, existential psychotherapy views the therapeutic relationship as a reflection of the client's wider relationship issues in miniature, therefore, interpersonal difficulties will manifest in therapy (Yalom, 1989, 2001). Yalom (2001) advises therapist's to use their own feelings as a source of data highlighting the reactions the client is likely to evoke in others. He stresses that it is important to know how much of the feelings belong to you and how much are being evoked by the client. According to Yalom, (1989, 2001) this indicates the need for therapists to have extensive therapy themselves. This idea seems as if it may be someone out of favour in the current therapeutic climate. As a trainee, it feels important to understand how my own beliefs and potential reactions to clients may facilitate or hinder the therapeutic relationship.

## **The relationship as a tool for change in existential psychotherapy**

There is an absence of outcome research in demonstrating either the effectiveness of the approach, or exploring how working with the relationship in this way effects change. With the relationship and therapy being tailored so individually in existential psychotherapy, the problems with measuring the effectiveness of the relationship as a therapeutic agent of change are not difficult to imagine. It would be problematic to attempt to standardise a therapeutic relationship that will vary enormously through being uniquely tailored to the individual. There are well written and engaging, case studies (Yalom, 1989, 1999, Randall, 2001), which, seem to have positive outcomes. Lantz and Gregoire (2000a, 2000b, 2003a, 2003b) have produced extensive, long-term studies, which have indicated significant clinical improvement using existential psychotherapy across a variety of client groups and presenting problems.

Yalom (2001) assents that for the most part his practice of existential psychotherapy is for long-term; he has some strong views on the ethics and legitimacy of short-term therapy, fee-paying clients whose problems are not debilitating. However, Spinelli (2001) has recently produced work, which may support increasingly wider applications of existential ideas, as he proposes the use of an existential approach with psychosis.

The existential approach does fit with Bordin's (1979) conceptualisation of the relationship. It stresses the importance of the relationship as a tool for change, over technique, at all times. The approach has tasks and goals, unique to itself, but may provide ideas that could be incorporated into other models of working. A task characteristic of existential psychotherapy would be the moment-to-moment, here and now tracking of the clients and therapists experience of the relationship. The goals of existential therapy are high, not only to alleviate symptoms but to facilitate personal growth and character change (Yalom, 2001). It is perhaps important to use the concepts of this approach to guide the therapeutic process of relationship building that can be carried forward into different models of working with clients.



## CONCLUSIONS

*'That's what a therapist has to do...to create a feeling that you can trust them and that they can help you.'*

(*'Anne's story'* in Greenberg, 1999, p.16).

Dependent on theoretical standpoint, the therapeutic relationship has been seen as either a necessary and sufficient vehicle for change or an integral component of therapy but one which is not adequate for change on its own. Existential psychotherapy places great importance on the relationship, seeing it as the core of therapy and the essential condition for therapeutic change. Within family therapy, the two schools view the relationship differently but use it as a vehicle for affecting change, secondary to the 'therapy' itself. Within a CBT framework, the relationship is viewed as a vital part of getting to the 'true' work of the therapy, monitoring and countering maladaptive cognitions.

In reality, the efficacy of the therapeutic relationship in producing a positive outcome for the client probably falls somewhere between the two viewpoints; it is a vital ingredient of the therapy backed up by therapeutic tasks. What does appear to be the case, according to the research thus far is that it is the relationship or alliance that is more important than the therapeutic model implemented in effecting change with clients. The research cited here clearly points to the importance of a facilitative environment for therapy to take place but in numerous meta-analyses no one therapy has been shown to be any more effective than another (Hovath & Greenberg, 1991; Safran & Muran, 2000). This seems to be related to certain core conditions and non-specific factors common to all therapeutic approaches (Hazler & Barwick, 2001).

Until further research is produced and more is known both about the function of the relationship across and between different approaches, it would seem practical for clinical psychologists to utilise a transtheoretical conceptualisation of some of the key components of the therapeutic relationship to inform their way of developing alliances with clients. Bordin's (1979) model seems ideal for use

here and has been adopted recently by commentators from opposing orientations as a useful way of conceptualising the alliance (Johnson & Wright, 2002; Safran & Muran, 2000). Measures based upon the model also exist to facilitate research (Pinsof, 1994).

The mixed picture of the research illustrating the importance of the therapeutic relationship has some implications for current practice. While the usefulness of a good working alliance is no doubt widely accepted by therapists, there appears to be variability in how the relationship is formed and used across approaches. Regardless of orientation, building a therapeutic relationship should be the first major task of therapy, which needs work to maintain it throughout treatment (Bergin & Garfield, 1994). While this skill of forming and building effective relationships with clients may develop naturally with experience, it seems to be a skill that would benefit from formal teaching. Burns and Auerbach (1996) claim that training is important to help therapists to learn when to leave technique aside and focus on the relationship, and learn how to deal with ruptures and impasses that occur in the relationship. Transtheoretical training, perhaps using Bordin's (1979) conceptualisation would be of value.

With the drive within the NHS for brief and cost effective treatments for symptom relief, it seems like the importance of the relationship in psychotherapy is overlooked in a focus on effective techniques. Longer treatments that focus on relationships, like an existential approach, may not be favoured, despite their being little to differentiate therapy effectiveness (Horvath & Symonds, 1991). It may be important to develop alliances more quickly. Techniques that directly focus on the positive aspects of therapy, which may not be appropriate in longer-term therapy, may need to be adopted, such as demonstrating confidence and enthusiasm for change (Orlinksy & Howard, 1994).

Finally, if we as therapists use a model like Bordin's (1979) to inform our thinking in developing relationships with clients, it is likely we will be able to create an environment that makes our clients feel like Anne does in the quote above. Without further research on the therapist and client variables of what makes an effective therapeutic relationship, this may be a good enough start.

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## **Written Exercise 2 Child & Adolescent Mental Health**

**Discuss the construction of 'psychopathology' in children and adolescents:  
AD-HD & Conduct Disorder**

## **Child & Adolescent Mental Health**

### **Discuss the construction of 'psychopathology' in children and adolescents: AD-HD & Conduct Disorder**

*"Fancy thinking the beast was something you could hunt and kill"  
(The Lord of the Flies' William Golding)*

William Golding's novel *The Lord of the Flies* illustrates the difficulties inherent in naming the darker side of our nature. As such the novel captures many of the salient issues involved in classifying, quantifying and pathologising the more problematic behaviours of childhood. The young male protagonists of the novel have to survive alone, without adults, after being stranded on a remote desert island. The 'beast' referred to is a mythical creature, a manifestation in the boys minds of something dangerous within them that must be controlled, and they represent this as an animal lurking on the island. The 'Beast' mocks the boy's fear of what they do not understand and what they cannot track, hunt and put an end to; the 'savage' parts of themselves. 'The Beast' considered in this essay will be what we term Attention Deficit-Hyperactivity Disorder (AD-HD) and Conduct Disorder (CD). These are the darker aspects of childhood behaviour that we seek to make sense of and once clinicians put a name to them, we attempt to call forth into existence.

*"We've got to have rules and obey them. After all we're not savages."*

#### **AD-HD & Conduct Disorder – diseases for our time?**

The trainee's interest in the debate surrounding AD-HD was generated during the core child placement. A frequent point of debate within the CAMHS service that the trainee worked within was the way in which to manage referrals and cases presenting with AD-HD symptoms, including associated conduct problems. The volume of referrals within the service framed in terms of difficult behaviour, home or classroom-based problems was also noticeable by comparison with referrals for other disorders. It was interesting to debate within the team and in supervision the possible explanations for the frequency of the referrals; could it be that the 'disorder' of AD-HD is on the rise

or might a cultural change in the way we think about childhood behaviour account for some of the prevalence. In other words, might AD-HD and CD be culturally constructed phenomena?

The debate surrounding AD-HD is very topical at the moment, there is much coverage within the press and NICE draft guidelines (2005) are currently in preparation, but the debate is not a new one. Perhaps in the face of a lack of concrete evidence for a definite biological basis and perhaps due to the fact AD-HD largely concerns a population with a limited voice of its own, it wages on and tends to attract heated attention. From reviewing the literature it also appears to generate polarised views; a purely biological explanation or a critical psychiatry viewpoint. This in itself limits the options available for understanding the phenomenon and is perhaps counter-productive in constructing a balanced and informed debate to present to healthcare professionals, parents and children.

This essay will attempt to review a more balanced, bio-psycho-social model of AD-HD and CD that attempts a dialogue between a medical model and a psychological understanding of hyperkinetic and anti-social child behaviour. The diagnostic criteria for the disorders will not be discussed in detail, and AD-HD and CD will often be referred to together. This is because the wider arguments about the disorders are similar and the disorders share more features than not. An outline of the how the disorders are defined will be presented below, followed by a discussion of why and how they have come to be categorised in this way.

### **Definitions and the extent of the 'problem'**

In terms of DSM IV and ICD-10, AD-HD or Hyperkinetic Disorder is characterised by clusters of symptoms around three core areas of hyperactivity, impulsivity and inattention. AD-HD has been sub-typed according to:

- the pervasiveness of clinical features across settings (i.e. symptoms will be present both at home and school),
- the presence of both inattention and hyperactivity

- and the presence of CD (Barkley, 2003).

Severe hyperactivity is felt to be a strong predictor of poor psychosocial adjustment (Schachar & Tannock, 2002). Severely hyperactive children show the clearest changes on executive function tests and are felt to respond best to stimulant medication (Barkley, 2003).

Co-morbidity between AD-HD and CD indicates greater severity. Children with this presentation are felt to be less responsive to treatment and to have a much poorer prognosis (Taylor et al, 1996). CD is defined as a *“repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or rules are violated”* (DSM-IV-TR; APA, 2000). Three or more symptoms from a list of fifteen behaviours classed as aggressive, disruptive or anti-social have to be present for a year in order for a diagnosis to be made. Both disorders are more common in boys, with AD-HD being frequently found pre-adolescence. With CD, there are thought to be two presentations, life-course persistence and an adolescence-limited subtype (Moffitt, 1993 in Richters & Cichetti, 1993).

The prevalence of AD-HD varies widely dependent on the stringency of the diagnostic criteria applied. The literature documents rates from one to twenty six percent (Timimi & Taylor, 2004). A review by Hinshaw et al (1998 in Timimi, 2002) based upon UK criteria, which demands the cross-situational stability of symptoms, found prevalence to be one percent. With the prevalence for CD, the range is still wide, between one and ten percent (Hinshaw & Lee, 2003). Prevalence rates for these disorders are confounded by the fast rate of change in their definition. The definition of AD-HD has changed twice since 1980 with each revision producing a higher prevalence rate, which makes comparison amongst studies difficult (Timimi, 2002). For CD, recent definitions are much more stringent (Hinshaw & Lee, 2003). Developmental progressions across the disorders may also account for some of the variation (Lahey & Waldman, 2003).

More definite statistics exist for Ritalin, the psycho-stimulant drug of the methylphenidate (MPH) class prescribed for AD-HD. In the USA, the estimates make worrying reading with some

suggesting up to six million children are diagnosed with ADHD and on medication (Timimi, 2005). MPH prescription rates are on the rise in the UK also, with the figure being recently put at over 420,000 per year (NICE draft scope guideline, 2005; Boseley, 2006). AD-HD has been linked in the UK press with the benefit system so figures such as these create moral panics. Likewise, this is the case for reports concerning the Anti-social behaviour orders (ASBO's), linked to children with CD (Grisso, 2004).

### **AD-HD and CD: more similarities than differences?**

Despite being diagnostically classed as separate disorders, AD-HD and CD have much in common. It is widely acknowledged that up to three quarters of children diagnosed with AD-HD also meet the criteria for another disorder, most notably that of CD (NICE, 2005; Timimi & Radcliffe, 2005; Richters & Cichetti, 1993). This has led some commentators to go so far as to argue that they are not discreet disorders at all (Timimi, 2002; Timimi & Radcliffe, 2005). It is easy to see the reasons for this, in shared deficits of functioning in the areas of sustained attention, poor impulse control and lack of foresight (Hinshaw et al, 1998 in Timimi, 2002). Children with a co-morbid diagnosis of CD and AD-HD demonstrate significantly greater deficits in functioning in all the relevant domains (Biederman, 1991; Hinshaw, 2001).

An association between AD-HD and offending has also been demonstrated. In studies conducted within prisons in the USA, Sweden, and Norway there are reports of between twenty two and sixty seven percent of inmates having been diagnosed with AD-HD in childhood and further reports of up to thirty percent remaining symptomatic as adults (Grisso, 2004). In 2002 in the R. vs Blackender trial of a sixteen year old accused of murder the judge accepted a charge of manslaughter on the basis of diminished responsibility due to the boy's ADHD diagnosis. There are numerous reports on parent and anti-psychiatry websites convincing linking school shootings in the USA with the prescription of drugs of the MPH type (see <http://www.adhdfraud.org>).

While working within a CAMHS service the trainee was party to team discussions regarding the increasing pressure from the justice system to prescribe MPH type drugs for adolescents with a

history of offending. The trainee observed the implications for the way in which CAMHS services may potentially have to operate, as medicating 'treatment' services rather than multi-disciplinary assessment and intervention services. These demands can neglect the often complex family and difficult social circumstances existing for these children.

### **Are AD-HD and CD under-recognised neurological disorders?**

Eight years ago the National Institute of Health claimed that *'there are no data to indicate that ADHD is caused by a brain malfunction'* (NIH, 1998 cited in Timimi & Radcliffe, 2005). The evidence produced since then has done little to clarify this (James, 2006). The neurobiological evidence estimates the heritability in twin studies at between sixty-five and ninety percent (in Barkley, 2003). The risk has been suggested to increase by three to five times in first degree relatives of people with ADHD and it is assumed that much of the familial association is due to genetic inheritance (Taylor et al, 1996). However, some argue that the heritability findings are so tenuous and the symptoms so ubiquitous that a likely conclusion might be that all children potentially fit the diagnosis, particularly if they are male (Timimi, 2002).

Neuro-imaging studies have indicated some functional brain changes associated with hyperactivity (Barkley, 2003; Taylor et al, 1996) but there are flaws in these findings. The neuro-imaging research has been conducted on children already on MPH medication and to date, age matched control groups have not been used (Leo & Cohen, 2003). The studies have small sample sizes and inconsistent results. In this way the rigour of research is open to question and interpretation (Joseph, 2000; Timimi, 2002; James, 2006). Timimi (Timimi & Taylor, 2004) goes as far as to liken likens the search for neurobiological evidence for AD-HD to phrenology. Timimi insists that the high levels of co-morbidity throw doubt on the specificity of the diagnosis, as this suggests shared genetics between AD-HD and CD and other externalizing behaviours, not specific to AD-HD.

However, despite the polarisation of the current debate, it is important for clinicians not to underestimate the implications for severe hyperactivity and impulsivity. There is evidence strongly

predicting negative outcomes for these children, across a range of dimensions. Taylor (Timimi & Taylor, 2004) argues that while the over-treatment of AD-HD may occur in the US, in the UK under-treatment is more likely. This highlights a problem in identifying, referring and treating children with severe hyperactivity and impacts on the prevention of some of the associated long-term outcomes. Taylor again makes the point that differences in brain structure and function have been demonstrated in children with high levels of hyperactivity. However, it is important to understand how these observed changes in structure and function predispose the child to develop ADHD and how these factors interact with the environment.

CD raises its own issues and debate. The diagnosis of CD using DSM throws light on the flaws inherent in psychiatric diagnostic systems. In the same way as the boys in *'The Lord of the Flies'* give a name to the Beast, assigning a diagnostic label automatically assumes the category exists, is valid and suggests the behaviours associated can be explained (Richters & Cichetti, 1993). To obtain a diagnosis of CD a child need only have three symptoms from a list of fifteen. This results in children with the same diagnosis, yet with very different presentations, as they may not share a single symptom (Richters & Cichetti, 1993). Clinically, this would seem to render the diagnostic label of CD relatively meaningless. CD might well be an example of a 'medicalised social problem' (Timimi, 2002).

*"Which is better, law and rescue or hunting and breaking things up?"*

### **Problems and limitations of pathologising childhood behaviour**

Assigning diagnostic labels to children presents ethical dilemmas and can have potential harmful effects. Kutchins and Kirk (1997) point out that we tend to make negative statements about those who have less power. DSM-IV is a classification system designed with adult disorders in mind. It does not lend itself to behaviours that may be predominantly defined by others as opposed to those that are self-reported or directly observable. Attention and conduct problems are of the few child-centric disorders within DSM-IV and these rely heavily on evaluation by others. The question has

to be asked that if children had equal power would we be diagnosing these behaviours at all (Timimi & Radcliffe, 2005).

### **The problem with medicating AD-HD**

As mentioned previously, prescription rates for MPH type drugs have soared in recent years in the UK. Treating childhood behaviour in this way is extremely profitable for the pharmaceuticals industry. Ritalin has made headlines recently and there are numerous concerns about the use of MPH in children. It is widely acknowledged as a drug of dependency, comparable to amphetamine substances like cocaine. The recently reported deaths (Boseley, 2006) have led to a call in the USA for a “black box” warning to be put on MPH drugs (Tanne, 2006). Parent and lobby groups have had longstanding concerns regarding the widespread prescription of Ritalin for children. (see <http://www.ritalindeath.com>).

The NICE guideline (2000) recommends prescribing MPH only for severe ADHD. The guideline states that the drug should only be given to those aged over six, as part of a comprehensive treatment programme that involves support for parents and teachers. They advise that treatment be discontinued on improvement of symptoms. However, they also advise that lack of therapeutic resources or adequate support should not preclude a child from receiving medication if this is felt to be appropriate. It is argued that this gives the green light for prescription alone and certainly as a first step, at the expense of psych-social interventions (James, 2006). The Scottish Health Executive were so concerned about the escalation of rates of Ritalin prescription (a tenfold increase in Ritalin prescribing over eight years), that in January 2005 they launched an inquiry into ADHD & Ritalin, the findings of which are yet to be made available ([www.psychminded.co.uk](http://www.psychminded.co.uk)).

A Recent meta-analysis of randomised controlled trials for the effectiveness of MPH showed that the trials were of poor quality, with evidence of publication bias. The demonstrated largely inconsistent findings regarding the short term effects of the drug and very weak evidence to show longer term effects beyond four weeks (Schachter et al, 2001, cited in Timimi, 2002). However,



some short term efficacy has been demonstrated, using global ratings of children's behaviour by parents and teachers (in James, 2006).

The weakness within the evidence base does suggest that in deciding treatment for AD-HD, clinicians may all too readily decide upon medication in the first instance. This was the trainee's observation when reviewing referrals within the CAMHS service; medication appeared to be the first choice of intervention. Some argue that the function of Ritalin is largely one of social control (Baldwin, 2000), prescribed to bring about change in the short term and not to reduce any identifiable hazard to health. Reports state that MPH shows similar mechanisms of action in healthy children and adults, lending further support to the criticism of AD-HD as a discreet entity with underlying neuro-biological deficits (Breggin, 2002). Furthermore, research indicates drugs like Ritalin suppress spontaneous and social behaviours while promoting more ritualistic behaviours which may make children more manageable in structured sits (Breggin, 2002).

There remains an argument for prescribing MPH in some instances. Given that severe hyperactivity is such a strong predictor of poor psychosocial adjustment (Timimi & Taylor, 2004); withholding the drug is felt to have long-term repercussions. It is argued that those not diagnosed and medicated are more prone to accidents, conduct disorder, psychiatric problems in adolescence, educational and occupational failure, and a lack of constructive occupations or satisfactory relationships (Barkley, 2003). However, a review of non-pharmacological approaches Hinshaw et al (1998; in Timimi, 2002) would suggest that there are effective alternatives to medication and that these should be more widely available and be given more attention in research.

### **Is the medical model too simplistic?**

Timimi (2002; 2005) suggests that the way we make meaning and respond to the biological fact of children's immaturity is highly culture specific and there are many cultural factors that can adversely affect mental health. Within a purely medical framework, the AD-HD diagnosis is a simplistic misrepresentation of the problem as it ignores the complex interrelationship between the child's

psychological and physical world, their parents and the wider community. Timimi and others argue that labelling AD-HD as a disease shuts out consideration of the broader context and allows disengagement from our social responsibility to raise well-behaved children. It reduces medical practitioners to agents of social control, and disempowers parents by creating unnecessary dependence on doctors. Ultimately this may stigmatise children, leading to social isolation and may reinforce parental attribution of the child's difficulties to a medical problem rather than highlight family factors that may need attention (Timimi & Taylor, 2004).

A bio-psycho-social model of viewing disorders such as AD-HD and CD has been proposed as it offers a dynamic view of childhood, which moves away from the search for signs and symptoms towards a fuller understanding of the difficulties a child may present with (Carr, 1999). The research indicates that biological influences are a factor in the disorder but on their own add little to the understanding of how neurology, the within-person and contextual factors interact to influence the presentation and severity of symptoms we label AD-HD and CD.

### **A systemic and cultural perspective: what is 'normal' childhood behaviour?**

The contribution and associations of wider systems factors to our understanding of AD-HD and CD cannot be ignored. In data recently published by the Office of National Statistics (2003) the persistence of conduct disorders was found to be associated with the child having special educational needs, having step-children in the family, being frequently shouted at and poor maternal mental health. In terms of family and household characteristics, the rates of persistence of conduct disorder were also associated with having widowed, divorced or separated parents, living in rented accommodation and having a gross family income of less than three hundred pounds a week. Discord within the family had significant associations with the persistence of CD, as did the poor psychological well-being of mothers. There is growing evidence that exposure to trauma and abuse has significant associations with the development of the symptoms of hyperactivity and inattention and conduct problems (Ford et al, 1999; 2000).

In the Mental Health of Young People in GB report (2005) parental employment was found to be linked to hyperactivity and attention problems; the proportion of children with hyperkinetic disorders living in households where both parents were unemployed was twice that amongst children with no disorder. Children with hyperkinetic disorders were more likely than other children to live in a household in which someone received a disability benefit

It is difficult to ignore strong social factors such as these, but how might they impact on the presentation of attention and conduct problems in the child? It is argued that ordinary child activity when coupled with frustration can look like hyperactivity; boredom and loneliness in the child can look like inattention (Timimi, 2005). If children live in poverty, on family incomes of below three hundred pounds per week, many will not be able to afford pleasurable outings or holidays. Within education, the current system places increasing pressure on children to succeed academically, with exams and testing as early as age four. This may set the child up for an early pattern of failure, with league tables serving to reject children rather than support them. When we place labels such as AD-HD or CD on a child, these social problems seem to fade into the background, seemingly becoming less important in the way clinicians view children's lives.

Cultural expectations of children can play a large part in those we see presenting at clinic and can impact their subsequent diagnosis and treatment. Children are dependent on the views and observations of others to determine their 'caseness' (Taylor & Timimi, 2004; Timimi, 2005). It has been found that cultures vary widely in their tolerance of children's behaviour. In a study using the Connors rating scale, it was found that Chinese and Indonesian clinicians gave consistently higher hyperactivity ratings than did their Japanese and American colleagues when shown standardised videotaped vignettes of children participating in both group and individual activities (Mann et al, 1992). Hackett and Hackett (1993) found that Gujarati speaking parents had more rigorous and clearly defined expectations of child behaviour and tolerated fewer behavioural difficulties. As a result their children exhibited fewer behavioural problems. The same behaviour is viewed differently when seen within different cultural contexts.

Differences in rates of hyperkinetic and conduct problems are also found within more micro-systems. Schools and families within a cultural group can vary enormously in terms of tolerance

and expectation. To illustrate this, Reid et al (1993 cited in Timimi, 2005) cite several studies which report that specialist teachers in schools for emotional and behaviour problems tend to be more tolerant of misbehaviour. They also judge their student's behaviour as less deviant than their mainstream class teachers.

What constitutes a sign or symptom depends on cultural and sub-cultural values. With government initiatives such as anti-social behaviour orders, it is clear that our society has limited tolerance for what we would term 'deviant' behaviour. As well as differences cross-culturally, intergenerational factors exist. Differing attitudes of parents, grandparents and clinicians to acceptable behaviour will inevitably influence diagnosis. As there is no specific cognitive or medical tests for AD-HD and CD all of these factors will ultimately influence prevalence. This has been corroborated by reports of a twenty fold difference in diagnostic rate reported between the USA and UK (Taylor & Sandberg, 1984 in Timimi, 2002).

There can be little doubt that family and cultural factors play an important role in both the structure of the child's environment and in the perception, manifestation and treatment of childhood psychopathology (Dwivedi & Banhatti, 2005; Richters & Cichetti, 1993). The cultural interaction between the child's world and the adult world may sometimes be in conflict. For example, a less able child in a family whose parents attach particular importance to academic success, or a child who is expected to understand and cope with the complexities of adult relationship break up. This is where thorough and multi-modal assessment and formulation is needed and clinical psychologists have much to contribute to the debate and to the teams they work within.

*“Maybe there is a beast...What I mean is...maybe it’s only us.”*

**Do we pathologise hyperactivity, attention and conduct problems or try to understand them in context?**

In Golding’s *‘The Lord of the Flies’*, some of the children recognise the ‘Beast’ as something within themselves that must be withheld. One of the ways in which they attempt to do this is to lay down rules and attempt to organise their micro-society. Diagnostic criteria and the medical model can be seen as a way to attempt to tame the untameable; to create global, simplistic and precise definitions to attempt to understand concepts of childhood behaviour which are hugely complex, varied and culture-specific. AD-HD and CD are both examples of where the limits of the diagnostic system are evident and can be usefully discussed. It is disappointing that recently, with the consensus statement on AD-HD (Barkley et al, 2002) commentators have attempted to prematurely close down the debate regarding the merits of diagnosis and drug treatment of AD-HD.

The medicalisation of attention, hyperactivity and conduct problems has its drawbacks and its limits. It shifts the responsibility and locus of control for a child’s behaviour from within themselves to outside agencies and ‘pills’ (Baughman, 1993). It sets up a stigmatised belief that child is physically abnormal in some way and can serve to displace family difficulties onto the child, without looking at the interrelationships within the family and the systems. Diagnoses of AD-HD and CD can limit professional responsibility and can push teachers, clinicians and medical practitioners into self-doubt about their capacity to teach and care for the children they look after (Timimi, 2002; 2005).

However, there is evidence to hypothesise that a proportion of children displaying hyperkinetic and conduct problems do suffer from an underlying dysfunction. It may be that potential dysfunctions with neuro-biological origins play an important role in predisposing some children towards chronic hyperactivity problems or anti-social behaviour and may play a role in maintaining the symptoms. There are plausible theoretical and empirical reasons to assume that there are other social and environmental pathways to these behaviours as well. Neuro-biological theories, such as those

highlighting the impact of trauma and abuse on the developing brain (Terr, 2002, van der Kolk, 1994 in Dwiverdi & Banhatti, 2005), can be used to support the development of non-pharmacological interventions that the Hinshaw et al (1998 in Timimi, 2002) review recommends. Neuro-biology can also help to challenge wider cultural beliefs that difficult or deviant behaviour in children is always their own fault or a product of poor, neglectful parenting.

Psycho-social interventions are demonstrating good results. Projects such as the Family Well-being Project in Birmingham and the Parent Adviser Scheme in Tower Hamlets (Harris, 2005; Buchan et al, 1998) have been set up. These projects support families whose children have behaviour problems, and have included employing and training Gujarati speaking workers. To date the results have been positive, with a reduction in the children's behavioural difficulties reported by parents, and improvements in the children's language development. The projects have also demonstrated global improvements in parental coping factors, including enabling parents to communicate more effectively with the clinicians involved in their child's care and giving them access to information to the services available to them (Bandak, 2005; James, 2006).

There is a lack of services like this and a paucity of research on contextual factors which needs to be addressed, in conjunction with continuing research into the neuro-biology of these disorders. This will help to move away from a polarized debate which limits a fuller understanding. It is evident that systemic, cultural and environmental factors are as important to the debate and contribute to the conceptualization of AD-HD and CD as well as helping to guide interventions with these children.

*'The Lord of the Flies'* highlights many of the dilemmas inherent in the way we have come to construct and pathologise children's behaviour, Golding only gives the boys stranded on the island two options of how to be; saints or savages. By constructing childhood behaviour in the way of medical classification systems such as DSM-IV, we too restrict and constrain the options available to children; they can be 'normal' or they can be pathologised or criminalised. In this way, childhood behaviour is not seen on a continuum and individual and external influences are not taken into account. Worse still, acquiring these labels is not a transient process, as AD-HD and CD are not

framed as disorders one grows out of but have poor prognoses for adulthood. It is important to deconstruct our way of viewing childhood behaviours, in order to understand the implications for the way we 'treat' children. A more individualised conceptualisation of childhood behaviours like ADHD and CD, which takes into account environmental, contextual and systems factors, is needed in order to guide interventions with these children and their families.

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# **SMALL SCALE SERVICE-RELATED RESEARCH PROJECT**

**An Evaluation Of A Six-Week Course For Close  
Relatives Of People In The Early Stage Of Dementia**

**Diana Maria Sporle**

## **Abstract**

In this audit, a six-week psycho-educational group for the carers of people with a diagnosis of dementia was evaluated. Measures of depression, anxiety, strain, self-efficacy and knowledge of dementia were used to this end and were administered prior to and just after the six-week group. Feedback questionnaires were also administered after the group to obtain qualitative information on the carers' experiences.

Five participants completed the intervention, all of whom were close relatives of people with dementia and had identified themselves within the caring role. Mean levels of anxiety and depression decreased post-group and mean scores of self-efficacy and dementia knowledge improved. Measures of perceived strain showed a slight increase after the group. The individual participants' scores are discussed. Qualitative feedback was positive and encouraging, indicating that the group was well received by the carers.

The findings are discussed in terms of offering the group as part of a standard service for carers, improving access to the group in order to offer the service as soon as possible following diagnosis.

## **Introduction**

The following audit took place within an Older Adult CMHT within the south east of England. It is a preliminary study of a psycho-educational group, the "Great Minds Think Differently" group, targeted at carers and close relatives of people with dementia. Dementia is a syndrome characterized by progressive decline in memory, communication, reasoning and learning abilities. It usually manifests itself in behaviour change and loss of functional ability. In the later stages dementia is associated with physical features such as incontinence and weight loss (Thompson et al, 2003).

Informal caregivers can be defined as people who look after family, partners or friends that need assistance or are incapacitated due to illness or disability. The care they provide is unpaid and often requires the performance of tasks that may be physically, emotionally, socially and financially demanding (Carers UK, 2005).

### *The picture of caring in the UK*

The 2001 Census shows that 5.2 million people provided informal care in the UK, with just over 1 million providing over 50 hours of care per week. Government figures estimate that there are 3.3 million women and 2.4 million men providing informal care in this country. Most carers are between the ages of 45 and 64 almost all of whom care for a close relative. It is estimated that nearly half of all carers will look after someone over the age of 75 (DOH, 2005, Maher & Green, 2002).

It is clear that a large number of people provide significant levels of informal care, which is proposed to play a vital role in delaying hospitalisation and keeping people with dementia in their homes and communities. The level of input that carers provide has begun to be acknowledged. Recent legislation and guidelines seek to recognise and support the work done by carers and introduce initiatives that will support them in their role (DOH, 2004, 2005). Under the Carers (Equal Opportunities) Act 2004, statutory services have a duty to offer carers a separate assessment of their needs and are obliged to inform carers of this right. The carers' wishes for employment, leisure and training opportunities should be considered and social services now have power to make use of other bodies in the provision for carers. Carer led support and pressure groups support the move to provide increased resources for carers, however they argue that this support is inconsistently applied and can vary across geographical area (Carers UK website).

### *The emotional costs of caring*

It is widely accepted that many carers suffer inequalities in mental and emotional health as a result of their role (Depp et al, 2003; Charlesworth, 2001; Wood et al, 2003). Caring for an older relative with dementia typically involves dealing with challenging issues, such as behavioural disturbance and increased responsibility for physical needs, such as administering medications. These are factors in addition to the psychological consequences of adjustment to the relationship changes dementia may bring. Many carers need to cope with issues of grief and loss inherent within a progressive condition (Charlesworth, 2001). Carers are twice as likely than non-carers to report high levels of psychological distress, which can include anxiety, depression, and loss of confidence and self-esteem (Carers UK). Carers are also at risk of significant social exclusion due to the demands and burdens of caring. Most carers report the additional pressures of having to invest considerable time and money in support of their role. Those providing substantial amounts of care are statistically more likely to be either out of work or working reduced hours (Depp et al, 2003).

With appropriate support, carers are less likely to become marginalized while they care for someone and will be more able to return to work when their caring role ceases. The organisation Carers UK make the point that carers in good health are more willing and able to provide and cope with the demands of care giving. These are some of the issues that national policy documents are attempting to address and the health and social services are attempting to make provision for.

### *Research on interventions for carers of people with dementia*

Interventions targeted at carers and their needs have varied in mode of delivery; group or individual, and in the content of the interventions, such as social support or cognitive strategies. Two key systematic reviews have been conducted (Cooke et al, 2001; Pusey & Richards, 2001). Pusey and Richards (2001) found that interventions that included problem solving, behaviour

management and educational components were more effective than those relying on emotional support alone. However, they found much methodological weakness within the research and concluded that there was limited evidence to support any of the interventions in terms of the mode of delivery.

The review by Cooke et al (2001) focused predominantly on the content of the intervention and indicated that interventions for carers are most effective if they contain a social element or a combination of social and cognitive components, such as problem solving. Recommendations based on these reviews suggest that interventions should be more individually tailored to needs of the carer in order to maximize effectiveness. This is thought to be specifically important in terms of gender (Toseland & Rossiter, 1989), the type of dementia and the relationship of the carer to the person with dementia (Knight et al, 1993).

In terms of what carers want to enable them to continue to care, the indicators are that having access to respite services, increased social support, being in receipt of satisfactory services and information and a recognition of their role are identified by carers as being helpful to them (Twigg, 1992).

#### *The efficacy of psycho-educational groups for carers of people with dementia*

Psycho-educational groups are the most common mode of delivery for interventions targeted at carers of people with dementia (Cooke et al, 2001; Pusey & Richards, 2001). Psycho-educational interventions are typically structured and time-limited, based upon CBT approaches. Groups of this nature have clear aims and objectives, usually focused upon skill acquisition (Coon, Rider, Gallagher-Thompson, & Thompson, 1999; Depp et al, 2003). The typical focus of these interventions is to provide information about dementia, strategies for self-care and stress management techniques (Depp et al, 2003). Depression and anxiety in the carer can also be the



focus of some interventions (Aranda & Knight, 1997; Gallagher-Thompson et al, 2000). Some psycho-educational groups focus on increasing the skills of care giving in order to enhance the quality of life for the person with dementia and facilitate caring (Charlesworth, 2001).

There has been empirical support within the literature for the effectiveness of psycho-educational groups over support-based groups (Depp et al, 2003; Knight et al, 1993). Findings have indicated that psycho-education is more effective in reducing carer depression, increasing knowledge and self-esteem than support groups alone (Sorensen, Pinquart, and Duberstein, 2002). Some studies have also shown that psycho-educational groups can have the added effect of delaying hospitalisation for the people cared for and can affect the cost of care giving, in terms of increasing knowledge regarding access to benefits and assistance available (Mittleman, 1993). Important qualitative findings have also been noted in psycho-educational groups for carers; specifically carers report that attending groups decreases their sense of isolation and increases confidence (Thompson & Briggs, 2000). However, it remains to be demonstrated whether psycho-educational group interventions are more effective than individual interventions (Pusey and Richards, 2001; Thompson et al, 2003).

#### *The clinical setting – history & aims of the ‘Great Minds Think Differently’ group*

The six-week group was developed in order to provide a time-limited, psycho-educational service to carers of people who had recently received a diagnosis of dementia within the catchment area of the Older Adult CMHT. No such service is currently provided in this area of the country. This would appear to be at odds with what has been recommended by key government policy (NSF Older People, 2001). Recognition of the lack of local information provision and services for people diagnosed with dementia and their carers culminated in the Older Adult CMHT and the local branch of the Alzheimer’s Society (AS) to work jointly on developing this service.

The aims of the group were to provide information and support for the caregivers following a diagnosis of dementia and to encourage mutual support between group participants. The aims for the service were to learn more about the specific problems and needs of carers of people with dementia by the evaluation of the intervention using quantitative and qualitative methods.

The objectives of the audit were two-fold:

1. To measure the effectiveness of the group upon factors associated with psychological adjustment in carers of people with dementia including: anxiety, depression, strain, self-efficacy and knowledge of dementia.
2. To establish whether participants' valued the psycho-educational group as indicated by their general satisfaction with the service received.

## **Methodology**

### *Design*

A pre-test – post-test design was employed measuring participants' anxiety, depression, strain, self-efficacy, knowledge of dementia, and general satisfaction across the six-week psycho-educational group.

Following consultation with the relevant Trust's Research & Development Committee, this study was considered an evaluation of routine clinical practice and classified as audit. For this reason, ethical approval was not considered necessary for the project. The Clinical Audit & Effectiveness Group approved the submitted project proposal in January 2005. The study fulfils the criteria for audit as outlined in Wade (2005).

### *Format & content of the group*

This was a closed group, for carers of people with a recent diagnosis of dementia. The course took place over six weeks in January - February 2005. The format was broadly as follows:

Session	Topic	Discussion
1	Hello and welcome Introduction	Introduction to the group Signs & symptoms of dementia
2	Questions and concerns about memory problems	Facts about Dementia: different types of dementia, how memory works, different types of memory, external memory strategies
3	Challenges of dementia	Coping with stressful & difficult to understand behaviours
4	Coping with stress	How to recognise stress. Relaxation
5	How has your life changed? - Adjusting to new situations	Changes since the diagnosis of dementia, & ways of managing these changes
6	How services & different professionals can help	Talks from relevant local professionals and services. Closing the group – feedback.

Participants were provided with information sheets and handouts during the sessions and were asked to carry out some activities between sessions.

### *Participants*

Potential participants were identified by the Clinical Psychologist in the CMHT for Older Adults or by the local AS. All had a partner or first-degree relative attending a memory clinic or a day centre, or they were attending a carer support group. All participants (n = 6) were close relatives of people

who had recently received a diagnosis of Alzheimer's disease or vascular dementia. All participants committed to attend all or the majority of the six sessions of the group.

### *Procedure*

Potential participants for the group were invited to attend by the Clinical Psychologist or the AS Co-ordinator. They had the opportunity to ask questions about the group and were given a two-week period in which to opt-in. They were given a leaflet summarising the content of the course and were assured their decision would not affect any current or future services they would receive.

Once participants had opted-in, via telephone contact with the Clinical Psychologist or AS Co-ordinator, they were contacted by the Trainee Clinical Psychologist to complete the pre-group evaluation. They were informed that completion of the questionnaires was anticipated to take 45 minutes. During the meeting, the Trainee Clinical Psychologist reminded participants that a decision not to attend or to withdraw from the group would not affect any current or future services they received. The Trainee was available to answer questions concerning the group. Participants were asked to sign a consent form before completing the questionnaires for the pre-course evaluation.

In the final session of the group, participants completed the qualitative satisfaction questionnaire. Then, in the week following the final session of the group, the Trainee met with the participants in order for them to complete the post-group evaluation.

All the information gathered was kept confidential, anonymous and securely protected in a locked filing cabinet held within the Clinical Psychology department. All questionnaire data was recorded on a database. A coding system was used and the names of participants were coded once consent to participate in the group was obtained.

### *Measures*

The service evaluation involved the completion of a questionnaire package by the carer of the person with dementia. All measures were routinely used with people for clinical and research purposes and are not known to cause discomfort or distress. They were as follows: -

- Hospital Anxiety and Depression Scale (HADS; Snaith & Zigmond, 1983).
- The Machin Strain Scale- Modified Version (Gilleard, 1987).
- Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1993).
- The Dementia Quiz (DQ; Gilleard & Groom, 1994).
- General satisfaction questionnaire (constructed for the purpose of this audit)

### *Ethical Considerations*

It was proposed that participants identified as needing extra input as a result of material generated in the sessions or following the end of the group would be offered an appointment with the Clinical Psychologist for the Older Adult CMHT.

### *Data Analysis*

Descriptive statistics were used to answer the audit questions, the qualitative information will be summarised.

## Results

In the sample of carers of people with dementia, the majority were over 65 (n = 5), 2 of the carers were husbands caring for their wives, 3 were wives caring for their husbands and one carer was a daughter, aged 47, who cared for her mother.

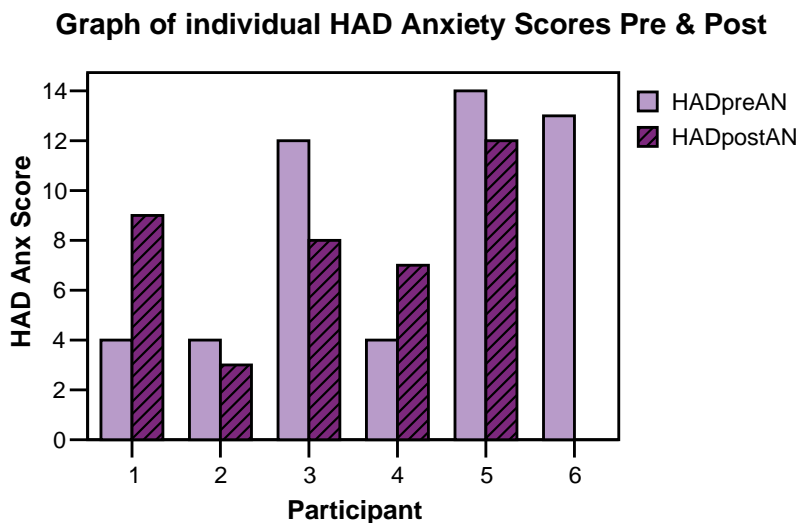
One participant had to make the decision to move their spouse into care towards the end of the group, and the husband of one participant died before the group was completed, and they subsequently disengaged from the study.

The carers mean scores on the questionnaires are shown in the table below:

Questionnaire		Pre group mean	Pre group range	Post group mean	Post group range
HADS	Anxiety	8.5	4-14	7.8	3-12
	Depression	7.5	0-12	6.4	1-11
Strain Scale		12.3	7-16	14.00	7-17
Self-efficacy		27.8	18-36	32.2	28-35
Dementia Quiz	Biomedical	2.8	2-4	3.8	2-5
	Coping	4.5	2-6	5.4	2-7
	Services	3.5	0-6	5.2	3-6

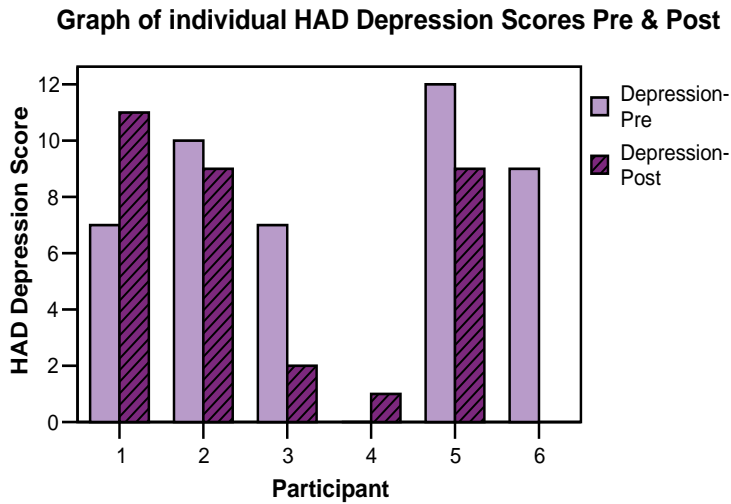
Mean levels of anxiety and depression were below clinical cut-offs for caseness and decreased following the group. There was a wide spread of scores across the range for anxiety and depression. Mean strain levels were high at baseline and increased following the group, however the range of scores remained consistent. Self-efficacy was generally low but increased following the group. There seemed to be a low degree of knowledge as measured by the Dementia Quiz, prior to the participants commencing the group, which seemed to be improved post-group. The individual participant's pre and post scores on the measures will be considered in more detail below.

**Graph 1: Did the group have an effect of the carer's anxiety scores?**



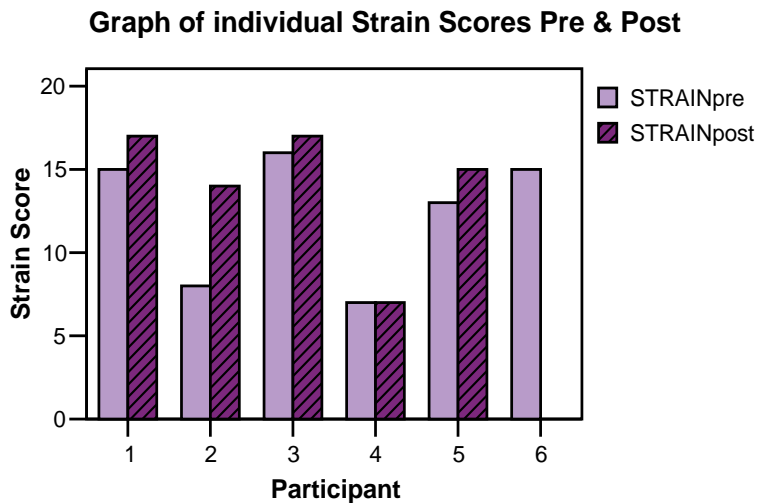
It is generally considered in the literature that a score above a cut off of 9.1 on the HADS Anxiety Scale is indicative of caseness for anxiety, which warrants further investigation. Graph 1 shows that for three of the participants anxiety levels on the HADS were indicative of clinical levels prior to the group. In the case of participants 3 and 5 this reduced following the group, although participant 5 remained in the clinical range. It seems that for two of the participants, anxiety levels rose following the carer's group, however, these remained at or below the cut off of 9.1.

**Graph 2: Did the group have an effect on the Carer's depression scores?**



A cut off score of above 7 on the HADS Depression scale indicates depression, which falls just outside the normal range. The majority of participants were at this level, or above prior to beginning the group. For three of the participants there was a reduction in reported depression scores, although this was only a difference of a point in the case of participant 2. Participant 1 experienced an increase in depression score of 4 points following the group.

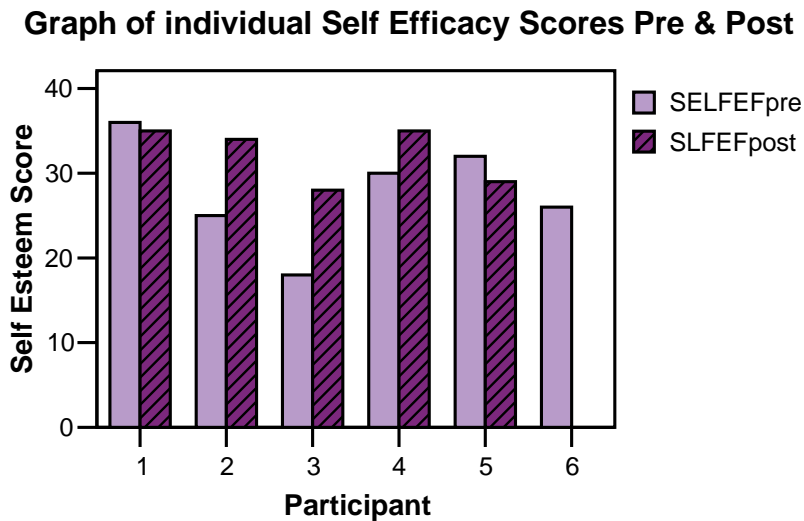
**Graph 3: Was there a reduction in the carer's reported Strain following the group?**





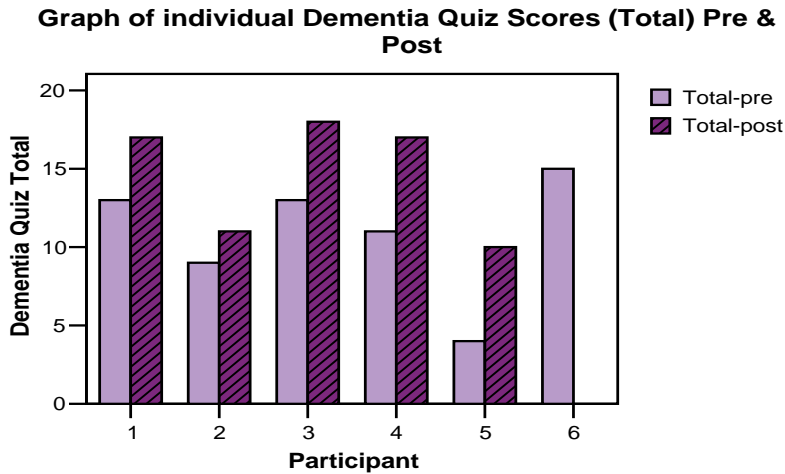
Strain scores for four of the carer's were at or above the cut off score of 14.6 at the pre-group assessment stage. In all cases, participants reported increased or similar levels of strain upon completion of the group. Although individual strain scores increased, the range of scores remained virtually the same.

**Graph 4: Did the group help to improve the carer's self-efficacy?**



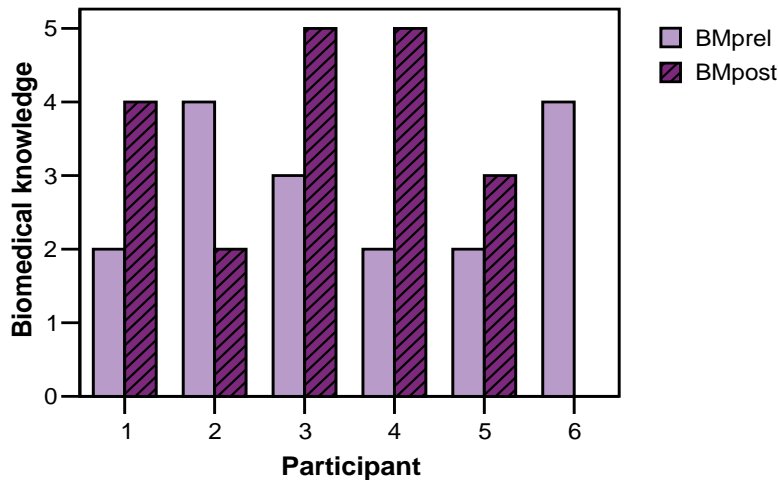
For some participants, self-efficacy scores increased quite significantly following the group and typically, these were the participants with lower self-efficacy scores prior to the group. Two of the participants experienced a slight decrease in self-efficacy score following the group but this was a drop of no more than 3 points on the scale.

**Graph 5: Did the group improve the carer's knowledge of Dementia?**

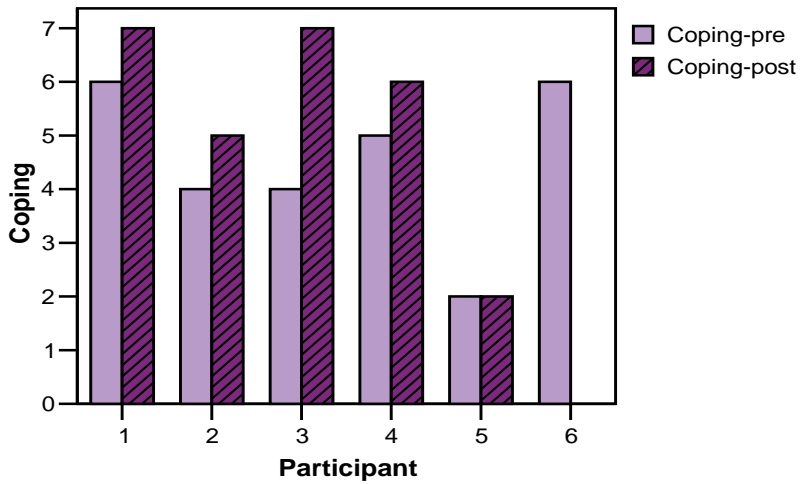


All of the participants demonstrated an increase in scores on the DQ overall, indicating an increase in their general level of knowledge about dementia. For most participants, this increase was relatively dramatic; an increase of 5 points or more. This was less so for participant 2 whose total score can be explained by their decrease in scores on biomedical knowledge (see DQ-Biomedical graph below). All participants demonstrated an increase in scores on most of the individual components of the DQ, the Biomedical, Coping and knowledge about services (see graphs below).

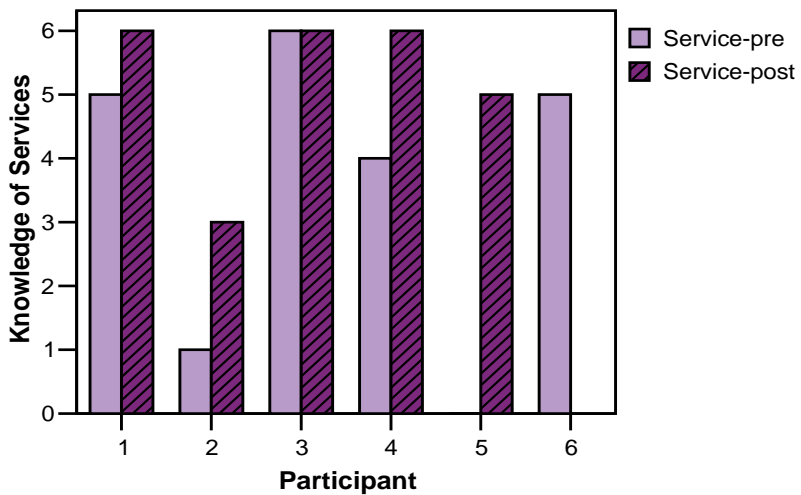
**Graph of individual Dementia Quiz Scores (Biomedical) Pre & Post**



**Graph of individual Dementia Quiz Scores (Coping) Pre & Post**



**Graph of individual Dementia Quiz Scores (Services) Pre & Post**



**Qualitative questionnaire feedback:**

The carers reported that they found the support received from the other participants valuable and found the information provision and behavioural management strategies particularly helpful.

## **Discussion**

### *Summary & discussion of the findings*

The findings of this audit indicate that being involved in the group was a positive experience for all of the carers, who commented that they had found the contact and support from the other participants invaluable. This is consistent with the research outlined in the introduction that suggests that emotional support is an essential component of any group psycho-educational intervention, and that sharing experiences in a supportive setting is powerful and helpful for many carers (Depp et al, 2003; Knight et al, 1993; Thompson et al, 2003).

In general, mean anxiety and depression scores decreased following the group. This may be a result of the group enabling participants to voice their concerns, reduce isolation and learn more effective ways to manage stress. However, this was not the case for some of the carers, whose scores increased following the group. This may be related to the stage of the person with dementia's illness or other factors present in the carer's lives, which the group was unable to address or that were difficult to capture via self-report measures.

It seems that the carers experienced an increase in measured strain following the group. This is perhaps unsurprising given the progressive nature of dementia and the individual challenges faced by the carers over the course of the group. One participant's spouse had a significant decline in health to the extent that respite care was arranged and two of the other carers' spouses experienced decline across the span of the group. These factors may also explain individual increases in anxiety and depression. Research indicates that strain and satisfaction for the caregiver can become reduced as the person with dementia's intellectual capacity decreases (Depp et al, 2003). It is worth bearing in mind that although the group was targeted at carers of

those in the early stages of the illness, the participants were varied in terms of their relative's type of dementia and stage of decline.

It is worth noting that this study did not attempt to measure the positive aspects of caring. Research of this nature indicates that for caregivers, strain, stress and satisfaction can co-exist and vary over time. A high proportion of carers express satisfaction, irrespective of their scores of care giving burden and the impact on their physical or emotional health (Andren & Elmstahl, 2005).

It is positive that scores on the self-efficacy scale increased following the group, indicating that the participants felt more confident in their ability to cope with the demands of care giving. It may be that by having contact and gaining support from others in a similar position reinforced a sense of confidence for them. It has been reported that carers often learn by a prolonged process of trial and error (Perry, 2002) and perhaps part of being involved in the group helped to facilitate this process and thus increase confidence.

Looking at the DQ scores, it seems that the group was effective at increasing the carers knowledge of dementia in each of the related areas of biomedical, coping and service-related knowledge. The participants expressed in their feedback that they had found the guidance on communication and managing difficult behaviours particularly helpful.

### *Methodological issues*

Psycho-educational groups for close relatives of people with dementia have traditionally been evaluated using measures of anxiety, depression and strain, all of which are usually elevated in this population. Within the research there is a trend for carers of people with dementia to show a reduction in symptoms of depression and strain, but an increase in levels of anxiety following interventions (Cooke et al, 2001; Pusey & Richards, 2001). This has been shown to be dependent on a number of factors such as the individual's resources, their age, their gender and the level of

disability or stage of decline of the person with dementia (Toseland & Rossiter, 1989; Depp et al, 2003). As a result of factors such as these, there is a general agreement that using self-report measures of anxiety, depression and strain to evaluate a time-limited group is not ideal (Perry, 2002).

The measures used in this study were well-validated tools, however there may have been issues that rendered them less effective at capturing change in this population. It could be argued that the emotional processes likely to be involved in caring for a loved one with a progressive illness are likely to be much broader than a brief measure like the HADS would be able to capture. Issues such as loss, grief and adjustment would not be encompassed by this measure. Also, when measuring mood state in older people it may be worthwhile using a scale such as the Geriatric Depression Scale (GDS) which factors out physical limitations in the measurement of mood.

There are many psychological, physical and systems factors that may be involved in the process of care giving (Charlesworth, 2001), all of which would not be possible to evaluate over the course of a short-term intervention. Aspects such as the effect of increasing insight into the progressive nature of dementia, the carers' level of social support or isolation, perceived quality of life, coping style, self-esteem, physical health and financial burden are all likely to have an impact on the carers' emotional well-being and perceived ability to provide care. It would have been worthwhile measuring these factors.

### *Limitations & improvements*

The time limitations inherent in setting up, offering and attempting to evaluate this group meant that only carers could be involved in the group. This group would have ideally operated in a parallel format, for both the carers and the persons with dementia. The group was only offered to the carers in this instance due to organisational constraints. Due to the clinician's knowledge of the

variation in the stage of dementia of the participants close relatives, it was not considered appropriate for them to form a group.

In future interventions, it may also be worth considering matching the group members. This may involve paying more attention to who is the carer, as in this case, all were spouses or close relatives and the group was mixed in terms of gender. It remains to be seen as to whether there is benefit in having gender or relationship specific groups for carers, as some findings have indicated (Toseland & Rossiter, 1989; Depp et al, 2003). The participants involved in the group were those who defined themselves in the caring role, and indeed the majority did live with the person with dementia and were the sole care provider. It may be more appropriate for the person with dementia to nominate their carer (Charlesworth, 2001).

During the evaluation of the group, the facilitators and participants felt that a slightly longer group would be more beneficial, perhaps for eight to ten weeks. It was felt that this would allow the material to be covered in greater depth as well as providing the participants with more informal space to share their experiences with each other. This is also more in line with treatment manuals and protocols available for groups of this type (Gallagher-Thompson et al, 2000; Coon et al, 1999). Another useful consideration is to provide modular interventions that give carers the option to attend the topics that are relevant to them and their situation.

The Trainee would have valued more involvement in running the group, however due to time constraints this was not possible. Being able to meet with the participants before and after the group and hearing the positive comments made was a valuable experience for the Trainee. Reading some of the qualitative literature regarding caring (Aarons, 2003; Perry, 2002) and discussion in supervision helped to increase the Trainee's insight into the experience of carers and the processes involved in group work of this nature. Involvement in this study helped to foster an appreciation of the limits and realistic outcomes for a time-limited intervention.

### *Service implications & future research*

The group was well received by the carers and positive outcomes were indicated. It would be beneficial to extend this audit to evaluate the efficacy of this group intervention for carers, allowing for statistical evaluation looking at clinically significant change for the participants. Following on from this, it would be appropriate to offer this service as standard.

It may be worth considering some of the changes mentioned above, such as increasing the length of the group and also taking into account the carers' feedback by providing the group at the initial stage of diagnosis. Developing a standard treatment manual, which can accommodate individual gaps in knowledge and participant need, taking account of the participants' scores on the intake questionnaires, may also be considered. This type of individual, needs-led approach has been recommended by other commentators (Depp et al, 2003; Gallagher-Thompson et al, 2000)

Following this study, it was decided to provide the group in parallel format once more and extend the group to eight weeks. There was also recognition by the group facilitators that a more systematic recruitment process would need to be implemented, with improved matching of the participants involved. It was decided to programme the group at regular intervals throughout the year so that a systematic referral process could be set up.

Longer-term improvements were highlighted based upon the qualitative feedback from participants. This included the importance of liaising with referrers in order to improve 'early enough' detection of participants who may wish to attend the group. Asking people whether they might be interested in accessing a group, should a diagnosis of dementia be received, and contacting them at various stages may be a useful first step to providing support to people following diagnosis. By being proactive in this way, the hope would be to be able to provide more timely and effective support to



people with dementia and their close relatives who may otherwise feel isolated. It was intended that in the longer term, the group would be extended across the regional area, with an aim to provide all carers, close relatives and people receiving a dementia diagnosis via the district memory clinic the opportunity to attend the group programme.

In order to provide appropriate care, statutory services have a responsibility to monitor and assist those informally giving care to persons with dementia. The government initiatives and service frameworks (DOH, 2001) indicate the key role of informal carers in providing adequate services for people with dementia. Early identification would be key to detecting carers at risk of high levels of strain and poor physical and emotional health. This would be most usefully carried out during the carer's assessment as referral links into the group could be set up to aid a more timely delivery of the intervention.

This group was based upon research evidence and guided by government recommendations and seemed to provide the appropriate ingredients to enable carers to cope more effectively and reduce the negative effects of caring on their lives. The long-term benefits of group interventions such as this remain to be seen. It may be that small reductions in aspects such as strain, improvement in dementia related knowledge and increases in self-efficacy may be of benefit to carers by improving quality of life and ability to care. Effective, developed systems for supporting carers are still somewhat lacking and access to such services varies across localities. It seems groups such as that evaluated are important and well received first steps in providing assistance to and improving well-being for this valuable group of people.

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## **Literature Review**

### **The role of avoidance in eating disorders: A review.**

## **The role of avoidance in eating disorders: A review.**

### **Introduction**

It is widely acknowledged that the eating disorders share a degree of similar features and maintaining mechanisms. This has led to recent theoretical and clinical developments within the field which take a 'transdiagnostic' approach to understanding and treating eating disorders (Fairburn, Cooper & Shafran 2003). Recently certain cognitive behavioural processes have been considered to also be 'transdiagnostic' and have been identified as being present across psychological disorders (Harvey, Watkins, Mansell & Shafran 2004). Behavioural and cognitive avoidance has been suggested as one of these processes (Hayes, Wilson, Gifford, Follette, & Strosahl 1996; Hayes, Strosahl, & Wilson 1999; Harvey et al 2004). This review will attempt to demonstrate the key role of avoidance of experience in understanding eating pathology, which is not addressed by current conceptualisations. A summary of the research evidence will be presented. The review will begin by giving a brief description of the eating disorders as they are classified, and some of the difficulties and questions eating disorders raise for clinicians and researchers. This will be followed by a brief outline of the dominant model of understanding eating disorders. The review will then consider a newer cognitive-behavioural model of psychopathology, part of the 'third wave' that includes mindfulness and acceptance components (Hayes et al 1999), which may offer more to a clinical understanding of eating disorders by taking into account the process of avoidance.

### **The importance of a psychological understanding of eating disorders**

Eating disorders refer to excessive behavioural attempts at weight control or a non-organic disturbance in eating habits resulting in a clinically significant impact in psychosocial functioning and physical health (American Psychiatric Association 1994; Garner & Garfinkel 1997; Garfinkel 2002; Fairburn & Brownell 2002). Eating disorders are highly prevalent in Western society (van Hoeken & Lucas 1998; Nielsen 2001) and are a common clinical problem. In a health district of 500, 000 it can be expected that there will be 200 new cases per year (Bell, Clare & Thorn 2001),

consisting of approximately 30% bulimia nervosa (BN), 20% anorexia nervosa (AN) and 50% eating disorder not otherwise specified (EDNOS). Eating disorders are topical and attract much attention from clinicians and researchers and also from the public and the media. Eating disorders are of concern to clinicians as they carry the highest mortality rate of all the psychiatric disorders, either via medical complications associated with the symptoms of the disorder or via suicide (Bell, et al 2001; Bulik 2002; Garner & Garfinkel 1997; Harris & Barraclough 1998; Nielsen, Moller-Madsen & Isager 1998).

The interaction of psychological, biological and social factors has been implicated in the cause and maintenance of the disorders (Fairburn & Harrison, 2003). The primary explanatory and treatment models are psychological and as a result, clinical psychologists have much to offer the field in terms of advancing theory and treatment. Cognitive behavioural models of the eating disorders have been at the forefront of new developments in treatment (Cooper 2005; Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong 2003; Hay PJ, Bacaltchuk J, Stefano 2004; Fairburn, Marcus, & Wilson 1993; Fairburn & Brownell 2002). The NICE guidelines (2004) for BN are the first to recommend a psychological therapy, CBT-BN (Fairburn et al 1993), as the treatment of choice for a psychiatric disorder (Wilson, 2005). However, the current state of the outcome trials for AN means that no current treatment intervention can be strongly recommended (NICE, 2004; Hay et al 2004; Wilson 2005). EDNOS, while being the most clinically prevalent type of eating disorder has received little attention in the research. Treatment guidelines tend to follow that of BN, where normal weight, binge-eating and compensatory strategies are present (Fairburn & Harrison, 2003).

In order for cognitively based treatment models for eating disorders to be evidence based, there is a need to understand the cognitive processes underlying the disorders, which we might expect CBT to act on. It would be easy to assume that all cognitive behavioural theories are the same, however recent developments in CBT theory have emerged that may be applicable to eating disorders. Information processing models may also have implications for eating disorders. These will be addressed in due course.



## **A diagnostic description of eating disorders: AN, BN and EDNOS**

Within current DSM IV criteria (see Appendix A) eating disorders are categorised into AN, BN and EDNOS. Binge Eating disorder (BED) is the most commonly found eating disorder within this category (Grilo, 2002). The core diagnostic features that distinguish BN and AN are as follows; AN involves severe restrictive food intake in order to actively maintain a very low weight (e.g. body mass index  $\leq 17\text{kg/m}^2$ ), in BN attempts to severely restrict food intake are punctuated by repeated periods of binge eating. Binges are usually followed by compensatory behaviours such as vomiting, laxative use or excessive exercising. Within BN sufferers can be within a normal weight range, another distinguishing feature from AN. BED differs in that extreme weight control behaviours are not used.

The eating disorders have many features in common and it is acknowledged that patients are likely to migrate across the disorders (Fairburn, Cooper & Shafran, 2003; Fairburn & Harrison 2003). It is argued that BN, AN and EDNOS may share common cognitive and behavioural mechanisms which are implicated in their maintenance. It is likely that there are common risk factors associated with the development of the disorders (Fairburn, Welch, Doll, Davies & O'Connor 1997; Fairburn, Doll & Welch 1998; Fairburn, Cooper, Doll & Welch 1999). It is also well established that the eating disorders have high diagnostic co-morbidity with disorders such as depression and anxiety, PTSD and personality disorders (see Fairburn & Brownell, 2002). The degree of shared clinical features combined with the movement of patients between the disorders over time, has led to criticism of the existing diagnostic categories for eating disorders. A cognitive-behavioural 'transdiagnostic' approach has been suggested as a more appropriate way of conceptualising eating pathology (Fairburn et al 2003). This calls into question the specificity of the diagnostic groupings for eating disorders. If as proposed, eating disorders share common mechanisms contributing to their development and persistence, it is feasible that there are underlying cognitive behavioural processes that may be common across all psychological disorders. In other words, 'transdiagnostic' processes (Harvey et al, 2004).

## **Cognitive-behavioural models of eating disorders**

A thorough description of the major cognitive models for BN and AN is beyond the scope of this review. It is proposed that a set of beliefs concerning food, weight and body shape, promote and maintain the symptoms of BN, AN and EDNOS (Fairburn et al 1993; Fairburn 1997; Fairburn et al 2003 Cooper 1997; 2003; 2005; Fairburn, Shafran & Cooper 1999; Wilson 1999). The over-evaluation of body shape and weight is seen to be the 'core psychopathology' of eating disorders (Fairburn et al 2003). This has been proposed as the major cognitive contributor to the maintenance of AN (Fairburn et al 1999) and the other eating disorders (Fairburn et al 2003). The most prominent behavioural expression of this concern would be dietary restraint. Other key clinical features would be aspects such as body checking and body avoidance (APA, 1994; Shafran, Fairburn, Robinson & Lask, 2004). Fairburn and colleagues' CBT-BN protocol (1993) attempts to address the key behavioural features, in line with the DSM IV description of the disorders. It is this version of CBT that the NICE guidelines recommend and it remains the most consistently evaluated and efficacious available (Hay et al 2004; Bell et al, 2001; Wilson, 2005; NICE, 2004). However, due to findings that for some sufferers, CBT-BN is insufficient (Fairburn et al 2003) eliminating binge eating and purging in only 30-50% of cases (NICE 2004), the 'transdiagnostic' model has been developed. This includes proposed maintaining mechanisms of core low self esteem, clinical perfectionism, mood intolerance and interpersonal difficulties (Fairburn et al 2003). Data has yet to be published regarding the efficacy of this adapted model. While this model states that "*diagnosis is not of relevance to treatment*" (Fairburn et al 2003, pg. 522) the foundations of the 'transdiagnostic' model remain grounded in the symptom-led categorical system, with add-on modules. It may be beneficial to take a process approach to identify some of the key cognitive behavioural mechanisms underlying the core psychopathology, which may be 'transdiagnostic' across eating and other disorders. These processes would include attention, memory and avoidance (Harvey et al 2004). The focus of this review will centre on cognitive and behavioural avoidance.

## **Cognitive processing of threatening information**

Research on cognitive processes in eating disorders has traditionally used self-report measures to assess individuals' attitudes toward their weight and shape, and thoughts surrounding food and eating (Bemis-Vitousek & Hollon 1990). Recent research has seen the use of experimental methods adapted from cognitive psychology. These experimental paradigms are increasingly popular as they may reduce some of the biases inherent in self-report methods and to allow processes outside of conscious awareness to be measured. Many authors have commented on the utility of cognitive-experimental paradigms to increase the understanding of the cognitive processes involved in eating disorders (Bemis-Vitousek & Hollon 1990; Cooper 1997; 2005; Williams, Mathews & MacLeod, 1996).

Research along these lines has suggested that people demonstrating eating pathology process information that they find threatening in two main ways. There is a process involving an initial hyper-vigilance, or orientation, to the threat information, which suggests that eating disordered individuals are predisposed in some way to seek out stimuli relevant to their disorder (Waller, Quinton & Watson 1995; Davidson & Wright 2002; Dobson & Dozois 2004; Rofey, Corcoran & Tran 2004; Faunce 2004; Ainsworth, Waller & Kennedy 2002; Lee & Shafran 2004). This is followed by an inability to sustain the attention for these negative disorder-related thoughts, indicated by a cognitive and emotional avoidance of the threat (Waller & Meyer 1997; Meyer, Waller & Watson 2000; Israeli & Stewart, 2001; Meyer, Serpell, Waller, Murphy, Treasure & Leung 2005). These two processes shall be discussed in turn below.

### **Attentional bias to threat**

Attentional bias, or selective attention, refers to a cognitive process which occurs when two or more stimuli compete for limited cognitive resources. It is suggested that people vulnerable to particular disorders will automatically give more attention to the stimuli that is of relevance to them. This is likely to be stronger if the information is self-referent, considered to be a phenomenon common across psychopathology (Ingram, 1990; see review in Harvey et al, 2004).

There is a vast body of literature, not within the remit of the current review, using tasks thought to tap selective attention across a range of psychopathology. This has indicated a propensity for individuals to consistently selectively attend to disorder-salient and self-referent information. Findings from this line of research for eating disorders consistently suggest an attentional bias to disorder-specific threat stimuli of eating, body shape and weight (see Harvey et al 2004; Dobson & Dozois 2004; Faunce 2004; Ainsworth et al 2002; Lee & Shafran 2004 for extensive reviews). Biases in attention are so commonly found for eating disordered individuals which is suggestive of a cognitive vulnerability similar to that found in anxiety disorders (Dobson & Dozois 2004). Indeed it has been argued that in many ways eating disorders may have much in common with the anxiety disorders, such as OCD and social phobia, in that they represent a kind of 'experience phobia' (Wilson 1997 in Wilson & Roberts 2002). More recently biases in attention for stimuli more generally threatening to self esteem has been found among individuals displaying eating pathology (Quinton 2004).

There is substantial evidence to suggest that the process of selective attention to disorder-salient threat cues is present across the eating disorders and across psychopathology in general (Harvey et al 2004). Therefore, selective attention, with hypothesised links to cognitive avoidance (Lavy & van den Hout 1994) is likely to be a transdiagnostic process which may have a key role in the formation and maintenance of psychopathology such as eating disorders.

### **Avoidance of threat in psychopathology**

Avoidance can be behavioural or cognitive, although this distinction is not commonly made in the literature. A recent volume considering 'transdiagnostic' cognitive behavioural processes only considered behavioural avoidance, possibly because cognitive forms of avoidance are more subtle and not as readily observable (Harvey et al 2004). One can either avoid situations altogether, presumably grounded in some prior aversive experience, or one can attempt to 'escape' from situations after entering them. As such, behavioural avoidance is a clinical feature of certain disorders, such as specific phobia, social phobia and PTSD (APA 1994).

Cognitive avoidance could include such aspects as thought control, suppression, distraction and worry. Avoidance of painful thoughts and feelings is thought to play a key role in the development of psychopathology across a range of domains, although much of the work has been conducted within anxiety disorders (Power & Dalgleish 1997; Dalgleish & Power 1999; Wells & Matthews 1994). It is suggested that cognitive avoidance functions largely as a defensive strategy with a primary aim to improve emotional states by 'blocking' negative or threat information, and as such it is a flawed process. For example, the literature on thought suppression indicates that deliberate attempts to suppress target thoughts actually increased their occurrence (Wegner & Zanakos 1994; Wegner, Schneider, Carter, & White 1987; Clark, Ball, & Pape 1991; Clark, Winton, & Thynn 1993). There is evidence to suggest that attempts to eliminate or suppress negative emotion and cognition can be counter productive over the longer term, as these efforts may lead to an amplification and re-occurrence of the suppressed thoughts (see review by Wenzlaff & Wegner 2000; Wilson & Roberts 2002; Pennebaker 1997 Hayes et al 1996).

As a 'process' model the Self-Regulatory Executive Function model (S-REF; Wells & Matthews 1994; Wells 1997; Wells 2000) considers metacognitive processes such as worry and rumination as key factors in the development and maintenance of psychopathology (Wells 1997; 2000; Papageorgiou & Wells 2003; Cooper, Todd & Wells 2004). It is argued that worry can act as a coping strategy for controlling thoughts. Less distressing worrying thoughts can replace highly aversive ones (Wells & Davies 1994; Wells 2000) and therefore worry has been put forward as a process of cognitive avoidance (Borkovec, 1994; 2002; Borkovec, Alcaine & Behar, 2004). It is proposed that worry permits people to process difficult emotional concerns at a more verbal conceptual level thus reducing physiological and emotional arousal. However, this means that adequate emotional processing may not occur (Borkovec et al 2004). It has been suggested that beliefs about the importance of controlling thoughts may lead to the use of cognitive avoidance strategies (Purdon, 1999). The body of literature suggests that while avoidant styles of coping may work in the short term, these processes may worsen outcomes in the long-term (Purdon, 1999; Hayes et al, 1996).

## **Behavioural and cognitive avoidance in eating disorders**

People with eating disorders exhibit behavioural avoidance in a number of ways, although it is not a specific diagnostic feature (APA, 1994). The clearest example of this is when restricting calorie intake, they will avoid fattening foods and attempt to 'escape' from situations in which they are uncertain of the calorie content of food. As previously mentioned, body avoidance is common, this includes refusal to be weighed and wearing baggy clothes to disguise body shape (Shafran et al 2004).

Studies of thought suppression in eating disorders are very limited and restricted to analogue samples (Johnston, Bulik & Anstiss 1999; Oliver & Huon 2001; O'Connell, Larkin & Mizes 2005). The findings indicate no significant differences in intrusive thoughts following thought suppression in participants demonstrating higher risk of 'eating pathology' compared to those of low risk. However, the pattern may be different for clinical populations and this remains to be explored within the research. Work has been done to attempt to capture metacognitive beliefs in eating disorders, although once again this is very limited (Mizes et al 2000; Waller 2003; Waller et al 2003). Recently 'thought-shape fusion' has been conceptualised, which is the belief that thoughts are able to cause weight gain or increase feelings of fatness (Shafran, Teachman, Kerry & Rachman 1999). One study has indicated the presence of these 'thoughts about thoughts' in a clinical anorexic sample (Radomsky et al 2002).

Cognitive avoidance is thought to play a role in disorders for which impulsivity is a key feature and BN would come into this category (Heatherton & Baumeister 1991; Baumeister, Heatherton & Tice 2001). An explanation put forward is that the initial attentional bias to personally-relevant threat cues leads to self-focused negative affect that the individual finds intolerable (Baumeister et al 2001; Heatherton & Baumeister 1991). In seeking to escape from this negative self-awareness, the individual may narrow the focus of cognitive attention from the abstract level of self-evaluation (e.g. "I'm a failure"), to a more concrete and immediate stimulus environment (e.g. the sensations of eating). Hence bulimic behaviours serve to block or shift attention from the negative thoughts and feelings about the self, to a concrete behaviour such as binge-eating (Heatherton & Baumeister

1991). In this way, binge eating would be seen as a form of avoidance or 'escape' from threatening information the individual is biased toward attending to.

In contrast to the volume of research into selective attention, there is limited evidence exploring the process of cognitive avoidance in eating disorders. Table 1 provides a summary of the key studies to date and there now follows a brief review of this literature.

### **Studies of cognitive avoidance in eating disorders**

Studies using self-report methods have found that women with eating disorders are more likely to engage in rumination and cognitive avoidance as coping strategies than women without an eating disorder (Troop & Treasure 1997; Troop, Holbery & Treasure 1998). Research utilising cognitive-experimental paradigms has led to the proposition that eating disordered individuals demonstrate cognitive avoidance of particular threat stimuli which may be a factor in the maintenance of the disorders (Ainsworth et al 2002). Cognitive processing paradigms such as such threat stimulus identification tasks (Waller et al, 1995), single word anagram solution tasks (Waller & Meyer 1997; Meyer et al 2005) and the modified Stroop task (Seddon & Waller 2000) have been used to date. A full description of these tasks is beyond the scope of this review. Table 1 presents each study and gives an overview of the measures used, the population studied and the main findings.

**Table 1: Studies of eating pathology and cognitive avoidance using various experimental paradigms**

Study	Participants	Paradigm used	Variables	Self-Report Measures	Main Findings
Waller, Quinton & Watson (1995)	Analogue sample – female students	Computer-driven word recognition test	Neutral words & unspecific threat words Group	EAT 26 – sample split into High & Low bulimic attitudes.	Women with high bulimic attitudes group were slower to respond to threat words. No association with women in the restricting group
Waller & Meyer (1997): 2 part study	Analogue sample – Study 1: female students Study 2: male & female students	Anagram solution task	Study 1: Anagrams of neutral, food and threat words Study 2: Anagrams of physical threat (e.g. <i>burn</i> ), ego self (e.g. <i>failure</i> ) & ego other threats (e.g. <i>insult</i> )	EDI in both studies	Study 1: No association found between solution times for food or threat words & scales of the EDI. Study 2: No correlation between physical threat, ego other threat & EDI subscales. Positive correlation between solution times for ego-self threats and 'ego development' scales of EDI (i.e. Ineffectiveness, Social Insecurity)
Meyer, Waller & Watson (2000)	Analogue sample – female students	Computer-driven threat processing task	Neutral & ego-self threats. Interstimulus intervals (ISI) of 500, 1000, 1500, 2000ms	EDI	All women were slower to respond to threats following the 2000ms ISI. Women with higher bulimic attitudes were slower to process threats after the 1500ms ISI. No links were found with restrictive features on the EDI.
Seddon & Waller (2000)	Analogue sample – female students	Computer-driven modified emotional Stroop task	Group: split by age: older (>21), younger (≤21) & BITE Negative emotional words, positive emotional words, neutral words. Positive (attentional bias) or negative (cognitive avoidance) interference score	BITE – sample split into High & Low BITE score.	'Younger' women with bulimic attitudes showed cognitive avoidance of both positive & negative emotional cues. 'Older' women showed an attentional bias for negative emotion cues.
Meyer, Serpell, Waller, Murphy, Treasure & Leung (2005)	Women with an eating disorder (n=50): AN-R*=13, AN-B/P*=15, BN=22 50 non-clinical women	Anagram solution task	Group: eating disorder, no eating disorder; type of eating disorder; presence or absence of bulimic symptoms. Neutral, food & ego threat anagrams.	EDI	BN symptom group took longer to process ego-threat words than controls. No differences in solution times were observed for neutral or food related words. There was a general trend across the groups to process food words more rapidly, restrictive AN in particular (NS)*.

\* AN-R = Anorexia Restricting Type

\* AN-B/P= Anorexia Binge/Purge Type

\*NS = Not significant



The research presented in Table 1 raises many issues. The use of more 'automatic' processing tasks, such as the modified Stroop, is grounded in a debate regarding how successfully this task taps selective attention or avoidance (Lavy & van den Hout 1994; Williams, Mathews & MacLeod, 1996). This suggests that the experimental paradigms that tap the very early stages of information processing may be unreliable in distinguishing cognitive avoidance (Ainsworth et al 2002). Therefore it is difficult to say whether the findings from the Waller et al (1995), Meyer et al (2000) and Seddon & Waller (2000) studies reflect cognitive avoidance *per se*. Therefore the use of more strategic and selective processing tasks that may measure the later stages of information processing, such as the anagram task, is much needed (Waller & Meyer 1997; Meyer et al 2005). The findings using this paradigm tend to suggest that individuals displaying BN psychopathology demonstrate cognitive avoidance of particular ego-threat stimuli. This lends some support to Heatherton and colleagues' (1991; 2001) conclusion that threats to the self-esteem (ego-threats) are more relevant in the development of eating psychopathology than disorder-specific threats related to food and body image.

It is clear that little empirical evidence is available investigating cognitive avoidance with a clinical eating disorder sample. When research has been conducted with a clinical group, only those showing bulimic behaviours have demonstrated cognitive avoidance (Meyer et al 2005). Therefore, while a cognitive avoidance mechanism could be proposed for those displaying binge-purge psychopathology, very little is known about the way the cognitive process of avoidance occurs in AN. One might expect this to function differently, as those with restrictive eating do not use binge-eating to shift the focus of their attention. Indeed, the most recent research indicated a tendency for those with AN restrictive pathology to process food-associated stimuli more rapidly, although this was not significant (Meyer et al 2005). The picture for AN is far from clear.

This is compounded by a lack of clarity in the internal cognitive mechanisms involved in avoidance. One proposition, based on Beck & Clark's (1997) information processing account of anxiety, suggests that cognitive avoidance (strategic information processing) follows on from an initial attentional bias (automatic information processing). Within this model cognitive avoidance is a defensive process in which threatening information is processed more strategically and thus more

slowly (Beck & Clark 1997; Ainsworth et al 2002). The proposed reason for this is that eating disordered individuals will engage in internal strategies, dissociation would be an example of this (Waller 2003), to diminish the activation of painful thoughts and feelings which may be triggered by threat information. This is particularly apparent when the threatening information being processed is personally relevant to the individual, such as threats to one's self esteem (Heatheron & Baumeister 1991).

The evidence base for the presence of cognitive avoidance in eating disorders is clearly at an early stage. There is scope for refinement and development of the paradigms and for exploring the processes within eating disorders other than BN to examine if cognitive avoidance is truly a 'transdiagnostic' process.

### **Models that may account for avoidance in psychopathology**

The experimental work presented in Table 1 is largely grounded within a schema information processing account (Young 1999; Beck & Clark 1997). Models linking cognitive and behavioural processes and emotion within psychopathology can offer alternative explanations and a context for cognitive avoidance. Theories that fit within this category are the S-REF (Wells & Mathews 1994; Wells 1997; Wells 2000), which implicates metacognitive processes such as worry and rumination in the development and maintenance of disorders; and the Interacting Cognitive Subsystems model (ICS; Teasdale & Barnard 1993). A full description or review of these models is beyond the scope of the current review however, they have relevance and applicability to the field of eating disorders as 'transdiagnostic' accounts of emotional disorders (see Harvey et al 2004).

A theoretical model which holds avoidance at the centre of the cause and maintenance of psychopathology is Relational Frame Theory (RFT) and the therapy derived from this, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson 1999). ACT is a part of the 'third wave' of cognitive behaviour therapies (after behaviour therapy and cognitive therapy); a theoretical movement that makes use of acceptance and mindfulness processes (Hayes 2004; Hayes, Follette & Linehan 2004). The 'third wave' and ACT in particular take a second-order metacognitive stance

and as such are somewhat at odds with the traditional CBT approach to cognition. Within the theoretical stance of these methods the emphasis is not on changing the content of thought through rational dispute rather the emphasis is on altering the awareness, relationship and the context of the thought. This latter point is specific to ACT (Hayes et al 1999). Hayes and colleagues (Hayes, Wilson, Gifford, Follette & Strosahl 1996; Hayes et al 1999; Hayes 2004) also suggest that common processes of aetiology or maintenance should be the basis for research and practice. They therefore focus on a process approach, rather than the syndrome-specific categorical approach which DSM IV proposes.

The therapeutic goal of ACT is to teach acceptance of unpleasant emotions, physical sensations and cognitions. To achieve this, the emphasis of ACT is experiential rather than didactic, with the aim of helping clients to recognise and ultimately dispense with attempts to avoid or suppress negative private experience. The importance of commitment to valued outcomes is emphasised alongside the development of behaviours that will help to achieve these outcomes. ACT assumes that in psychopathology functional diagnostic dimensions (Hayes et al 1996) like experiential avoidance “*prevent a behavioural commitment to living a valued life*” (p.81, Hayes et al 1999). Supported by research, functional diagnostic dimensions are behavioural and cognitive processes involved in the aetiology and maintenance of clinical disorders (Hayes, Luoma, Bond, Masuda & Lillis 2006; Harvey et al 2004).

ACT is grounded in a tradition of empirical research and is evidence based. Positive outcomes have been found across a number of disorder categories and the intervention has been found to be superior to treatment-as-usual and CBT in some cases (see Hayes et al 2006 for a review of the studies to date).

### **Experiential avoidance in ACT**

Hayes and his colleagues describe experiential avoidance as an unwillingness to experience negative unwanted ‘private events’ (thoughts, feelings, images, memories) and engaging in behaviours to suppress and reduce them, even when attempts to do so are harmful (Hayes et al

1996; 1999). From an ACT perspective, attempts to avoid, control and suppress unwanted experiences are common, as these strategies help to reduce the negative state in the short term. However, over the longer term they can become problematic as it may be difficult to maintain constant efforts in these avoidant processes. This is why poorer long term outcomes in a range of disorders are expected for those prone to experiential avoidance (Purdon, 1999; Hayes et al, 1996).

Experiential avoidance is considered within ACT to be a transdiagnostic process that is common across disorders and central to the maintenance of disorders (Hayes et al, 1996; Harvey et al, 2004). ACT does not differentiate between behavioural and cognitive avoidance, rather it proposes that experiential avoidance leads to a restricted repertoire of behaviours (behavioural rigidity). This could be applicable to eating disorders as binge eating in BN and BED and food restriction in AN can be viewed as attempts to avoid negative emotional, food, weight and body image thoughts and feelings, in line with other theoretical suggestions (Heatherton & Baumeister, 1991). An ACT treatment manual for AN has recently been written (Hefner & Eifert, 2004) and a group of papers based on a case study applying ACT therapeutic principles to an AN sufferer has been recently published (Heffner, Sperry, Eifert & Detweiler, 2002; Wilson & Roberts, 2002; Hayes & Pankey, 2002). The role of experiential avoidance in eating disorders would appear to be crucial. However at this time specific ACT research for the process in eating disorders is scarce.

## **Conclusion**

This review has attempted to provide an overview of avoidance, a cognitive behavioural process proposed to be of importance transdiagnostically and to an understanding of the routes to and maintenance of eating pathology. The full clinical implications of cognitive behavioural avoidance are widespread but beyond the present discussion. However this review has highlighted the ACT model, which considers experiential avoidance as a key process in psychological disorders. To back up the theory for eating disorders and avoidance it is essential that more research is conducted. At present the research base is inadequate to draw any conclusions regarding the role of cognitive avoidance in eating disorders. Little is understood about the process within a clinical

group, particularly with AN and EDNOS. Studies using strategic processing tasks should be conducted to adequately distinguish selective attention and cognitive avoidance. It has been highlighted that concerns other than those of food, weight and body shape may have more relevance in cognitive avoidance among eating disordered individuals. Further work considering the importance of avoidance of threats to self esteem (Heatherton & Baumeister, 1991) will be useful for advancing the knowledge concerning cognitive content in eating disorders. It has been acknowledged that further empirical research is required into the role of experiential avoidance in eating disorders (Hayes & Pankey, 2002).

Research into these types of cognitive behavioural processes across the eating disorders may have important implications for the future development and adaptation of theoretical models. This may further increase our understanding and improve treatment outcomes. Establishing evidence for the role of cognitive avoidance in eating disorders may provide support for treatment approaches that emphasise acceptance of previously avoided negative private events as a key route to recovery, and potentially improve treatment efficacy.

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## **Appendix A: Diagnostic Descriptions for Eating Disorders (Modified from DSM-IV)**

### Diagnostic description of anorexia nervosa:

- a. Refusal to maintain body weight at or above a minimally normal weight for age and height, (e.g. weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% below that expected)
- b. Intense fear of gaining weight or becoming fat, even though underweight,
- c. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self evaluation, or denial of the seriousness of the current low body weight
- d. In post-menarcheal females, amenorrhea, i.e. absence of at least three consecutive menstrual cycles (a woman is considered to have amenorrhea if her periods occur only following hormone, e.g. oestrogen, administration).

Anorexia nervosa may be further defined as meeting criteria for either the restrictive type (during the current episode of anorexia nervosa, the person has not regularly engaged in binge-eating or purging behaviour, i.e. self-induced vomiting or the misuse of laxatives, diuretics, or enemas), or the binge-eating/purging type (during the current episode of anorexia nervosa, the person has regularly engaged in binge-eating or purging behaviour, i.e. self-induced vomiting or the misuse of laxatives, diuretics or enemas).

### Diagnostic description of bulimia nervosa:

- a. Includes recurrent episodes of binge eating;
- b. Recurrent inappropriate compensatory behaviour to prevent weight gain;
- c. The average frequency of both binge eating and compensatory behaviour should be at least twice a week for three months
- d. Self evaluation is unduly influenced by body shape and weight and the disturbance occurring not exclusively during episodes of anorexia nervosa.

Types of bulimia nervosa include: purging: using self induced vomiting, laxatives, diuretics, or enemas. Non-purging: fasting, exercise, but not vomiting or other abuse as in the purging type.

### Diagnostic description of binge eating:



Eating, in a discrete period (e.g. hours), an objectively large amount of food, accompanied by a lack of control over eating during the episode.

## **Appendix B: Search Strategy for the identification of relevant studies**

The references listed in this literature review were chosen on the basis of their importance, accessibility, and usefulness as sources of further information on the topic and eating disorders, transdiagnostic processes and cognitive behavioural avoidance.

### **Detailed journal and book searching:**

A detailed search of each issue of The International Journal of Eating Disorders was carried out for the years 2005 – 2006 to identify some of the most current papers regarding theoretical models of eating disorders, treatment outcomes and papers on the topic of avoidance.

Much of the data on prevalence and epidemiology was gained from the most recent large scale reviews, including the NICE guidelines and Cochrane reviews, and major reviews or commentaries in the field. This was felt to be adequate as the main focus of the review was not on epidemiology. Key articles referenced in these reviews were obtained.

Additionally, relevant professional key texts and books on eating disorders, attention, cognition, cognition and emotion (written in English) were reviewed.

### **Electronic searching:**

PsycINFO was the major source of information for the purposes of this literature review. A MEDLINE search was also conducted and a search of the Cochrane Library was carried out. The Annual Review of Clinical Psychology and Clinical Psychology Review was searched for articles on eating disorders since the year 2000 to obtain the most up-to-date major review papers for psychological treatment of eating disorders. It was not essential to the literature review to access evidenced based trials or treatment research, as randomised controlled trials only provide indirect evidence for the processes that maintain disorders.

Due to the extensive volume of literature and reviews on the subject of eating disorders, identified in an initial search setting no limits, only articles published since 1990 were considered. Only articles written in English, conducted with human participants were reviewed. Boolean operators (AND, OR, NOT) and the truncation technique was used. The key terms identified in the main articles were used within the search.

Relevant material was identified by searching the electronic databases using the following terms:

#1. EATING DISORDERS or BULIMIA or BULIMIA NERVOSA, ANOREXIA or ANOREXIA NERVOSA, BINGE EATING or BINGE EATING DISORDER or EATING DISORDERS NOT OTHERWISE SPECIFIED, EDNOS or ATYPICAL EATING DISORDER

#2. AVOIDANCE or COGNITIVE AVOIDANCE or BEHAVIOURAL AVOIDANCE or EXPERIENTIAL AVOIDANCE or STRATEGIC PROCESSING or CONTROLLED PROCESSING

#3 (#1 AND #2)

#4 THOUGHT SUPPRESSION or WHITE BEAR THOUGHT SUPPRESSION or THOUGHT CONTROL or DISSOCIATION

#5 (#1 AND #4)

#6 ATTENTION or SELECTIVE ATTENTION or ATTENTIONAL BIAS or AUTOMATIC PROCESSING or STROOP or STROOP TEST or DOT PROBE or DOT PROBE TEST

#7 (#1 AND #6)

**Example of electronic search strategy:**

The table below gives a detailed example of the search procedure using PsycINFO to identify the studies concerning cognitive avoidance in eating disorders.

# Search	Terms	Database	Limits	Date of most recent search	Number of records
# 1	EATING DISORDERS or BULIMIA or BULIMIA NERVOSA or ANOREXIA or ANOREXIA NERVOSA or BINGE EATING or BINGE EATING DISORDER or EDNOS or ATYPICAL EATING DISORDER	PsycINFO	(LA:PSYI = ENGLISH) and (PO:PSYI = HUMAN) and (PY:PSYI = 1990-2007)	05/10/06	12550
# 2	AVOIDANCE or COGNITIVE AVOIDANCE or BEHAVIOURAL AVOIDANCE or EXPERIENTIAL AVOIDANCE or STRATEGIC PROCESSING or CONTROLLED PROCESSING	PsycINFO	(LA:PSYI = ENGLISH) and (PO:PSYI = HUMAN)	05/10/06	12736
# 3	#1 AND #2	PsycINFO		05/10/06	227
# 4	COGNITIVE AVOIDANCE	PsycINFO	(LA:PSYI = ENGLISH) and (PO:PSYI = HUMAN) and (PY:PSYI = 1990-2007)	05/10/06	161
# 5	#1 AND #4	PsycINFO	(LA:PSYI = ENGLISH) and (PO:PSYI = HUMAN) and (PY:PSYI = 1990-2007)	15/10/06	8

For search #3 the abstracts were initially scanned for relevance. The most relevant citations were obtained wherever possible (it was not possible to obtain some Dissertation Abstracts). As the focus of the review was specifically on new experimental paradigms for measuring cognitive avoidance, date limits were set and a specific search using the term 'COGNITIVE AVOIDANCE' was carried out.

**Reference searching:**

The reference lists of all the papers selected were inspected for further relevant citations which were obtained. PsychINFO and the Web of Science ISI Citation Index were used to obtain cited references and to search the authors and articles which had cited the relevant references.

**Web searching:**

The search engines [www.google.com](http://www.google.com) and 'google scholar' were used. The internet was particularly helpful in accessing the NICE guidelines and department of health documents, British Psychological Society information and information from the Acceptance and Commitment Therapy website [www.contextualpsychology.org](http://www.contextualpsychology.org).

**Thesis**

**Cognitive processing of threat information in female  
eating disorder patients: The role of attentional bias and  
cognitive avoidance**

**Diana Maria Sporle**

**Year 3: May 2007**

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Appendices**

Thesis: Cognitive processing of threat information in female eating disorder patients: The role of attentional bias and cognitive avoidance

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## 1. Abstract

This study considers and explores the relationship between eating disorders and the cognitive processes of attentional bias and cognitive avoidance. These processes are also considered in terms of their contribution to the current theoretical conceptualisations of eating disorders and how this may potentially inform treatment. Previous research in the field is limited yet indicates that attentional biases exist in eating disorders, at least for disorder-specific stimuli using well recognised experimental paradigms. The research into cognitive avoidance is scarce yet has indicated that those with bulimic tendencies may use this cognitive strategy.

A modified emotional Stroop task and an anagram solution task were used to evaluate experimental hypotheses postulating that attentional bias to and cognitive avoidance of disorder relevant and self-esteem threat stimuli would be present in a group of patients with an eating disorder (N=23) in comparison with a control group (N=34). Using the emotional Stroop, the results showed limited support for the presence of attentional biases in eating disorders. For the anagram solution task, some limited evidence was found for the presence of cognitive avoidance in the clinical eating disorder sample. The limitations of the study were considered and discussed, with an emphasis on improvements for future research using these experimental paradigms. The findings of the study were also discussed in relation to the implications for eating disorder theory and treatment.



## 2. Introduction

### 2.1 Overview of the study rationale and theoretical background

This study aims to explore the nature of attentional biases and cognitive processes of avoidance in patients with clinical eating disorders (ED). Cognitive biases have a key role in the explanatory and treatment models of eating disorders, yet the research literature into these processes is limited and they are often overlooked within therapeutic interventions. There is evidence that existing cognitive behavioural (CBT) treatments have limitations for some patients. This may be due to a focus on the disorder-specific symptoms (i.e. binge-purge behaviour) rather than on the underlying dysfunctional cognitive and behavioural processes (e.g. the avoidant function of binge eating) that may maintain the disorder.

Recent advancements in cognitive behavioural theory suggest a theoretical shift in the function underpinning pathological behaviour, for example the functional role of eating behaviour in regulating emotion or avoiding intolerable experience. These theoretical discussions highlight and offer an explanation of attentional and avoidant cognitive processes. These may be usefully applied to eating disorders in an attempt to generate a functional conceptualisation of eating behaviour that can extend the dominant disorder-led models which tend to focus on the specific content over a wider view of the function of pathological eating behaviour.

It is important to demonstrate the existence of cognitive biases within the eating disorders as there may be implications for theory and treatment models. For instance, attentional biases may have a role in confirming negative beliefs about body shape and thus have a role in perpetuating these beliefs (Fairburn, Shafran & Cooper 1999; Fairburn, Cooper & Shafran 2003). As a result of attention being drawn to these negative beliefs, people with eating disorders may subsequently attempt to divert their attention away to more concrete behaviours (e.g. binge eating) as an attempt to “escape” or avoid their increased self awareness (Heatherton & Baumeister 1991; McManus &

Waller 1995). Therefore an understanding of the role of cognitive processes in eating disorders can contribute to the evidence-base of models and the treatments derived from them.

The overall goal of this study was to investigate whether patients with eating disorders show attentional biases and cognitive avoidance for food, body and self-esteem threat stimuli in comparison to neutral stimuli and in relation to a control group. This study is in line with previous research into the nature of cognitive processes in the eating disorders, yet aims to take this further.

This introduction section will broadly cover the following key areas:

- a description of the eating disorders as they are classified, including a focus on epidemiology and distinguishing features of the disorders.
- an overview and critique of the dominant CBT model for conceptualising and treating eating disorders.
- an alternative conceptualisation of eating disorders will then be presented which draws upon a variety of models of cognitive and behavioural processes in order to develop an understanding of the self-regulatory function of eating-disordered pathology.
- from this conceptualisation, two key cognitive processes of attention and avoidance will be drawn out and the research evidence and theoretical understanding of these processes will be presented, including the rationale for why they are worthy of further exploration.
- the contribution of the present study to understanding the role of cognitive processes of attention and avoidance in eating disorders will be presented, including potential clinical implications.
- the research hypotheses for the study will be outlined.

## 2.2 Clinical features unique to eating disorders

The multi-factorial interaction of psychological, biological (e.g. genetic) and environmental (e.g. familial, social and cultural) factors have been implicated in the cause and maintenance of the disorders (Fairburn & Harrison, 2003). The primary explanatory and treatment models are psychological yet these remain grounded in a diagnostic, disorder-specific classification system (i.e. the Diagnostic and Statistical Manual of Mental Disorders (4th ed; DSM-IV, American Psychiatric Association 1994). This has drawbacks and limitations for the way that eating disorders are both conceptualised and treated, which will be outlined further. The DSM-IV is currently under review and it is proposed that the classifications of eating disorders are altered to make them more representative of the clinical realities of the disorders (Fairburn et al 2007). The current diagnostic descriptions of the eating disorders are summarised and presented in Table 1 below.

**Table 1: Diagnostic descriptions for eating disorders (Modified from DSM-IV; APA 1994)**

<u><b>Anorexia Nervosa (AN)</b></u>	<u><b>Bulimia Nervosa (BN)</b></u>	<u><b>Eating Disorders Not Otherwise Specified (EDNOS) or atypical eating disorders</b></u>
<ul style="list-style-type: none"> <li>• Refusal to maintain body weight at or above a minimally normal weight for age and height, (e.g. Body Mass Index &lt;17.5);</li> <li>• Intense fear of weight gain;</li> <li>• Disturbances in the experience of body weight/shape, undue influence of body weight/shape for self evaluation, or denial of the seriousness of the current low body weight;</li> <li>• In post-menarcheal females, amenorrhea, of least three consecutive menstrual cycles.</li> <li>• May be further classified as Restricting subtype (AN/R) or binge-eating/purging subtype</li> </ul>	<ul style="list-style-type: none"> <li>• Includes recurrent episodes of binge eating;</li> <li>• Recurrent inappropriate compensatory behaviour to prevent weight gain;</li> <li>• The average frequency of both binge eating and compensatory behaviour should be at least twice a week for three months;</li> <li>• Self evaluation is unduly influenced by body shape/weight.</li> <li>• Types of BN include: purging: using self induced vomiting, laxatives, diuretics, or enemas. Non-purging: fasting, exercise, but not vomiting or other abuse as in the purging type.</li> </ul>	<ul style="list-style-type: none"> <li>• All criteria for AN are met except the individual has regular menses</li> <li>• All criteria for AN are met except that, despite substantial weight loss, the individual's BMI is in the normal range</li> <li>• All criteria for BN are met except binges occur less than twice a week or for less than 3 months</li> <li>• Use of inappropriate compensatory behaviour after eating small amounts of food or spitting out food (yet with normal BMI) Binge eating disorder (BED); recurrent episodes of binge eating in the absence of regular use of compensatory behaviours (usually associated with obesity)</li> </ul>

### *2.2.1 Clinical prevalence and prognosis in eating disorders*

Eating disorders are considered to be highly prevalent in Western society (van Hoeken & Lucas 1998; Nielsen 2001). However, despite numerous published epidemiological studies concerning the prevalence of eating disorders, community estimates are at best cautionary due to methodological weaknesses in the research (Fombonne 1995; Hoek & Van Hoeken 2003; Hoek 2006; Keel & Klump 2003; Machado, Machado, Goncalves & Hoek 2006). Some of the most recent published data on the prevalence of eating disorders (ED) puts rates at 0.3% in young females for Anorexia Nervosa (AN), approximately 1% for Bulimia Nervosa (BN) and 1% for Binge Eating Disorder (BED; Hoek & Van Hoeken 2003).

Eating disorders are a common and concerning clinical problem. In a health district of 500, 000 it can be expected that there will be 200 new cases per year (Bell, Clare & Thorn 2001), consisting of approximately 30% Bulimia Nervosa (BN), 20% Anorexia Nervosa (AN) and 50% Eating Disorder Not Otherwise Specified (EDNOS). Studies of community eating disorder services serve to highlight that the majority of cases seen by services do not meet the formal diagnostic criteria for AN and BN (see Table 1). It has been reported that individuals meeting a diagnosis of EDNOS most commonly make up the population of outpatient clinics, with the average prevalence being 60% of cases, with 14.5% for AN and 25.5% for BN (Fairburn & Bohn 2005).

Eating disorders are problematic not least in terms of clinical prognosis. A recent 21 year follow up of AN patients (Lowe, Zipfel & Buchholz 2001) indicated a standardised mortality rate of 9.8% consistent with other findings (Sullivan 1995; Sullivan, Bulik & Fear 1998). This represents a mortality rate higher than that of any other psychiatric disorder (Nielsen 2001). A chronic course of the disorder was found to be common, with Body Mass Index (BMI) remaining low after 21 years. It is interesting to note that within the course of the disorder, binge-purge behaviour was commonplace and many patients initially diagnosed with AN met a diagnosis of EDNOS at the later stages of their illness (Lowe et al 2001).

It is also well established that the eating disorders have high diagnostic co-morbidity with disorders such as depression and anxiety (Bulik 2002; Sexton, Sunday, Hurt & Halmi 1998), personality disorders (DeJonge, Van Furth, Lacey & Waller 2003), substance abuse (Fairburn & Brownell, 2002) as well as anxiety, PTSD and obsessive compulsive disorder (Scottish Executive 2001). The co-morbid relationship between the eating disorders and Axis I and II psychiatric disorders is not well understood. One possible way to understand this is that particular disorders may share common features and vulnerabilities, and may be maintained by similar processes. This will be explored further below.

### *2.2.2 Are eating disorders maintained by shared mechanisms?*

Rather than making categorical distinctions between the eating disorders, as shown in Table 1 it has been acknowledged that many of the clinical features overlap across the diagnoses (Fairburn & Harrison 2003; Waller 1993; Walsh & Garner 1997). It is argued that BN, AN and EDNOS may share common cognitive and behavioural mechanisms which are implicated in their maintenance. It is likely that there are common risk factors associated with the development of the disorders (Fairburn, Welch, Doll, Davies & O'Connor 1997; Fairburn, Doll & Welch 1998; Fairburn, Cooper, Doll & Welch 1999). As mentioned above in the longitudinal study by Lowe and colleagues (2001) there is a high degree of migration across the disorders over their course. Some studies indicate substantial movement across diagnostic categories, with around 50% of those initially diagnosed with AN going on to develop BN or an atypical ED (Eddy et al 2002; Fairburn et al 2003; Fairburn & Harrison 2003). As such it has been argued that the current cross-sectional classifications serve to create artificial boundaries which can lead to misdiagnoses (e.g. The Price Foundation group 2001).

The degree of shared clinical features combined with the movement of patients between the disorders over time, has led to criticism of the existing diagnostic categories for eating disorders. A cognitive-behavioural 'transdiagnostic' approach has been suggested as a more appropriate way of conceptualising eating pathology (Fairburn et al 2003). This calls into question the specificity of the diagnostic groupings for eating disorders. If as proposed, eating disorders share common

mechanisms contributing to their development and persistence, it is feasible that there are underlying cognitive behavioural processes that may be 'transdiagnostic' across all psychological disorders (Harvey, Watkins, Mansell, & Shafran 2004; as reviewed by Carmen 2006 this volume).

## 2.3 Theoretical background

### *2.3.1 Therapies aimed at addressing psychopathology related to eating disorders*

A number of treatments from differing theoretical orientations have been used with individuals experiencing eating disorders and have shown some degree of efficacy, such as Cognitive Analytic Therapy (CAT; Dare, Eisler, Russell, Treasure & Dodge 2001; Bell 1999) and Interpersonal Psychotherapy (IPT; Agras, Walsh, Fairburn, Wilson, & Kraemer 2000). More recently therapies addressing the potential functional processes behind eating pathology have been proposed as useful therapeutic approaches for the disorders, such as Dialectical Behaviour Therapy (DBT; Linehan 1993) adapted for use with eating disorders (Safer, Telch & Agras 2001) and schema focused work (Ainsworth, Waller & Kennedy 2001). Each of these interventions is based upon theoretical models to explain aspects of experience relevant to the function of eating pathology and they each aim to act on specific therapeutic targets (e.g. the link between emotion and behaviour in DBT).

The treatments currently recommended by clinical guidelines are those that specifically target the symptom-focused cognitions and behaviours associated with ED. At least for BN, CBT treatments are the most widely used and recommended available (Wilson 1999; NICE 2004) and have been at the forefront of new developments in treatment (Cooper 2005; Fairburn, Marcus, & Wilson 1993; Fairburn & Brownell 2002; Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong 2003; Hay, Bacaltchuk & Stefano 2004). Remission rates for symptoms (i.e. binge eating and purging) in CBT for BN are moderate; 30% to 50% of all cases remit following treatment (Craighead & Agras 1991; Fairburn, Jones, Peveler, Hope & O'Connor 1993; Garner & Garfinkel 1997; Wilson 1999). It is acknowledged that there are certain groups of patients with which the treatment has limited success (Wilson 1999; Wilson 2005).

The current state of the outcome trials for AN means that no current treatment intervention can be strongly recommended (Hay et al 2004; NICE, 2004; Wilson 2005). Only family therapy for adolescents has come through as an effective intervention for AN in the NICE guidelines (2004;



Eisler et al 2000). EDNOS, while being the most clinically prevalent type of eating disorder has received little attention in the research. Treatment guidelines tend to follow that of BN, where normal weight, binge eating and compensatory strategies are present (Fairburn & Harrison, 2003).

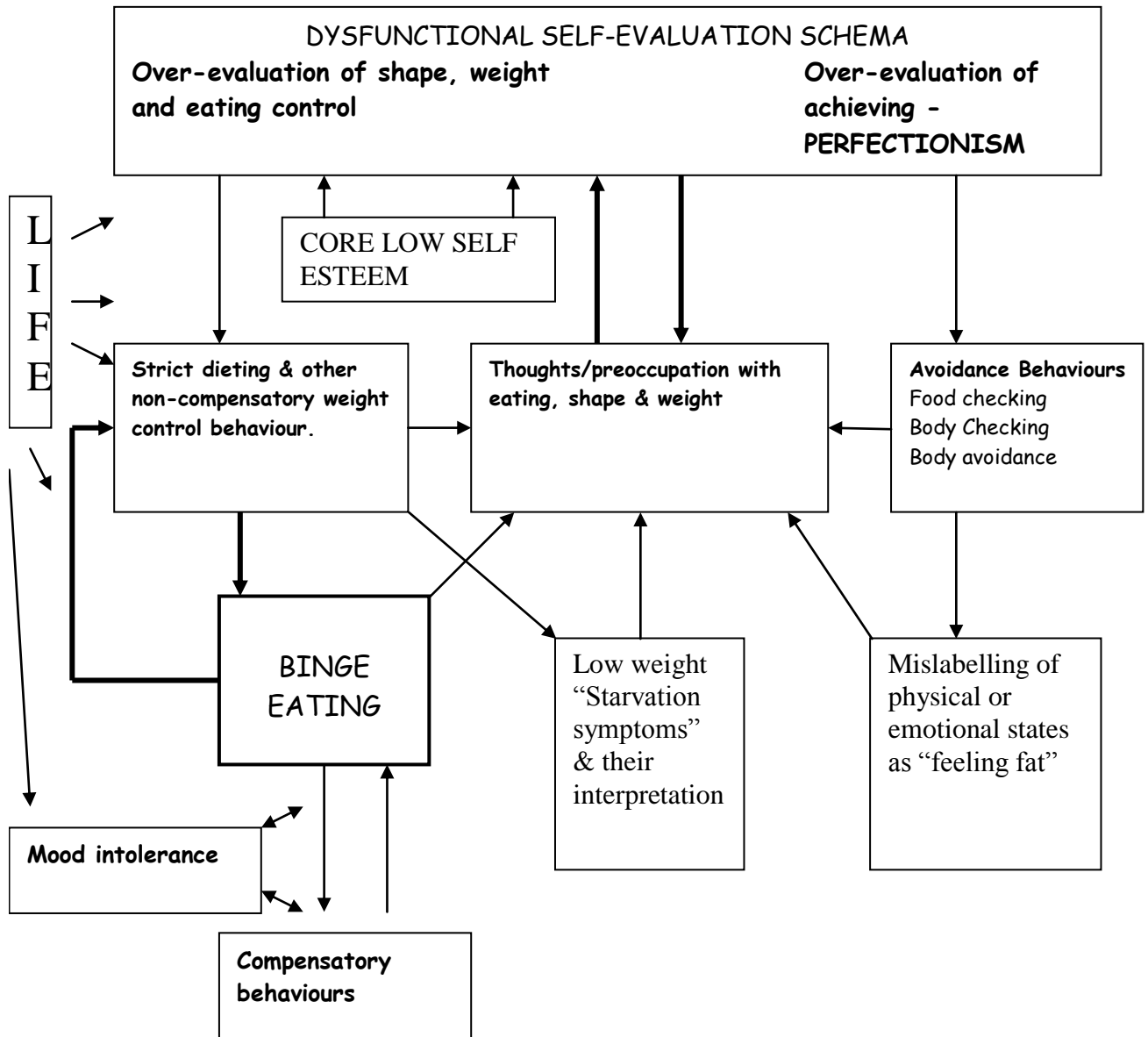
### *2.3.2 Cognitive Behaviour Theory of ED*

In response to dissatisfaction with the diagnostic groupings for eating disorders and in an attempt to advance the theory and improve outcome for eating disorder-specific CBT, Fairburn, Cooper & Shafran (2003) have proposed a transdiagnostic theory and treatment. This is outlined in Figure 1 below. This is also in line with a shift towards identifying and understanding the role of common maintaining mechanisms in psychopathology, put forward in a recent volume by Harvey et al (2004). The transdiagnostic model of ED was based on an adaptation of the existing CBT models for BN and AN (Cooper 1997; 2003; 2005; Fairburn et al 1993; Fairburn 1997; Fairburn, Shafran & Cooper 1999; Fairburn et al 2003; Wilson 1999).

The cognitive behavioural treatment models of ED state that a set of beliefs concerning food, weight and body shape promote and maintain the core symptoms of dietary restriction, binge eating and purging. Dysfunctional over-concern with body shape and weight is seen to be the 'core psychopathology' of ED (Fairburn et al 1999; Fairburn et al 2003), contributing to the maintenance of the disorders. The defining clinical features of BN, AN and EDNOS such as excessive dietary restraint and/or purging behaviours operate in a counter-regulatory relationship (i.e. starvation symptoms associated with strict dieting promote binge eating) and are considered to be directly linked to concerns regarding shape and weight. The transdiagnostic model includes the proposed additional maintaining mechanisms of core low self-esteem, clinical perfectionism, mood intolerance and interpersonal 'life' difficulties (Fairburn et al 2003). Comprehensive data has yet to be published regarding the efficacy of this adapted model. However, an initial report has indicated that it may be considerably more effective than the prior manual-based treatment (Fairburn et al 1993; Fairburn 2004; Wilson 2005).

Briefly, CBT treatment for BN based on the Fairburn et al (1993; 2003) model is a structured intervention with three planned stages which are designed to be cumulative. Across the stages there is shift in focus from being primarily centred upon addressing problematic eating behaviour (e.g. through structured eating) to a cognitive focus addressing problematic thoughts about body shape and weight. The third stage is focused on preventing relapse and developing a maintenance plan. The extended version of CBT based upon the transdiagnostic model (see Figure 1) includes modules to address the four proposed additional maintaining mechanisms. The relevant modules are applied when there are clear difficulties with the relevant mechanism that are related to the core psychopathology of the disorder (Fairburn et al 2003).

Figure 1: the transdiagnostic model of eating disorders (adapted from Fairburn, Cooper & Shafran 2003 and Dalle Grave 2005)

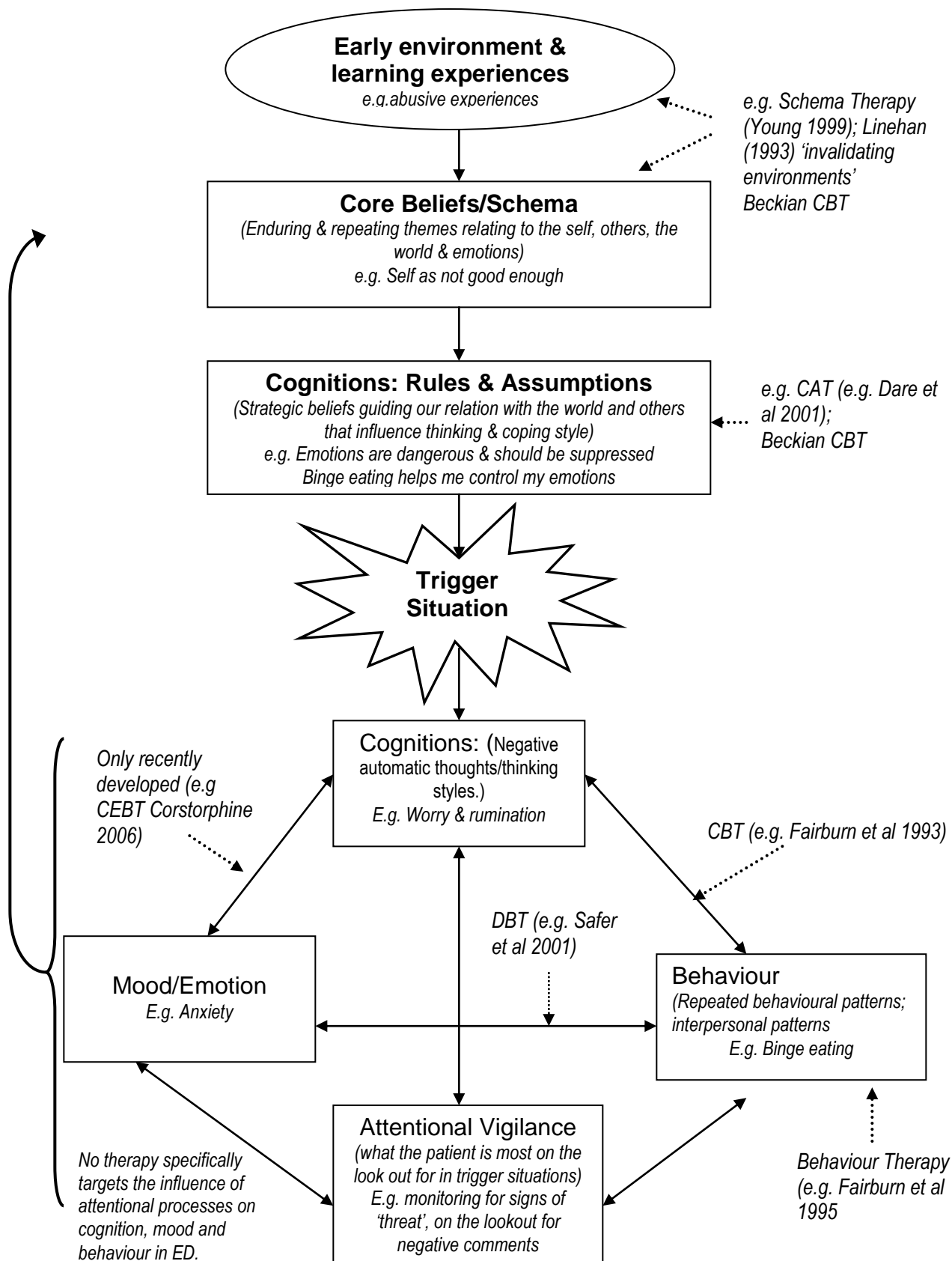


### *2.3.3 Consequences of a transdiagnostic view of eating disorders*

The transdiagnostic model represents advancement to the cognitive behavioural theory and treatment for ED (Wilson 2005). The model attempts to account for the key maintaining processes, which set the stage for further treatment advancements. To this end, recent accounts and treatment protocols have been developed for addressing mood intolerance in ED (Corstorphine 2006) and clinical perfectionism (Shafran, Cooper & Fairburn 2002). However, the theoretical foundations of the transdiagnostic model remain grounded in a symptom-led categorical system, with additional formalised therapeutic modules to address identified maintaining mechanisms. Using categorical classification as a basis for therapeutic intervention has been argued to compromise efficacy (First et al. 2004) as limited efforts have been made to evaluate the clinical utility of diagnostic categories. Essentially, attempts to classify the content of people's experience into diagnostic groupings may be less valid than attempting to understand the processes behind the experience. There may be benefits in broadening the focus further from a transdiagnostic to a transtheoretical account that encompasses theories attempting to explain cognitive and behavioural processes common across psychopathology, including ED. This would include attentional, memory and reasoning processes (Harvey et al 2004).

To illustrate this and draw a contrast with CBT maintenance models of ED (e.g. Fairburn et al 2003), it may be relevant to put forward a psychological formulation-based account of the functional processes involved in eating behaviour, informed by a number of explanatory models. This is presented in Figure 2. This illustration also shows therapies that have been previously implemented to address the various points of the model. Theoretical models incorporated into the conceptualisation, considered to be relevant to understanding the links between cognition, emotion and behaviour in ED will be outlined below. This conceptualisation differs from the transdiagnostic model in that it attempts a shift from the symptom-focused behaviours required for an ED diagnosis, to an attempt to understand ED behaviour as the primary means of managing internal or emotional experience.

Figure 2: an overview of links between cognition, emotion and behaviour with examples of theoretical accounts & treatments used to address specific features (adapted from Keville, Byrne, Tatham & McCarron unpublished; and Corstorphine 2006)



The conceptualisation presented in Figure 2 attempts to outline the underlying function of ED behaviour (i.e. binge eating or dietary restraint) as a way of avoiding or managing negative experiences which one may be hyper-vigilant towards. The theoretical links between the key perpetuating factors of ED proposed in the above conceptualisation will now be addressed.

#### *2.3.4 What are the links between pathological eating behaviour and emotion?*

This conceptualisation aims to highlight functional links between emotion and eating behaviour (Agras & Telch, 1998; Meyer, Waller & Waters 1998). There is good evidence that problematic eating behaviour operates as a coping strategy for managing emotion. For example, there are clinical indications that both positive and negative emotions can act as antecedents, triggers and consequences of binge eating (Arnow, Kenardy & Agras 1992; Masheb & Grilo 2006). Control over one's emotions is also a central aspect in the aetiology and maintenance of eating pathology (Fairburn et al 1999; Cooper 2003), as is the difficulty in tolerating affect (Fairburn et al 2003; Linehan 1993) and patient's difficulties with emotional engagement and accurate identification of emotions (Corstorphine 2006).

#### *2.3.5 How does eating behaviour function in the management of negative cognition and regulation of emotion?*

The process of using binge eating and food restriction in response to emotional distress have been put forward within the "blocking" model, in which eating behaviours are suggested to have a short term blocking function to keep intolerable affect outside of awareness (Root & Fallon 1989). The 'escape from awareness' model (Heatherton & Baumeister 1991; Baumeister, Heatherton & Tice 2001) suggests that binge eating occurs as a motivated attempt to reduce or remove negative self-focus and reduce awareness of cognitions and emotional states that the individual finds intolerable. The concrete behaviour of binge eating is suggested to function to narrow the focus of cognitive attention from the abstract level of self-evaluation (e.g. "I'm a failure") and affect associated with this, to the more immediate stimulus environment (e.g. the sensations of eating). Cognitive

suppression (e.g. dissociation) might also serve this function (Vanderlinden, Vandereycken, van Dyke & Vertommen 1993).

A theoretical model which holds the avoidance of negative unwanted experience at the centre of the cause and maintenance of psychopathology is Relational Frame Theory (RFT) and the therapy derived from this, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson 1999). ACT is a part of the 'third wave' of cognitive behaviour therapies (after behaviour therapy and cognitive therapy); a theoretical movement that makes use of acceptance and mindfulness processes (Hayes 2004; Hayes, Follette & Linehan 2004). Experiential avoidance has been put forward as a transdiagnostic process (Hayes, Wilson, Gifford, Follette & Strosahl 1996; Hayes et al 1999; Harvey et al 2004). This refers to a cognitive-behavioural process in which an individual is unwilling to remain in contact with their undesirable internal private events (e.g. negative memories or thoughts). There are two modes of expression; either behavioural suppression of experiences or cognitive and emotional distancing from situations and contexts that may give rise to the aversive experience. Experiential avoidance, together with ineffective behavioural and cognitive emotional control strategies (e.g. dietary restriction in ED) have been implicated in the aetiology and maintenance of eating pathology (Heffner, Sperry, Eifert, & Detweiler 2002; Heffner & Eifert 2004).

### *2.3.6 How might early experience impact on cognition, emotion and behaviour?*

The theories outlined above suggest that disordered eating behaviours serve a specific 'coping' function for controlling and regulating negative affect. In exploring how these avoidant-based strategies might be set up, one needs to first consider environmental factors that may give rise to them and how this may influence cognitive style. Invalidating environments (Linehan 1993; Corstorphine 2007) and an associated critical parenting style or parental coping characterised by a lack of emotional expression (Corstorphine 2006), traumatic and abusive experiences (Corstorphine, Waller, Lawson & Ganis 2007) are all implicated in the development of problematic ways in which people learn to manage and express their emotional experience. This is thought to be due to the impact of negative early experience on developing problematic schemata about the self, world and others and the way to manage emotions (Young 1999; Linehan 1993). In order to

manage this, strategies and processes of avoidance may be set up (Hayes et al 1999; Hayes et al 1996). Eating behaviour may serve this function (Heatherton & Baumeister 1991; Baumeister, Heatherton & Tice 2001; Root & Fallon 1989). The individual may also become automatically more attuned to information that fits with, and thus confirms their developing schema and core beliefs (Quinton 2004). In a situation where the person's schemata or assumptions are activated, and distressing affect is triggered, these processes of avoidance (e.g. binge eating) may come into operation.

### *2.3.7 What might be the links between attention, cognition, emotion and behaviour?*

Models attempting to explain the link between emotion and ED symptomatology intimate that attentional processes may be a feature in the persistence of the disorders. For example the 'escape' hypothesis (Heatherton & Baumeister 1991; Baumeister et al 2001) suggests that binge eating functions to reduce the person's focus of cognitive attention. This implies that an individual may initially focus their attention on information or stimuli that evokes distress for them and thus the need to 'escape'. Models such as the Self-Referent Executive Function model (S-REF; Wells & Matthews 1994; Wells 1997; 2000) highlight the role of attentional processes in the development and maintenance of emotional disorders, including ED (Cooper, Wells & Todd 2004; Cooper 2003). The model proposes that sets of self-beliefs and procedural plans or 'maps' of being are set up and stored in long-term memory. Subsequently people will engage in monitoring for information that is consistent with and confirms these beliefs and plans (e.g. commonly internal state information such as thoughts, physical feelings and mood). This process prevents attention being given to new information that may contradict the beliefs or disrupt the ongoing behaviours, thus maintaining the experience of distress.

### *2.3.8 What information do people attend to and how might this be related to their psychological disorder?*

Models in addition to the S-REF have proposed that people may attend to information that provides a good fit with their beliefs and current concerns (Klinger 1996; Lavy & van den Hout 1994). This is



largely because limited cognitive resources lead an individual to select information that is of most relevance to them and their daily functioning (reviewed in Harvey et al 2004). It has been demonstrated that in general, people are distracted by positive or negative emotional stimuli over other types of information (Kinderman, Prince, Waller & Peters 2003; Martin, Williams & Clark, 1991; Spinks & Dalgleish, 2001). However, negatively valenced stimuli have been suggested to attract attention over that with a positive valence, in other words 'bad is stronger than good' (Baumeister, Bratslavsky, Finkenauer & Vohs 2001; Taylor 1991). As such it would appear that there is a certain inherent bias toward negative emotional stimuli, particularly so when the information is of personal relevance.

Selecting information in line with one's personal concerns might account for the differences in the expression of particular disorders. Within ED, according to the cognitive model (Fairburn 1997) an individual's current concerns can be expected to be in line with information pertaining to shape, weight and eating. More specifically, a person with AN whose concern is to achieve weight loss (and thus avoid weight gain) may focus their attention on any perceived signs of weight gain. If these were detected, emotions such as disgust and fear may be triggered, leading that individual to become more focused on further weight loss and food avoidance, possibly as a means to manage these feelings (Harvey et al 2004). Alternatively, a person with social phobia may selectively retrieve from memory negative information about social circumstances that fits with their negative social view of themselves. Processes of rumination about performance prior to a social situation and an internal self-focus while in the situation (i.e. on symptoms like trembling and sweating) are likely to exacerbate the individual's symptoms of anxiety. Ultimately avoidance of social situations (or avoidance within them like avoiding eye contact) maintains the anxiety as the individual receives no information with which to disconfirm their beliefs (Clark & Wells 1995).

Attentional processes have been implicated in the development and maintenance of several emotional disorders, for example Panic Disorder, Generalised Anxiety Disorder (Wells, 1997; 2000), Obsessive Compulsive Disorder (Salkovskis, Forrester, & Richards 1998), Specific Phobia (Arntz, Hildebrand & van den Hout 1994) and Depression (Papageourgio & Wells 2003) as well as ED.

*2.3.9 If people are biased toward negative information that provokes distress, might they also try to avoid it?*

It is possible to make theoretical links between the propositions of models such as the S-REF (Wells & Matthews 1994; Wells 1997; 2000), the 'escape' model of binge eating (Heatherton & Baumeister 1991; Baumeister et al 2001), ACT (Hayes et al 1999) and disorder-specific CBT models (e.g Clark & Wells 1995) to generate ideas regarding the links between attention and avoidance. For example, if an individual automatically attends to information that confirms their negative beliefs (i.e. monitoring a social situation for signs of perceived social 'failure'), then when this information is detected the person is likely to feel high levels of emotion (i.e. anxiety). The emotional state itself may be considered aversive (i.e. taken as a sign of imminent danger) leading the person to leave the situation, avoid it for future, thus confirming their belief in the danger of the event. This has the long-term consequence of reinforcing the person's beliefs as due to avoidance, no disconfirmatory information is provided and so the avoidance cycle is perpetuated (Clark & Wells 1995).

Conceptualisations of eating pathology such as the 'escape from awareness' (Heatherton & Baumeister 1991) and 'blocking' model (Root & Fallon 1989) suggest that when an individual's attention is drawn to information that promotes states of emotional distress, the eating behaviour can function as a form of cognitive-behavioural avoidance that enables the person to shift the focus of their attention away from the threat and thus regulate their emotion. So in regaining control over emotions via food restriction or suppressing emotion by binge-eating, an individual gains a sense of mastery over their distressing emotions and thoughts (Heffner et al 2002; McManus & Waller 1995).

Many of the behaviours exhibited by people with eating disorders can be viewed as avoidant strategies. The clearest example of this is when restricting calorie intake, people will actively avoid fattening foods and attempt to 'escape' from situations in which they are uncertain of the calorie content of food. Avoidance of one's body and appearance is common, including refusal to be weighed and wearing baggy clothes to disguise body shape (Shafran, Fairburn, Robinson & Lask

2004). It is possible to conceptualise these behaviours as dysfunctional anxiety management strategies or 'safety behaviours' to avoid weight gain (Harvey et al 2004).

Other forms of avoidant coping might include cognitive suppression, such as dissociation (Vanderlinden, Vandereycken, van Dyke & Vertommen 1993), ruminative processes where the function is to replace highly aversive thoughts with less distressing thoughts (Wells & Davies 1994; Wells 2000; Borkovec, 1994; 2002; Borkovec, Alcaine & Behar, 2004) and distraction when used consistently to suppress experience (Keville et al unpublished). It has been suggested that beliefs about the importance of controlling thoughts may lead to the use of avoidant styles of coping (Purdon, 1999; Wells 2000).

### *2.3.10 The ineffectiveness of avoidance as an emotional regulation strategy in ED*

An individual's efforts to avoid, control and suppress experience may function to reduce their negative emotional state in the short term yet there is good evidence to suggest that attempts to regulate emotion in this way may exacerbate and perpetuate distress (Hayes, Strosahl, & Wilson, 1999). Not only is it difficult to maintain constant efforts in avoidance over the longer term, it is also indicated that attempting to avoid in this way also serves to increase the frequency and subsequent distress associated with the initial experiences (John & Gross 2004; Wegner, Schneider, Carter, & White 1987; Wegner & Zanakos 1994). For example, studies have shown the cyclical nature of attempts to suppress thoughts in the presence of an emotion, in that ultimately the emotion evokes the thought and the suppression strategies evoke both (Wenzlaff & Wegner 2000). This is why poorer long term outcomes in a range of disorders are expected for those prone to avoid and suppress experience (Purdon, 1999; Hayes et al, 1996).

This may have particular consequences for ED, as it may explain why without adequately addressing avoidant and suppressive strategies in the disorders, emotional distress may be perpetuated and may have an impact on the efficacy of treatment. Without adequate focus on attentional and avoidant processes and providing alternatives, interventions run the risk of treating

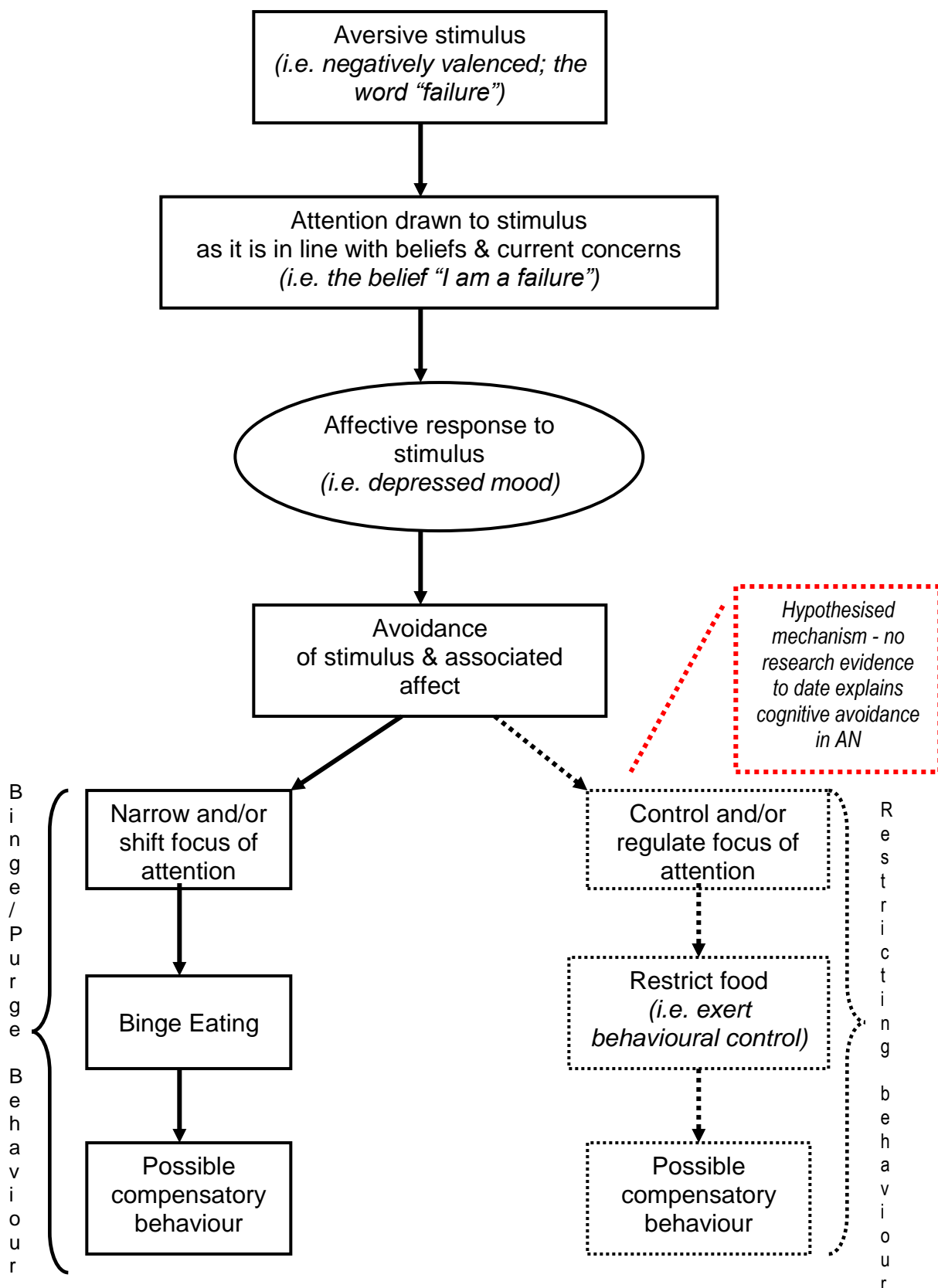
disorder-specific behaviours without acting on the underlying function of their use in attempting to regulate negative affective experience.

### *2.3.11 How processes of attention and avoidance operate together in eating disorders*

Research into processes of attention and avoidance commonly use self-report measures to assess eating-disordered individuals' attitudes toward weight, shape and eating (Bemis-Vitousek & Hollon 1990). Recent research has seen the use of experimental methods adapted from cognitive psychology. These experimental paradigms are increasingly popular as they may reduce some of the biases inherent in self-report methods and to allow processes outside of conscious awareness to be measured. Many authors have commented on the utility of cognitive-experimental paradigms to increase the understanding of the cognitive processes involved in eating disorders (Bemis-Vitousek & Hollon 1990; Cooper 1997; 2005; Williams, Mathews & MacLeod, 1996).

Research along these lines has suggested that people demonstrating eating pathology process information relevant to their current concerns in two main ways. There is an initial lowered threshold for identifying and filtering salient stimuli relevant to the disorder (i.e. attentional bias). This has led to suggestions that eating-disordered individuals may be predisposed in some way to seek out stimuli relevant to their specific concerns (Ainsworth, Waller & Kennedy 2002; Davidson & Wright 2002; Dobson & Dozois 2004; Faunce 2004; Lee & Shafran 2004; Rofey, Corcoran & Tran 2004; Waller, Quinton & Watson 1995). It is then suggested that individuals are unable to sustain this initial attention and thus engage in cognitive (e.g. thought suppression) or behavioural processes (e.g. binge eating) to avoid the threat and the affect associated with it (Israeli & Stewart, 2001; Meyer, Waller & Watson 2000; Meyer, Serpell, Waller, Murphy, Treasure & Leung 2005; Waller & Meyer 1997). Drawing this all together, the links between these processes might be diagrammatically illustrated as in Figure 3 below.

Figure 3: diagrammatic representation of the hypothesised mechanism between attentional bias and cognitive avoidance



## 2.4 How might attentional bias function in ED?

Despite the proposed importance of the processes of attentional bias and cognitive avoidance suggested in the models reviewed here, the research on these topics is limited. The two processes themselves and the existing research evidence shall be discussed in turn below.

### *2.4.1 Attentional bias in the eating disorders*

An attentional bias refers to a cognitive filtering process which occurs when one stimulus gets priority in terms of processing over others (Harvey et al 2004). Biases in attention found in individuals with eating pathology have been likened to that observed in anxiety disorders (Ainsworth, Waller & Kennedy 2002; Dobson & Dozois 2004; Faunce 2002; Lee & Shafran 2004; Williamson, Muller, Reas & Thaw 1999).

Although the research is limited, biases in attention have been found for information that is specific to the eating pathology for example for words and pictures related to food, weight and body shape (Ainsworth, Waller & Kennedy 2002; Cooper & Fairburn 1993; Davidson & Wright 2002; Dobson & Dozois 2004; Fairburn, Cooper, Cooper, McKenna & Anastasiades 1991; Faunce 2004; Lee & Shafran 2004; Prato & John 1991; Rofey, Corcoran & Tran 2004; Shafran, Lee, Cooper, Palmer & Fairburn 2007; Waller, Quinton & Watson 1995). More recently, some very limited evidence has indicated that individuals with symptoms of eating pathology may display attentional biases to information beyond disorder-specific parameters, particularly for threat information related to social anxiety and self-esteem (McManus, Waller & Chadwick 1996; Meyer, Waller & Watson, 2000; Meyer et al, 2005; Waller, Watkins, Shuck & McManus, 1996; Waller & Meyer, 1997).

The majority of this research uses a modified emotional Stroop task (Stroop 1935; Williams, Mathews & MacLeod 1996). The emotional Stroop has its origins in the field of anxiety disorders (Williams et al 1996). However, disorder-specific variants of the emotional Stroop test have now been developed and have been used to indicate attentional biases in a number of other disorders.

It remains a popular experimental paradigm to assess attentional bias; a recent PsycINFO search revealed 3084 studies using versions of the Stroop paradigm (search conducted April 2007).

#### *2.4.2 The 'Stroop Effect': a brief overview*

The classic Stroop task (1935) was based upon two conditions; a colour-congruent condition in which the colour word presented (i.e. the word 'red') was written in the same ink colour (i.e. written in the colour red) and a colour-incongruent condition in which the colour word presented (i.e. the word 'red') was written in a conflicting ink colour (i.e. the colour blue). Participants were instructed to name the ink colour the word was printed in, while ignoring the meaning of the word. The 'Stroop effect' refers to the greater response times commonly found for the colour-incongruent words than the colour-congruent words. This is thought to arise from a conflict in processing between the ink colour and the word meaning (Cohen, Dunbar & McClelland 1990; Mathews & MacLeod, 1994; Stroop, 1935).

Within the modified version, word meaning is unrelated to ink colour, therefore the conflict in processing does not occur in the same way as in the classic Stroop task. Participants are asked to name the colour of disorder-related words (e.g. the word 'panic') and of neutral words (e.g. the word 'paint') as quickly as possible. The test measures the difference between the participant's response time for the emotional stimuli and their response time for neutral stimuli. This indicates how a participant's performance is affected by the attentional bias to semantic aspects of the stimulus that should be ignored during the task. Participants consistently show longer latencies for disorder-specific words (Williams, Mathews & MacLeod, 1996) suggesting difficulties in ignoring the emotional content of the stimuli, particularly if it is relevant to their current concerns (Mathews & MacLeod, 1994; Matthews & Wells, 2000; Wells & Matthews 1994). This may be a result of the relationships that have been set up between a word and an experience that triggers an emotional reaction (Hayes, Barnes-Holmes & Roche 2001).

### *2.4.3 Limitations of the current research exploring attentional bias in eating disorders*

A major limitation of the research to date is the limited amount of studies exploring the process of attentional biases specific to eating disorders (Shafran et al 2007; Harvey et al 2004). The studies of attention have tended to group the various eating disorder subtypes together which may mask important differences between them (Harvey et al 2004), for example attentional differences in those who restrict their intake in comparison to those who binge. Other shortcomings include the reliance on non-clinical populations displaying disordered eating or symptoms of eating pathology such as bulimic behaviours (Dobson & Dozois 2004). The research into selective attention in ED is also limited in terms of the predominant focus on ED specific cues (e.g. food and body word stimuli) as opposed to considering attentional processes to other stimuli that might reflect underlying concerns related to beliefs, such as threats to one's self-esteem (e.g. 'failure'; McManus et al 1996).

The Stroop task has also been challenged as a measure of selective attention, as it is suggested that the longer latencies might be caused by factors other than a bias in attention, such as an emotional reaction or preoccupation with the word cue (Harvey et al 2004; Lee & Shafran 2004). It has also been proposed that increased latencies for particular words may reflect attempts by the individual to suppress the threatening meanings and associations of the word. As such it has been argued that the emotional Stroop may in fact be measuring cognitive avoidance (de Ruiter & Brosschot 1994; Lavy & van den Hout 1994). The Stroop task has been criticised for not being able to effectively differentiate that the observed effect is due to attention oriented towards the threat stimulus (i.e. attentional bias) or attention diverted away from it (i.e. cognitive avoidance). However, other tasks put forward as alternatives to the Stroop have been found to be subject to similar criticism in terms of their ability to distinguish between these processes (Mogg & Bradley 1999). It has also been suggested that cognitive avoidance and attentional bias are related and interdependent processes and thus difficult to tap into separately (Lavy & van den Hout 1994).



#### *2.4.5 Methodological limitations of the modified emotional Stroop task*

A number of commentators have drawn attention to some methodological issues of concern specific to the emotional Stroop task for ED (Faunce 2002; Lee & Shafran 2004; Dobson & Dozois 2004). These are primarily related to the nature of the stimuli used and the presentation and recording of stimuli, which it is suggested future research needs to take into account (Cox, Fadardi & Pothos 2006).

*a) Nature of emotional Stroop Stimuli:* There has been some variation in terms of mixing semantic categories (i.e. eating, shape and weight words presented together as one 'eating disorder' category; e.g. Cooper, Anastasiades & Fairburn 1992) or separating them as different semantic categories (e.g. Cooper & Todd 1997). It is important for future research to address this and match the semantic relatedness of the words used (e.g. if threat stimuli used belongs to two semantic categories, the neutral stimuli should also belong to two categories). This enables one to more reasonably argue that differences in latency are related to the disorder-salient categories rather than the neutral categories of the stimulus information.

It has been found that words closely linked to colours (e.g. 'sky', 'grass', 'banana') produce greater latencies (Macleod, 1991) and are suggested to be avoided in word selection. There is evidence to suggest that words appearing more frequently in a language result in increased response times (Burt, 2002 in Cox et al 2006). Therefore this dimension needs to be carefully attended to when selecting stimuli to ensure that longer latencies can be attributed to the relatedness of the stimuli to ED concerns. The linguistic properties of stimuli for selection should be carefully considered, including the word length (number of letters), syllables, the number of words used and their semantic relatedness (McManus et al 1996).

*b) Presentation & recording of stimuli:* In the literature to date (see reviews by Faunce 2002; Lee & Shafran 2004; Dobson & Dozois 2004; Harvey et al 2004) the presentation of stimuli and method of recording response times has varied. Stimuli have traditionally been presented on cards in blocks of words or in single word presentations and times recorded by the investigator with a stopwatch

(e.g. Ben-Tovim, Walker, Fok & Yap 1989). This is problematic in terms of accuracy and introduces experimenter effects into the study design. Recent studies have employed computerised or keyboard activated presentation and recording (e.g. Davidson & Wright 2002). Computerised presentation has many methodological advantages, including the ability to randomly present stimuli and the minimisation of experimenter involvement. Computerised presentation of stimuli and recording of response times is recommended for future research.

## 2.5 How might cognitive avoidance function in ED?

### *2.5.1 Studies of cognitive avoidance in ED*

As mentioned previously, cognitive avoidance can be used to broadly describe a range of covert processes which may include thought suppression (Johnston, Bulik & Anstiss 1999; Oliver & Huon 2001; O'Connell, Larkin & Mizes 2005), distraction (Keville et al unpublished), dissociation (Vanderlinden et al 1993) and processes such as worry and rumination (Mizes et al 2000; Waller 2003; Waller et al 2003). Processes of cognitive avoidance could be reasonably encompassed by the concept of experiential avoidance (Hayes et al 1996; 1999) which takes into account avoidant forms of coping such as attempts to escape stressful experiences (i.e. avoidant coping), to become separate from aversive events and accompanying emotions (e.g. detached coping), or to inhibit the expression of emotions (e.g. emotional suppression).

In contrast to the literature investigating the role of attentional bias in eating pathology, even fewer studies have been conducted investigating processes of cognitive avoidance. Studies using self-report methods have found that women with eating disorders are more likely to engage in rumination and cognitive avoidance as coping strategies than women without an eating disorder (Troop & Treasure 1997; Troop, Holbrey & Treasure 1998). Experimental studies have expanded on this by using cognitive processing paradigms. However the conclusions drawn from this research are limited by the predominant use of non-clinical populations. For example, in a computer driven word recognition test involving neutral words and unspecified 'threat' words (Waller, Quinton & Watson 1995), women with higher bulimic attitudes (measured via

questionnaire) were slower to recognise threat words. No such effect was found for participants displaying restrictive attitudes. In a further computer driven task (Meyer, Waller & Watson 2000), female college students displaying eating pathology on a self-report measure were presented with threat and neutral word stimuli with varying intervals between the presentation of the stimuli (i.e. intervals of 500, 1000, 1500, 2000 milliseconds). Participants with higher bulimic attitudes on the questionnaire were slower to process the threat words after the longer trial interval (i.e. 1500-2000ms), suggesting that the longer they were required to engage with the stimulus the more they sought to avoid it. No associations were found between participants with restrictive features on the questionnaire and the speed of response to threat (Meyer et al 2000).

Most recently, researchers have used strategic processing tasks to measure cognitive avoidance. This has involved the solution under timed conditions of single-word anagrams for food (e.g. 'cake'), self-esteem threat (e.g. 'fail') and neutral words (e.g. 'your'). Using this paradigm with a college sample, Waller & Meyer (1997) found no associations found between the anagram solution times for food or threat words and eating pathology scores as measured by the self-report inventory. In the second stage of this study, threat words in comparison with neutral words were focused upon. No associations were found between the threat words and features of eating pathology. However a significant relationship was found between solution times for the anagrams related to threats to self-esteem and the 'ego development' scales of the questionnaire (i.e. those measuring personal ineffectiveness and social insecurity).

Using this paradigm with a mixed clinical ED population, Meyer et al (2005) found that bulimic individuals took longer to process the self-esteem threat anagrams than controls. There were no differences in anagram solution time observed for the food related words, indeed there was an inclination across the groups to process these food words more rapidly, particularly among the restrictive anorexic group. This may suggest that processing of food related concerns is a more general process, rather than one indicative of pathology that may be common across individuals.

### *2.5.2 Limitations of the current research exploring cognitive avoidance in eating disorders*

The studies by Waller & Meyer (1997) and Meyer et al (2005) lend some support to a proposition within the 'escape' model (Heatherton et al 1991) that threats to self-esteem (termed ego-threats) might be more relevant in the development of eating psychopathology than disorder-specific threats related to food. While these effects have been demonstrated somewhat in individuals with bulimic features, very little is known about the way the cognitive process of avoidance occurs in AN. One might expect this to function differently, as those with restrictive eating do not use binge-eating to shift the focus of their attention (see Figure 3). Indeed, this research found the strongest patterns of avoidance amongst females with bulimic pathology, and found that those with AN restrictive pathology actually processed food-associated stimuli more rapidly (Meyer et al 2005). The picture for AN is far from clear and further exploration is required in the research.

It is clear that there is little empirical evidence available investigating cognitive avoidance with a clinical eating disorder sample. In general, the evidence base for the presence of cognitive avoidance in eating disorders is at an early stage. There is scope for refinement and development of the paradigms and for exploring the processes within eating disorders other than BN to examine if cognitive avoidance is a process which can be found across eating pathology.

### 2.6 Contribution of the present study to understanding to role of attentional bias and cognitive avoidance in eating disorders

As indicated by the conceptualisation in Figure 2, if one proposes that particular attentional and avoidant processes function to predispose and maintain eating disorders, then it is crucial to provide solid evidence that these processes are present in the disorders. To this end the two processes of attentional bias and cognitive avoidance, with hypothesised links between them (de Ruyter & Brosschot; Lavy & van den Hout) were decided upon for investigation in the present study. The overall goal of the present research was to establish whether patients with eating disorders demonstrate these cognitive processes for eating, shape/weight and self-esteem threat stimuli and if so whether this process is one specific to patients with eating disorders.

Attentional bias followed by subsequent cognitive avoidance of disorder-relevant threats has been suggested to be present in participants with eating-disordered behaviour. Currently the research into these processes is limited. As outlined, there are methodological weaknesses within some of the studies which need to be addressed where possible (see Sections 2.4.3, 2.4.4 and 2.5.2). This study aimed to utilise a computerised version of the modified emotional Stroop to contribute to a growing evidence base and address some of these weaknesses.

The modified Stroop paradigm was chosen as it represents the most widely utilised paradigm proposed to assess attentional bias, allowing for the comparison of 'disordered' samples with normal controls in a task that affords tight experimental control. It is acknowledged that other paradigms exist which also offer ways in which to measure attentional bias. The dot-probe paradigm has been suggested as an alternative measure of attentional bias and has been used with ED samples (Shafran et al 2007; Lee & Shafran 2004). However, the research is limited at this time and questions have arisen as to the reliability of the dot-probe task in effectively measuring attentional allocation, leading to inconsistent findings in the literature (Fox et al 2002; Schmukle 2005). In order to balance the use of a relatively novel proposed measure of cognitive avoidance, it felt important to make use of a well researched measure of attentional bias such as the Stroop. The decision to use the Stroop task was also affected by some of the pragmatics of this study, for example the degree of sophistication of the programming software available.

While attentional biases have been consistently found predominantly in the domains of food and body shape stimuli within the Stroop research, it has been noted that there is still a lack of evidence for selective attention to emotional stimuli (Dobson & Dozois, 2004). By using self-esteem threat cues within the proposed measure of attentional bias, this study attempted to address this limited evidence. The literature presented within the Introduction has highlighted shortcomings in the earlier Stroop research in that grouping the sub-types of ED together may mask key differences between them. Evidence has also been presented that indicates that processes of attentional bias may also be different in AN and BN individuals. To address this, the current study aimed to explore

the role of eating-disordered behaviour (i.e. binge-purge or restricting) on attentional bias and cognitive avoidance.

To contribute to the theory for the role of processes of cognitive avoidance in the maintenance of eating disorders it is essential that more research is conducted. At present the research base is inadequate to draw any conclusions regarding the presence of cognitive avoidance in eating disorders. Little is understood about the process within a clinical group, particularly with individuals with AN or atypical eating disorders. In the first instance, this study attempted to address this by targeting a population across ED diagnoses. Attempts were then made to explore the effect of different ED behaviours as moderators of cognitive avoidance.

Studies using strategic processing tasks should be conducted to attempt to distinguish between selective attention and cognitive avoidance. This study aimed to address some of the limitations of previous research using paradigms proposed to measure cognitive avoidance by using a computerised modification of an anagram solution task (Waller & Meyer 1997; Meyer et al 2005). This task involves participants solving threat-related or neutral anagrams. The hypothesis underlying the task proposes that if cognitive avoidance of threatening information occurs, then participants will be slower at solving these anagrams. It has been highlighted that concerns other than those of food, weight and body shape may have more relevance in cognitive avoidance among eating-disordered individuals. Further work considering the importance of avoidance of threats to self-esteem (Heatherton & Baumeister, 1991), using strategic processing tasks will be useful to demonstrate this.

This study attempted to explore experiential avoidance in eating disorders, as this has close links and indeed is likely to subsume cognitive avoidance. As such, the current study is one of the first using an experimental paradigm and a self-report measure to explore the presence of experiential avoidance in an eating disorder population. It has been acknowledged that further empirical research into experiential avoidance is needed, in particular with people with eating disorders (Hayes & Pankey, 2002).

The specific research questions will be stated below, after outlining the potential clinical benefits of the current study.

### *2.6.1 Clinical implications of the proposed study*

Research into these types of cognitive processes across the eating disorders may have important implications for the future development of relevant theoretical models by looking at eating disorders from a transtheoretical standpoint. This may further increase our understanding and improve treatment outcomes. Establishing evidence for the role of cognitive avoidance in eating disorders may provide support for treatment approaches such as ACT that emphasise acceptance of previously avoided negative private events as a key route to recovery. It is acknowledged that exploring these processes transdiagnostically has the potential to obscure differences between those who use binge-eating and those that do not. In an attempt to explore this, the role of ED behaviour as a moderator in the cognitive processes was explored. It is hoped that this study will add further weight to the findings that cognitive concerns other than those of food, weight and body shape (Fairburn, 1997; Fairburn et al., 2003) are relevant in the development and maintenance of eating pathology (Baumeister et al, 2001; Heatherton & Baumeister, 1991, Cooper, 2005). This will be useful for advancing the theory around cognitive content in eating disorders.

Experimental paradigms have strengths in the ability to capture discrete cognitive processes that are not as readily accessed by measures such as self-report. However, it is acknowledged that the modified Stroop paradigm and anagram task are proxy measures of the processes of attentional bias and cognitive avoidance and as such certain suppositions must be made in order to relate the findings to clinical practice. In drawing conclusions about the clinical relevance of this research, theoretical extrapolations from these lower order cognitive processes may be made in order to develop links with clinical presentations. For example, it may be that the modified Stroop task relevant to ED captures a bias towards weight and shape related material that can be observed in clinical practice (e.g. the tendency for ED individuals to give greater attention to media that reflects a thin ideal body type). The Stroop task may also reflect the tendency for ED individuals to

selectively attend more to social comments or interactions that confirm their negative beliefs about themselves.

The anagram solution task may reflect what follows on from this initial vigilance to personally salient information. It is possible that in the process of completing this task, a participant may be more attuned to a target stimulus anagram beyond conscious awareness, yet seek to avoid the solution of the word as they find it threatening. Anecdotally, those with ED appear to either be very connected to their initial experience and find this so painful that they engage in attempts to avoid contact with it (i.e. through binge eating or self-harm) or they are so adept at avoiding they appear disconnected or unaware of their experiences to the point of having no language with which to describe them. Often at the beginning of therapy it is important to be aware of the way in which an individual engages with emotional and interpersonal experience. It may be necessary to point out that 'things may get worse before they get better' as they begin to connect and work through issues in therapy. A strategic task such as the anagram solution task may prove a useful clinical tool to identify whether processes of cognitive avoidance are pertinent for an individual with ED and help to inform a treatment package that may address this.

Addressing the content of negative automatic thoughts is a key part of existing CBT treatments for ED and is possibly why attentional biases to weight and shape stimuli have been found to reduce following CBT treatment (Carter, Bulik, McIntosh & Joyce 2002). However, clinical experience suggests a focus on the initial attentional processes involved may also be relevant to treatment and improve outcomes. The use of paradigms such as the Stroop may highlight the benefits of attentional training interventions for eating-disordered patients (Davidson & Wright 2002; Wells 2000).



## 2.7 Experimental Hypotheses

### *2.7.1 Experimental hypotheses related to the attentional bias paradigm: the modified Stroop task*

As outlined above, attentional bias has been found in eating-disordered participants in previous research, particularly for disorder relevant stimuli but the evidence base is small and has methodological limitations. Attentional biases have been indicated for stimuli thought to relate to underlying beliefs (e.g. threats to self-esteem), although again this research is limited. For this reason, it was decided to investigate attentional biases to disorder relevant and self-esteem threat stimuli using a computerised version of the modified emotional Stroop task. Research using clinical ED samples is also limited and for this reason participants of this nature were chosen as a target population, with a matched comparison group. There were specific experimental hypotheses to explore attentional bias in ED, as follows;

- *Hypothesis 1:* Female participants with an eating disorder will have slower response times (indicating attentional bias) for naming the colour of three categories of word (food, body and negative self-esteem threats) in relation to neutral words.
- *Hypothesis 2:* Female participants with an eating disorder will have slower response times for naming the colour of disorder relevant and threat words than a non-clinical comparison group of females.
- *Hypothesis 2a:* Furthermore, no differences in response times were expected between the clinical and control groups for the neutral Stroop stimuli.

### *2.7.2 Experimental hypotheses related to the cognitive avoidance paradigm: the anagram solution task*

The research exploring cognitive avoidance is minimal and has only focused on food and ego threat stimuli. Only one study has explored cognitive avoidance with a clinical sample. For these

reasons a computerised strategic anagram solution paradigm was chosen to measure cognitive avoidance with the addition of body anagrams to bring the research more in line with that of the attentional bias literature. This was to be employed with a clinical ED sample and a comparison group without an eating disorder. Again there were specific experimental hypotheses, as follows:

- *Hypothesis 3:* Female participants with an eating disorder will demonstrate slower performance times for solving anagrams (indicating cognitive avoidance) of food, body and self-esteem threat anagrams in relation to neutral anagrams.
- *Hypothesis 4:* Female participants with an eating disorder will demonstrate slower response times for solving body, food and self-esteem threat anagrams (indicating cognitive avoidance) than a non-clinical comparison group of females.
- *Hypothesis 4a:* Furthermore, no differences in solution times were expected between the clinical and control groups for the neutral stimuli.

### *2.7.3 Hypotheses related to eating disorder diagnoses*

There has been some variation in the previous research in terms of differences in attentional biases between AN and BN participants. Cognitive avoidance has only been found in those displaying BN behaviours in the literature to date. For this reason, it was considered valid to explore the potential moderating effect of ED behaviour on attentional bias and cognitive avoidance.

- *Hypothesis 5a:* It was proposed that ED behaviour (i.e. binge-purge (B/P) behaviour or restricting (R) behaviour) may have a moderating effect on the Stroop latencies for food, body and self-esteem threat words.
- *Hypothesis 5b:* It was hypothesised that ED behaviour (i.e. B/P or R behaviour) may have a moderating effect on anagram solution time for particular food, body and self-esteem threat words.

#### 2.7.4 Additional correlational hypotheses relating to experiential avoidance

*Hypothesis 6a:* It was predicted that there would be positive correlations between experiential avoidance and selected key subscales of the questionnaires related to anxious thoughts and cognitive coping styles associated with psychopathology, as well as eating pathology for the clinical ED group. It was also predicted that these relationships may be present for the comparison group in relation to experiential avoidance and the subscales depicting content of worry and problematic efforts at coping with worry.

Experiential avoidance was measured by the Acceptance and Action Questionnaire (AAQ; Hayes et al 2004a; Appendix M). The AAQ is used to assess the tendency to make negative evaluations of private events (e.g. “anxiety is bad”), and an unwillingness to remain in contact with these events and a need to control or alter the form and frequency of internal experience. This relates to the construct of experiential avoidance within the ACT model (Hayes et al 1996).

- *Hypotheses 6b:* For the clinical ED group, it was predicted that there would be a relationship between higher experiential avoidance and performance on the Stroop and anagram tasks.

## 3. Method

### 3.1 Research Design

This study was an experimental investigation employing factorial quasi-experimental design, with within-subjects and between-subjects comparisons. A group of people with an eating disorder (ED) and a matched non-clinical control group were recruited. The clinical sample was drawn from individuals attending a local ED service and the non-clinical group were drawn from a university sample. The non-clinical control group consisted of a female university student group.

This study employed two experimental tasks as proxy measures of the variables of interest. The emotional Stroop task was proposed to measure attentional bias and an anagram solution task proposed to measure cognitive avoidance. The independent variables were the threat provoking stimuli of Stroop and anagram word category (i.e. food, body or self-esteem threat words) which represented the constructs of interest.

The dependent variables (DV) of interest were response time (latency) on the Stroop task which represented attentional bias and anagram solution time which represented cognitive avoidance.

### 3.2 Participants

#### *3.2.1 Participants – Clinical Group*

Estimates as to the total population pool available were based upon a within-service audit that suggested an approximate total of 60 active patient cases that might meet the inclusion criteria based upon weight. There was an average new referral rate to the service of 13 patient cases per month. It was necessary to establish a good working relationship with the clinical service to

effectively negotiate procedures for identifying and recruiting participants. Potential difficulties specific to recruiting ED populations were anticipated, such as low motivation, poor concentration and a relatively ambivalent relationship with services. Therefore the procedure for participant recruitment was undertaken collaboratively with the service in order to maximise recruitment without compromising clinical practice or ethics.

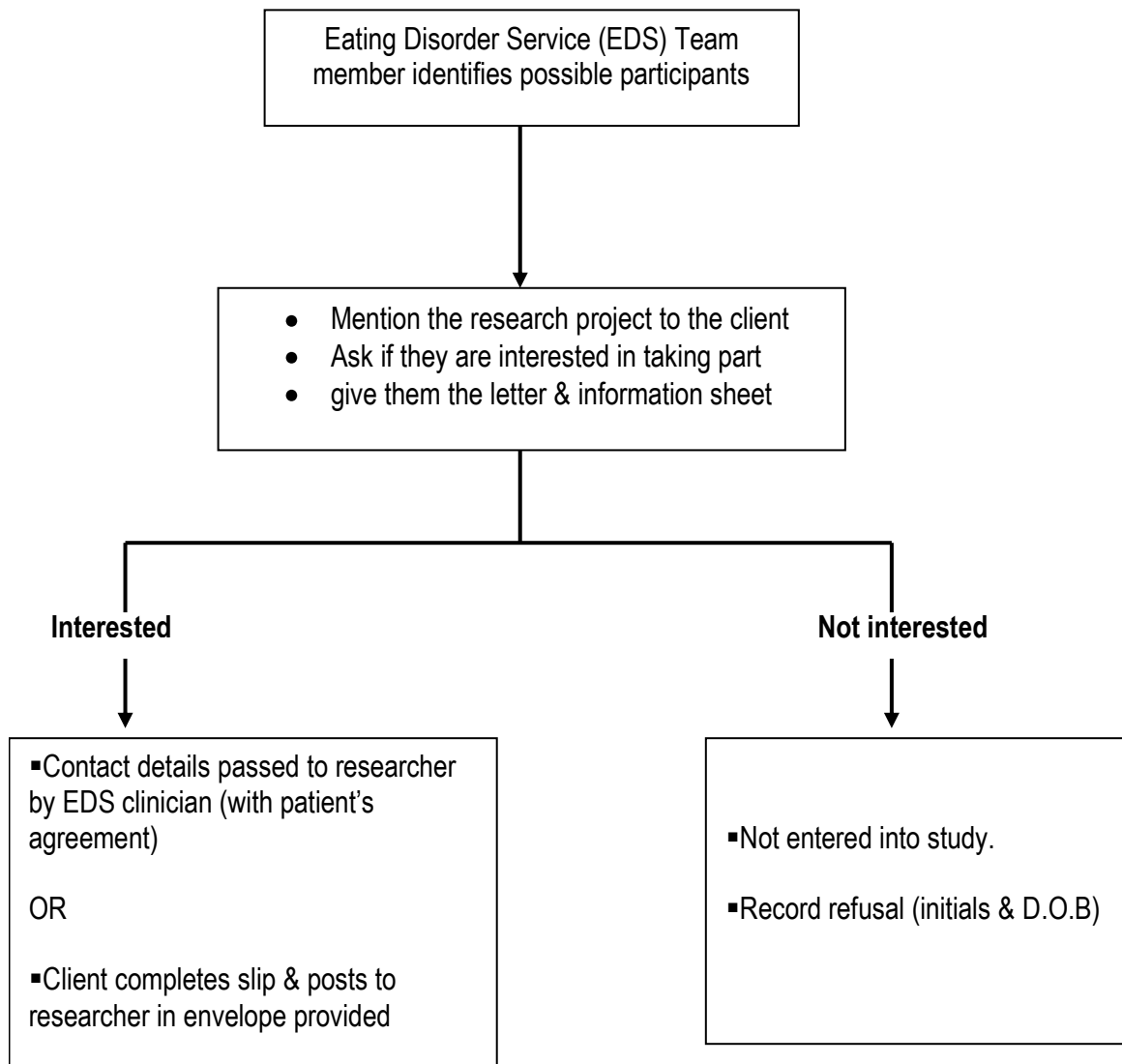
A total of 23 patients being seen by the ED service participated in the study. The experimental group consisted of females with a diagnosed ED, i.e. those displaying behaviour associated with Anorexia, Bulimia or EDNOS. The group were further split by ED diagnostic behaviour. Due to the response rate this resulted in only 15 participants in the Binge-purge group and 8 in the Restricting group. This limited the comparisons that could be made between the ED behaviour groups and the control group. 7 participants who met the criteria for inclusion into the study declined to take part. 3 of these participants declined having expressed initial interest in the study, 1 of those had disengaged from the ED service.

### *3.2.2 Recruitment – Clinical Group*

Potential participants were identified via a local NHS specialist eating disorder service. Clinical staff at the site were given information about the study and asked to consider patients for the study. Inclusion criteria for the clinical group included females aged 16 and above who were demonstrating ED symptoms of food restriction, binge eating and purging and had a Body Mass Index (BMI) of not less than 13 and not greater than 27. Additionally patients were required to be able to type using a computer keyboard. Exclusion criteria included those unable to use written English, those with colour blindness or dyslexia, with current psychotic illness or significant substance abuse which would impair their performance on the tasks. Exclusion criteria were checked via clinical notes and by asking the participants (i.e. regarding colour blindness) during the consent process.

A flowchart displaying the procedure for recruitment into the study for the clinical group is shown in Figure 4. Clinicians were asked to approach suitable patients as part of their routine contact with them to hand out an information sheet about the study (Appendix B) and a covering letter (Appendix A). Patients were asked to give their contact details and sign a form indicating their consent to be contacted by the researcher and to return the form in a self-addressed envelope to the researcher if they were interested in participating. The researcher attempted to contact the patient within one week to to arrange to meet them to discuss the research further and obtain informed consent to participate in the study, if applicable (Appendix D). All participants had the information sheet for a minimum of 3 days before being contacted.

Figure 4: flowchart displaying the recruitment procedure for the clinical ED group



### *3.2.3 Participants - Control Group*

The majority of the participants in the control group were undergraduate level students, largely recruited from psychology or related courses. A total of 41 participants signed up to take part in the study, of this number 7 did not attend, leaving a total of 34 participants in the control group.

### *3.2.4 Recruitment – Control Group*

Inclusion criteria for the control group were female university students who were within the normal weight guidelines (BMI range 20-25), were not currently dieting or displaying problematic eating behaviour (as measured by 3 subscales of the EDI 3). Additionally they were required to be able to type using a computer keyboard. The study was advertised on the university's research database and participants were recruited through course research credit procedures.

Exclusion criteria included those unable to use written English, those with colour blindness or dyslexia. This was checked with the participant in person prior to their taking part in the study.

## 3.3 Statistical Power & Sample Size

The sample size in this study was based upon a power calculation assuming a medium effect size of around Cohen's  $d = .50$  (Cohen, 1992). A medium effect size was selected based upon prior research using the disorder-specific Stroop with ED groups (Dobson & Dozois 2004). Effect sizes have not been previously reported within the research using the anagram task, therefore the conventional medium effect size was also used. The calculations indicated that for the main within-group comparison involving a threatening and neutral stimulus a sample size of 27 would be sufficient for a medium effect size with an alpha level of 0.05 (1-tailed) and a power of .80. It is of note that the clinical ED group was slightly underpowered ( $N=23$ ). However, post hoc power



calculations indicated that the power to detect a medium effect size was still sufficient to detect a medium power of 75% at an alpha level of 0.05 (1-tailed).

### 3.4 Questionnaire Measures

Questionnaire measures were chosen by being mindful of completion time and response type given potential difficulties with engagement, attention and concentration for the clinical ED group. The psychometric properties of each scale were carefully considered.

#### *3.4.1 Demographic Information & Questionnaire*

Background information about participants in both groups was recorded via a questionnaire including: age, height and current weight (to calculate Body Mass Index; BMI), first language, current employment status and educational level.

A brief questionnaire to measure current eating-disordered behaviour was administered to the clinical group, based on the Bulimic Investigatory Test-Edinburgh (BITE; Appendix H). With consent, medical notes for the clinical group were examined for background information regarding eating disorder diagnosis, co-morbid diagnosis, time since diagnosis, treatment history, prescribed medication and stage of therapeutic intervention.

#### *3.4.2 Eating Disorder Pathology: Eating Disorder Inventory 3 (EDI-3; Garner, 2004):*

The EDI-3 is a widely utilised self-report measure of eating disorder symptoms and associated psychopathology (Appendix I and J). The EDI-3 has been shown to have good internal consistency ( $r=.90-.97$ ), content and criterion-based and construct validity ( $\alpha=.80$ ) with good test-retest reliability

( $r=.98$ ). It has norms available for AN (Restricting and Binge-Eating/Purging type), BN and EDNOS individuals. Mean raw scores are available for non-clinical samples. The inventory consists of 91 items comprising 12 primary scales, 3 eating disorder-specific scales (i.e. Drive for Thinness - DT, Bulimia - B and Body Dissatisfaction - BD) and 9 general psychological scales that relate to features associated with eating disorders (i.e., Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, General Psychological Maladjustment).

Participants in the clinical group completed the questionnaire in full, whereas the control group completed the EDI-RF (Garner 2004) that comprises the 3 eating disorder-specific scales amounting to 25 items. This has been validated with non-clinical samples and has clinical utility in identifying those at risk for the development of an eating disorder. For the 3 scales of DT, B and BD, clinical range percentiles are available. It is acknowledged that a moderate DT raw score is relatively common among non-clinical adult females (79% of participants will score  $\leq 16$ ). For the B subscale, a score in the low clinical range ( $\leq 4$ ) is found in 69% of the population. For BD, it is acknowledged that scores within the typical clinical range (a raw score between 22 and 35) are likely to occur within a non-clinical female sample; between 55 and 93% produced raw scores within this range. This possibly reflects commonly held beliefs concerning weight, shape and attractiveness for women within a Western culture (Garner 2004). Therefore it was expected that a proportion of the female control group would have EDI-RF scores within the lower or typical clinical ranges, particularly as they were likely to fall within a younger age range (i.e. university undergraduates).

### *3.4.3 Measure of Avoidance: Acceptance & Action Questionnaire (AAQ; Hayes et al, 2004a)*

The AAQ (Hayes et al., 2004a) was used as the measure of experiential avoidance (Appendix M). The psychometric properties of this scale, including the presence of a single overarching factor structure that co-varies with concurrent indicators of anxious arousal and distress, have been established in clinical and non-clinical samples (Feldner, Zvolensky, Eifert & Spira 2003; Hayes et al., 2004a; Hayes, Luoma, Bond, Masuda, & Lillis 2006; Karekla, Forsyth & Kelly 2004). However, the AAQ is a relatively new measure and is currently undergoing validation. The AAQ has

demonstrated moderate correlations with general psychopathology checklists (Hayes et al. 2004a). It has reasonable internal consistency; Cronbach's  $\alpha$  of .70 and on comparison with the White Bear Suppression Inventory (a measure of avoidant coping; Wegner 1994) showed convergent validity of  $r=0.44-0.50$ .

For the purposes of this study, the 16-item factor solution was used as this is currently recommended for use in research (Hayes, 2005). Respondents rate the degree to which each statement applies to them on a Likert-type scale ranging from 1 (never true) to 7 (always true) with half of the items reverse scored. The possible range of scores on the AAQ is 16 to 112, and the AAQ can be scored in either direction. For the purposes of this study, as is recommended for clinical groups, higher scores indicate greater experiential avoidance (Hayes et al. 2004a). Due to the ongoing validation of the scale information regarding norms and interpretation is limited (Hayes et al, 2004a).

The AAQ was used in this study to measure experiential avoidance in participants with eating disorders in comparison to controls and to investigate if greater degrees of experiential avoidance were related to other forms of thought control strategy in a clinical ED population. It was also used to explore the relationship between experiential avoidance, attentional bias and cognitive avoidance.

#### *3.4.4 Thought Control Questionnaire (TCQ; Wells & Davies, 1994)*

The TCQ is a well utilised and researched measure of thought control strategies believed to have a link to psychopathology, which may be employed to manage unwanted and intrusive, distressing thoughts (Appendix K). The TCQ is a 30-item self-report measure designed to assess five thought control strategies; Distraction, Punishment, Re-appraisal, Social Control and Worry. The subscales have been shown to have moderate to strong internal consistency (Cronbach  $\alpha$  of .64 - .79 for the subscales) and have good test re-test reliability ( $r=.68-.83$ ; Wells 1994). It has been indicated that a tendency to use worry and punishment to control unwanted thoughts has important associations with emotional disorder and psychological disturbance (Wells 2000).

The TCQ was used in this study to explore the thought control strategies of relevance to an ED population and to compare this to a control group.

#### *3.4.5 Anxious Thoughts Inventory (AnTI; Wells, 1994):*

The AnTI has been widely used in clinical research and is a measure of the content of anxious thoughts (Appendix L). It comprises 22 items which can be summed to give a total score which comprises 3 subscales; Social worry, Health worry and Meta-worry. The subscales have good internal consistency (Cronbach  $\alpha$  of 0.84, 0.81 and 0.75 respectively). This measure is particularly useful in assessing the content of pathological worry and difficulties in the regulation of thought. The meta-worry scale assesses dysfunctional beliefs about cognition, and excesses in the self-regulation of thought.

The AnTI was used in this study to assess the specific content of worry in an ED population, in comparison to a control sample.

### 3.5 Experimental Paradigms

#### *3.5.1 Apparatus*

The experimental paradigms comprised three laptop based tasks, designed specifically for this study, as outlined below. Participants received the task instructions on the screen prior to beginning each task (Appendices N-P). These were also written out for them and displayed next to the computer. Briefly, they were instructed to work as quickly as possible, to try not to make any mistakes and that they would be timed for each task. Participants completed a short practise trial (4 neutral stimulus items) for each of the tasks described to minimise incorrect key hits and to familiarise themselves with the task and keyboard. Data for practice tasks were not included in the analyses. The stimuli related to the experimental paradigms were presented on a 15" Sony Vaio FX101. A software programme presented the stimuli and recorded responses and reaction times.

The computer programme comprising the modified Stroop task, distracter task and anagram solution task was piloted on a small group (n=4) of non-clinical volunteers to check for ease of use and the logistics of the software. The programme was also viewed and approved by the ED clinical team as suitable for use with their patients. As a result of this brief pilot work, a number of the anagrams were removed due to difficulty and the maximum anagram word length was set at 6 letters.

### *3.5.2 Modified Stroop task:*

The Stroop task consisted of three semantic categories of word stimuli; food and body stimulus words, and self-esteem threat words with corresponding neutral stimulus words (Appendix N and Table 2 below). The food and body words were selected from those reported in the existing literature (e.g. Channon, Hemsley & de Silva 1988; Davidson & Wright, 2002). The studies using ego-threat words were limited. Therefore word selection was based stimulus words used in a prior research study by McManus and colleagues (1996). The neutral stimulus words followed a similar format to prior research, forming three semantic categories; animals, household objects and neutral adjectives. Strategies were employed to match the disorder-salient words with the neutral stimulus for word length where possible (number of letters), initial letter and frequency of use in the English language, consistent with previous research. Stimulus words were presented in four colours (red, blue, yellow, green) that corresponded to coloured keys on the keyboard. The words were randomised across semantic categories, however the sequence of the words was fixed, i.e. 'threat' word – neutral word. The order of presentation of the Stroop stimuli was the same for all participants.

**Table 2: Examples of Stroop stimuli for the target and neutral categories**

<b>Food words</b>	<b>Body words</b>	<b>Self-esteem words</b>	<b>Neutral words</b>
dinner	figure	failure	rabbit
chips	hips	lonely	penny
chocolate	large	bad	draw

### *3.5.3 Distracter task*

The neutral cognitive task was based upon the digit span subtest of the Wechsler Adult Intelligence Scale-III (Wechsler, 1997) and involved correctly reproducing numbers presented on a screen. There were two parts to the test. Firstly, numbers appeared briefly (.25 – 1.25 seconds depending on the length of string of numbers) on screen in random order, participants were required to type them in the order that they appeared, increasing in difficulty up to a string of 6 numbers. Then participants were instructed to reproduce the numbers in the reverse order to that presented (Appendix O). This task was considered to be sufficiently cognitively demanding to counter the effects of cross-over between the Stroop and the anagram tasks.

### *3.5.4 Anagram solution task:*

Participants were asked to complete 32 anagrams consisting of words up to a maximum of 6 letters (see Appendix P and Table 3 below). Anagrams consisted of food, body, self-esteem threat and neutral words. There were 8 words in each category. Food and self-esteem threat words were based upon those previously reported in research (Meyer et al, 2005; Waller & Meyer, 1997). As body threat anagrams had not previously been used in the literature, body words were selected from those reported in modified Stroop research. The same matching criteria were employed for the neutral anagrams as in the modified Stroop task (see Section 2.5.2). The anagrams were randomised across the semantic categories and presented to the participants in the same order.

**Table 3: Examples of anagram stimuli for the target and neutral categories**

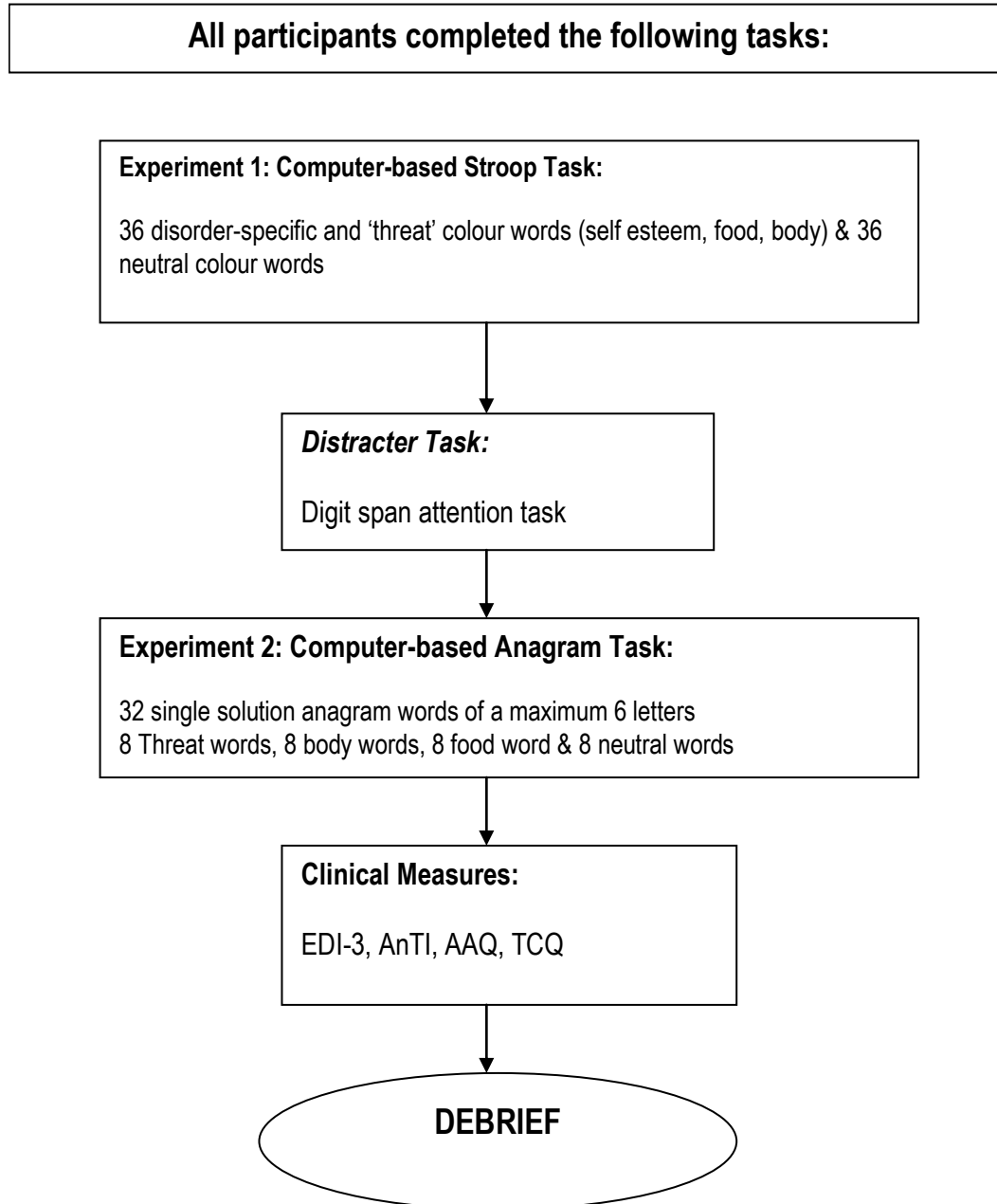
<b>Food words</b>	<b>Body words</b>	<b>Self-esteem words</b>	<b>Neutral words</b>
milk (kmil)	heavy (ahyev)	dumb (budm)	calf (lacf)
bread (abder)	body (dbyo)	empty (temyp)	hedge (ehegd)
cheese (esehce)	weight (etwigh)	ugly (gluy)	clip (licp)

### 3.6 Procedure

A flowchart detailing the procedure for the experimental tasks and assessment is shown in Figure 5 below. Following consenting to take part, participants completed the computer-based tasks and questionnaires in one session. This session lasted approximately an hour. All participants initially completed the background information questionnaire, for the clinical group this included the information about their current eating behaviour. Participants then completed the laptop-based Stroop test, followed by the neutral cognitive task and the anagram solution task. Following this, participants were asked to complete the questionnaires in the following order: EDI-3, AnTI, AAQ, and TCQ.

All assessment sessions were conducted at the clinical participant's home or at eating disorder clinic sites if more convenient. Assessment sessions for the control group took place at university premises, in experimental laboratories. The participants completed the experiment by working individually on a personal laptop computer. At the end of the assessment, all participants were fully debriefed as to the purpose of the study. They were asked if the assessment had made them think or worry about anything, and if they had any questions. Participants were given the option to receive feedback about their performance and a summary of the findings of the study if they wish this. They were then thanked for their time.

Figure 5: flowchart displaying the procedure for conducting the experimental tasks and questionnaire measures





### 3.7 Ethical Considerations

Ethical approval for the research was obtained from the Local Research Ethics Committee, the relevant Trust Research and Development group and the University Psychology Research Ethics Committee in September 2006 (see Appendices Q-S).

All participants were given an information sheet and asked to sign an accompanying consent form which informed them that their involvement was voluntary and that they had the option to choose to withdraw from the study at any time, without explanation. Clinical participants were informed that if they chose not to participate, or to withdraw, their care would not be affected. Participants in the clinical group were introduced to the study by a member of clinical staff already known to them. Confidentiality was assured at all times throughout the research process.

To ensure anonymisation, all participants were assigned a number prior to initial contact. This number was used on data sheets and the statistical database. This database complied with the Data Protection Act and was password protected. Participants names were recorded on a separate word document which was password protected. In order to calculate the response rate and ensure people were not approached more than once, the initials and date of birth of all people asked to participate in the study was recorded. All sheets of this nature were stored in a locked drawer.

With permission of the clinical participants, an information sheet was placed in their medical records and their GP was informed of their participation (see Appendix F). It was acknowledged that completing the questionnaires may have resulted in distress for some of the participants. Provision was made for all participants to have the opportunity to talk through any issues arising with the researcher. No participants reported distress at taking part. It was considered unlikely that the researcher would discover clinical issues which the participant's care team was not aware of. However, provision was made for the researcher to conduct a risk assessment if concerned about the safety of the participant for any reason. This was not necessary for any of the patients taking part in the study.

In the event of a control group participant experiencing distress, provision was made for the researcher to give the participant the opportunity to talk about their concerns, as well as providing information on accessing mental health services. As part of the university ethics protocol, all participants were given an information leaflet detailing the support systems available at the university.

To minimise the demand characteristics of the task, initial information given to participants about the study involved disguising the hypothesis. Therefore, participants were told the study was measuring perceptual abilities in people. Following the completion of the assessment session, participants were fully debriefed as to the actual aims of the study (see Appendix G). Participants were given the opportunity to receive individual feedback on their performance on the self-report questionnaires if they wished. Participants were offered the opportunity to receive a summary of the findings of the research if they wished to receive this.

## 4. Results

The results of the data analysis first cover a description of the sample and the preparatory analysis related to the experimental tasks. Then the results pertaining to the main research hypotheses concerning attentional bias and cognitive avoidance for food, body and self-esteem related threat words in eating disorders will be explored. This will be followed by further analyses in relation to experiential avoidance.

Statistical testing was performed at an alpha level of .05 throughout the results section, either 1 or 2 tailed depending on the hypotheses.

### 4.1 Sample description

Demographic data for the clinical ED and control group can be found in Table 4. T tests or chi square analyses were used to inspect the data for differences between the groups in terms of demographic features. As would be expected there was a significant difference in BMI between the two groups, with the control group having a significantly higher mean BMI of 21 (range 18.30 – 29.00) than the clinical group with a mean BMI of 17 (range 13.80 – 23.00). The BMI range for the control group was different from that stated in the inclusion criteria (BMI of 20-25). This perhaps reflected an initially conservative estimate of healthy weight for the control group, as none of the control group reported dieting or having eating difficulties. The difference in BMI from that of the inclusion criteria may also reflect the ethnic diversity of the control group. Although this was not formally recorded, participants recruited for the control group were more likely to be from a range of ethnic backgrounds. It is acknowledged that BMI can vary across racial and ethnic groups (Gallagher et al 1996; Nishida 2004).

There was a significant difference between the participants' ages, with the control group being younger (mean age 22; range 18-43) than the clinical ED group (mean age 28; range 19-53). Additionally, the group differed significantly in terms of their educational status with more

participants in the clinical group being already educated to degree level or above ( $\chi^2$  Fishers Exact Test (1, n=57) = 9.50, p=.01). However all participants in the control group were currently studying to obtain a degree.

The clinical and control groups did not differ significantly in terms of their first language being English ( $\chi^2$  Fishers Exact Test (1, n=57) =.46, NS), or in their marital status, with the majority of participants in both groups being single ( $\chi^2$  Fishers Exact Test (1, n=57) = 2.40, NS). It was therefore concluded that level of English and marital status would be unlikely to contribute to any differences found between the groups in subsequent analyses.

**Table 4: Frequencies, percentages (and SDs) and group statistics of demographic variables for the clinical ED and control group**

	<b>Clinical ED Group (N=23)</b>	<b>Control group (N=34)</b>	<b>p level</b>
<b>Mean age</b>	28.61 (8.60)	22.15 (4.74)	.001 <sup>a</sup>
<b>Mean BMI</b>	17.90 (2.74)	21.70 (2.44)	.001 <sup>a</sup>
<b>English as 1<sup>st</sup> Language</b>	21 (91.30%)	29 (85.30%)	NS
<b>Education –to degree level</b>	9 (39.10%)	2 (5.90%)	.01
<b>to A level</b>	14 (60.90%)	32 (94.10%)	
<b>Marital Status – single</b>	16 (69.60%)	29 (85.30%)	NS

<sup>a</sup>t-test; all other comparisons were chi square (Fisher's exact test)  
NS=no significant difference

## 4.2 Features of the ED clinical group

### *4.2.1 Eating Disorder Classification*

Eating disorder status was ascertained by using the diagnosis assigned by the service and also confirmed by the report of binge-purge (B/P) and restricting (R) behaviours in the adapted BITE. While this is not diagnostic, its purpose was merely to obtain a measure of B/P and R behaviours.

Of the 23 participants in the clinical group, 8 (34.8%) were classified as having Anorexia Nervosa Restricting type (AN-R), 8 (34.8%) as Anorexia Nervosa Binge-purge subtype (AN-B/P) and 7 (30.4%) as having Bulimia Nervosa (BN) or EDNOS with clinically significant binge eating.

The mean age of self-reported onset of ED pathology was 16 years (SD 3.6 years; age range 10-25), being 17 years of age for the AN-R group, 16 for the AN-B/P group and 14 for the BN/EDNOS group.

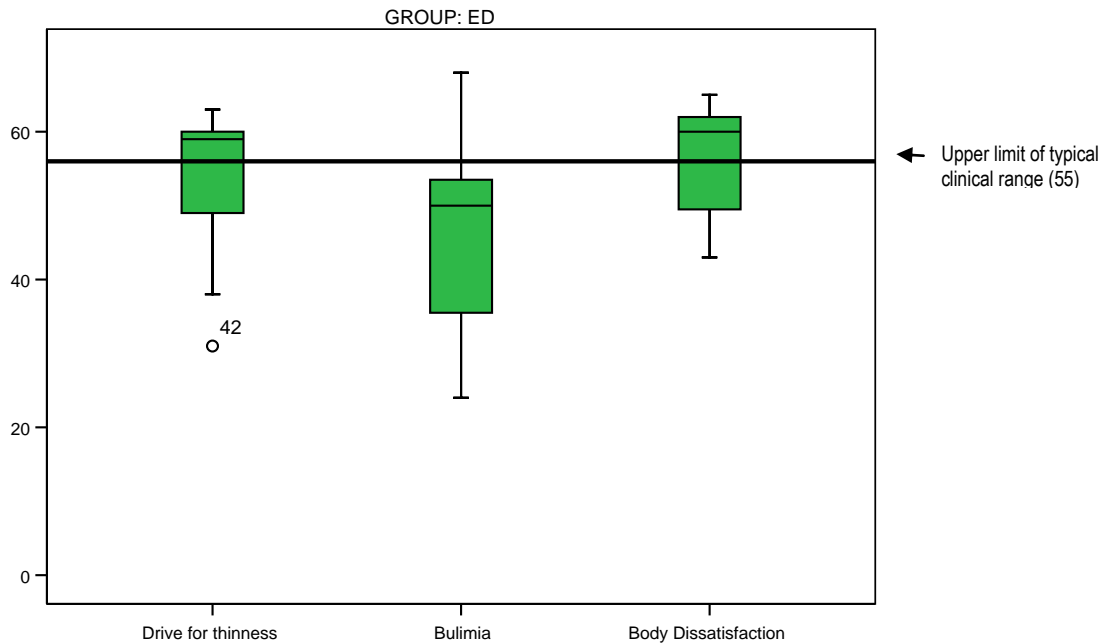
#### *4.2.2 Clinical Features of the ED group*

The mean time (in months) since referral to the service was 12 months (SD 7 months; range 3 -24 months). This data was not available for 7 participants. 13 (56.5%) of the clinical participants were on prescribed medication for their eating disorder and 7 (30.4%) ED participants were on no medication. Medication use was unavailable for 3 participants. A total of 8 (34.8%) participants had a recognised co-morbid psychiatric diagnosis, this occurred most commonly within the BN/EDNOS group (71.4% of this group had a co-morbid psychiatric diagnosis).

#### *4.2.3 Eating disorder psychopathology*

In order to further explore ED features among the clinical group, T scores on the primary subscales of the EDI-3 were examined. These relate to specific ED pathology, namely drive for thinness (DT), bulimic behaviours and cognitions (B) and degree of body dissatisfaction (BD). The distribution of the EDI-3 subscale scores are shown in the box plot (Figure 6). The horizontal line through each box represents the line of central tendency, the median score. The lower boundary of the box represents the 25<sup>th</sup> percentile, whilst the upper boundary represents the 75<sup>th</sup> percentile. The whiskers, the lines above and below the box indicate the largest and smallest scores. The Y axis line indicates the upper limit of the typical clinical range. Figure 6 illustrates that as would be expected, the clinical ED group reported high levels of drive for thinness, bulimic psychopathology and body dissatisfaction scores.

**Figure 6: Box plot displaying the mean T scores for the eating disorder pathology subscales of the EDI 3; DT, B and BD for the clinical ED group.**



Raw score means and standard deviations (SD) for the three eating disorder pathology subscales of the EDI 3 are presented in Table 5 for both groups. On the EDI-3 and RF questionnaire, the raw score range for DT is 0-28, with a DT raw score of 17 to 24 reflecting the typical clinical range. The raw score range for B is 0-32, with scores of 5 to 18 being the typical clinical range. For BD, raw scores range from 0-40 with a raw score of 22 to 35 representing the typical clinical range. As would be expected between clinical and non-clinical samples, there was a large discrepancy between the subscale scores between the groups. Non-parametric statistics for independent samples revealed that these differences were significant for DT ( $z=6.23$ ,  $p=.001$ ), B ( $z=4.90$ ,  $p=.001$ ) and BD ( $z=5.80$ ,  $p=.001$ ).

**Table 5: EDI 3 Eating pathology subscales descriptive statistics**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>ED (N=23)</b>	DT	24.00	11	28	5.60	-.95	-.16
	B	13.40	0	32	10.50	.58	-.99
	BD	33.60	19	40	7.70	-.93	-.76
<b>Control (N=34)</b>	DT	4.60	0	18	5.03	1.13	.42
	B	2.30	0	14	3.33	2.16	4.6
	BD	12.4	1	35	8.70	.71	.13

#### 4.2.4 Styles of coping with anxious thoughts (*Thought Control Questionnaire; TCQ*)

The descriptive statistics for the TCQ total score and the five subscales of Distraction, Social Control, Worry, Punishment and Re-appraisal are shown in Table 6. Higher scores on the TCQ reflect greater use of that particular strategy for controlling anxious thoughts. Higher scores on the strategies of Punishment and Worry have been found consistently in diagnostic and symptom groups (i.e. panic and major depression; Davey & Wells 2006). Typically non-clinical samples make more use of the strategies of Re-appraisal and Distraction, reflected in higher scores on these scales. Indications of case-ness are not currently available for this measure. Box plots and graphs of the distribution relating to the TCQ are shown in Appendix T. The two groups were then compared on these scales using non-parametric tests due to abnormalities in the distribution of the data.

**Table 6: Descriptive statistics for the TCQ subscales for the clinical and control groups**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Control (N=34)</b>	TCQ Total	63.85	30.00	87.00	11.00	-.34	2.00
	Distraction	16.70	11.00	24.00	3.40	.62	-.30
	Punishment	9.90	7.00	16.00	2.50	1.30	.71
	Re-appraisal	14.80	6.00	26.00	4.12	.46	.38
	Worry	9.80	6.00	20.00	3.04	1.40	2.62
	Social Control	13.85	6.00	23.00	4.70	-.04	-.22
<b>ED (N=23)</b>	TCQ Total	61.00	42.00	77.00	9.62	-.20	-.87
	Distraction	13.22	7.00	21.00	3.40	.94	1.35
	Punishment	13.52	8.00	20.00	4.03	.30	-1.24
	Re-appraisal	12.35	7.00	20.00	3.14	.40	.60
	Worry	13.00	9.00	19.00	3.10	.95	.001
	Social Control	9.22	6.00	19.00	4.22	1.25	.54

A Mann Whitney U test revealed significant differences between the clinical and control groups on each of the five subscales of Distraction, Punishment, Re-appraisal, Worry and Social Control (Table 7). There were large effect sizes between the groups for the majority of the subscales and a moderate effect size for the Worry subscale. These results indicated that the clinical group have higher scores on the control strategies found to be associated with psychopathology and problematic coping styles (i.e. Punishment and Worry).

For the more functional coping strategies of Reappraisal, Distraction and Social Control the results indicate that the control group showed greater use of these strategies. There was no significant difference between the two groups on the total TCQ score. This was to be expected as the total score amounts to a summation of potentially helpful and unhelpful thought control strategies.



**Table 7: Comparison of TCQ scores between groups**

Comparison	Mean (SE)	difference (SE)	Z	p value (2-tailed)	Effect size (Cohen's d)
1. ED Total TCQ score – Control Grp Total TCQ score	-2.90	(2.8)	-1.10	.30	-0.30
2. ED Distraction score – Control Grp Distraction score	-3.50	(.91)	-4.00	.001	-1.00
3. ED Punishment score - Control Punishment score	3.60	(.87)	3.60	.001	1.10
4. ED Re-appraisal score - Control Grp Re-appraisal score	-2.44	(1.01)	-2.30	.02	-.70
5. ED Worry score – Control Grp Worry score	3.20	(.83)	4.00	.001	0.50
6. ED Social Control score - Control Grp Social Control score	-4.63	(1.20)	-3.30	.001	-1.00

*\*negative effect sizes indicate higher scores on these subscales for the Control group*

#### 4.2.5 Nature of anxious thoughts (Anxious Thoughts Inventory; AnTI)

The descriptive statistics for the Anxious Thoughts Inventory (AnTI) total score, which measures the content and type of worry, and the three subscales of Social worry, Health worry and Meta-worry are displayed in Table 8. Box plots and graphs of the distribution relating to the AnTI are shown in Appendix T. The two groups were then compared on these AnTI subscales.

Higher scores on the AnTI reflect greater worry for each subscale. Typically clinical samples are found to have higher worry scores on all scales with mean clinical ranges for Social worry being around 24 to 25; approximately 14 to 15.5 for Health worry and 15.5 to 20 for Meta worry. Mean scores for non-clinical samples are around 18, 10 and 12.8 for these scales respectively (Wells 1994; Wells & Carter 2001).

**Table 8: Descriptive statistics for the AnTI subscales for the clinical and control groups**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Control (N=34)</b>	AnTI Total	40.50	24.00	75.00	11.30	.96	1.20
	Social worry	19.00	10.00	33.00	5.60	.60	-.12
	Health worry	9.20	6.00	19.00	3.40	1.80	3.20
	Meta worry	12.50	7.00	23.00	4.31	1.0	.33
<b>ED (N=23)</b>	AnTI Total	56.00	35.00	80.00	12.00	.01	-.18
	Social worry	26.00	19.00	36.00	5.30	.65	-.76
	Health worry	11.10	4.00	24.00	5.70	.95	-.04
	Meta worry	19.10	9.00	25.00	4.70	-.76	-.08

There were significant differences between the groups on total AnTI score, social worry and meta-worry with large effect sizes between the groups (Table 9). These results were in the direction that would be expected, with the clinical ED group obtaining higher scores for anxious thoughts. The difference between the two groups on the health worry subscale was not significant, although there was a tendency for the ED participants to produce higher scores on this subscale.

**Table 9: Comparison of AnTI scores between groups**

Comparison	Mean difference (SE)	Z	p value (1-tailed)	Effect size (Cohen's d)
1. ED Total AnTI score – Control Grp Total AnTI score	15.5 (3.1)	4.30	.001	1.30
2. ED Social Worry score - Control Grp Social Worry score	7.0 (1.5)	4.10	.001	1.80
3. ED Health Worry score - Control Health Worry score	1.9 (1.3)	.80	.40	0.40
4. ED Meta Worry score - Control Grp Meta Worry score	6.6 (1.2)	4.30	.001	1.50

#### 4.2.6 Experiential avoidance (Acceptance & Action Questionnaire; AAQ)

It was expected that the clinical group would have higher experiential avoidance scores than the control group, as measured by the Acceptance and Action Questionnaire (AAQ). Higher scores are indicative of greater experiential avoidance, with lower scores representing the tendency towards acceptance of negative private events and taking action to achieve personal goals. Because the AAQ is a relatively new measure, little has been published currently with respect to norms or how to interpret the scores. The descriptive statistics for the AAQ are reported in Table 10 (see Appendix T for box plots).

**Table 10: Descriptive statistics for the AAQ for the clinical and control groups**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Control (N=34)</b>	AAQ Total	51.20	37.00	74.00	9.40	.64	-.30
<b>ED (N=23)</b>	AAQ Total	67.10	40.00	83.00	12.00	-.53	-.24

The two groups were then compared on the AAQ score. Non-parametric tests for independent samples revealed significant differences between the groups on total AAQ score ( $z=4.4$ ,  $p=.001$ ), in the direction predicted with a large effect size (Cohen's  $d$ . 1.47).

### 4.3 Preparatory analysis in relation to the experimental tasks

As the computer programme used did not allow for control of errors and extreme response times on the modified Stroop or anagram tasks, it was necessary to censor invalid responses in both tasks by performing post hoc error analysis.

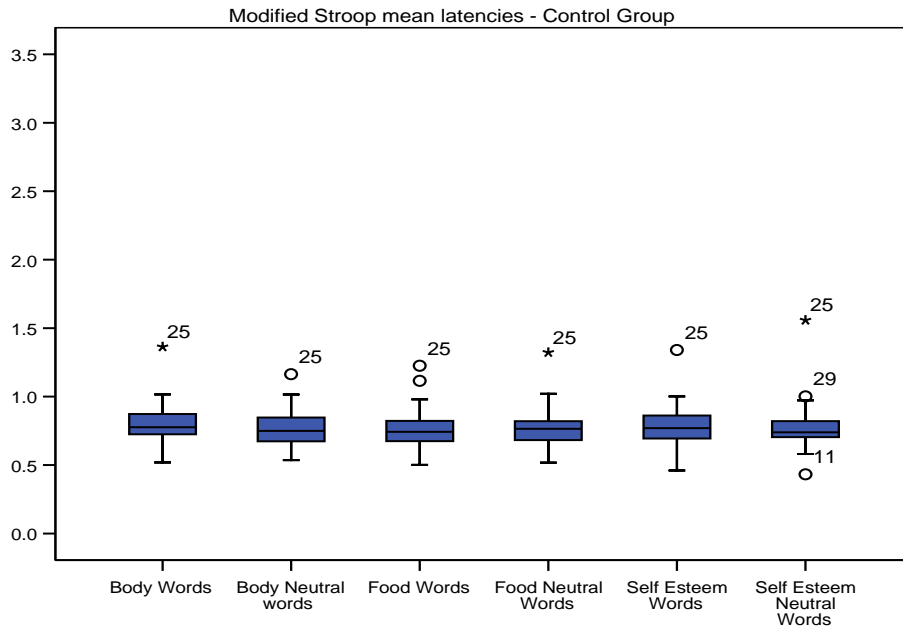
#### *4.3.1 Error Analysis for Stroop*

If a participant named the wrong colour by key stroke, miss hit a key, or made no response an error was recorded. The frequency of participants making one or more error responses on the Stroop task was 47.4% (see Appendix U). However, an exploration of the data indicated that no single Stroop item exceeded an error rate of 15% and that an error response on a Stroop item did not result in a significantly slower reaction time ( $t=1.45$ ,  $df = 53$ ,  $p = .15$ , NS). For this reason, there appeared to be no reason to exclude any single Stroop item on the basis of error in subsequent analyses. Additionally, there were no significant differences between the clinical (52.2%) and control groups (52.9%) in Stroop error ( $\chi^2$  Fishers Exact Test ( $df = 1$ ,  $n=57$ ) = .10, NS).

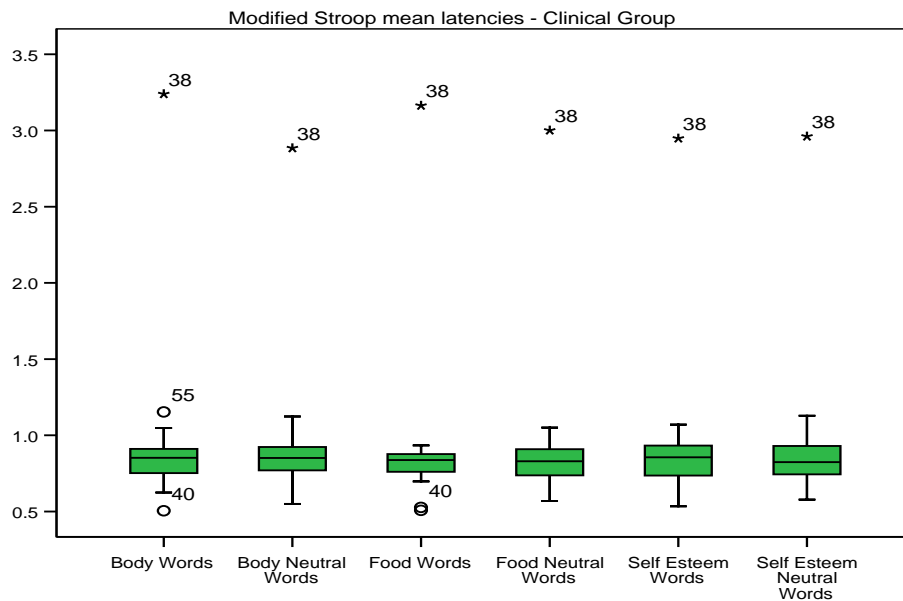
#### *4.3.2 Analysis of the distribution of latencies*

The reason for screening the Stroop data for error was to arrive at a reliable DV that would represent the mean for each individual across the trials. Box plots for the mean Stroop latencies for the clinical and control groups on food threat words, body threat words, self-esteem threat words and the corresponding neutral words for each category are shown in Figures 7 and 8. After inspection of the box plots the decision was taken to remove scores for one participant from each group (participant 25 from the control group and participant 38 from the clinical group).

**Figure 7: Box plot displaying the mean latencies (in seconds) for food, body, self-esteem threat words and the corresponding control words for the comparison group.**



**Figure 8: box plot displaying the mean latencies (in seconds) for food, body, self esteem threat words and the corresponding control words for the clinical ED group.**



In summary then, it can be concluded that the Stroop task did not prove too difficult as the error rate was acceptably low. It was not necessary to exclude any stimuli and finally, scores from just one participant from each group needed to be removed. For each participant the mean was concluded to be the best representation of performance on the Stroop task.

#### 4.3.3 Error Analysis for the anagram task

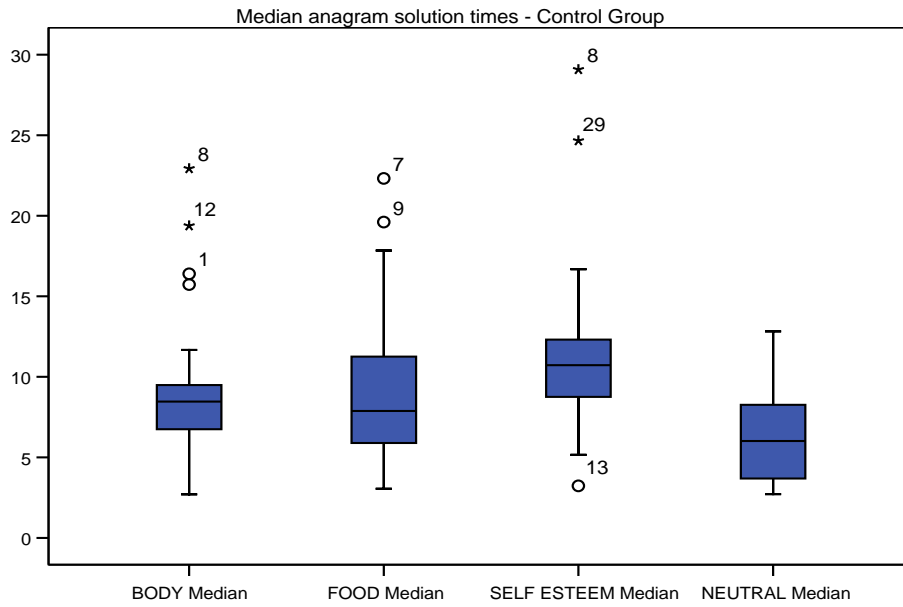
The rationale for this error analysis was to arrive at a reliable measure for this DV. If a participant produced a miss-spelt word, produced an incorrect word, made no response or produced one of the few alternative solutions to some of the anagrams, an error was recorded. One anagram produced a high degree of error in both groups (67.6% for controls and 52.4% for the clinical group) and was automatically excluded from the analysis (see Appendix V). There was a significant difference between the amount of error for the control group (5.9% made no error) and the clinical

ED group (34.8% made no error) on individual anagram items (Mann Whitney U test;  $z=3.51$ ,  $p = .001$ ). Due to the variation in the percentage of error per anagram between the groups, it was not appropriate to exclude any individual anagram on the basis of a percentage error rate. As it was unclear how to manage error within the anagram data based on previous research (Meyer et al 2005; Waller & Meyer 1997), all individual anagram errors were excluded case wise. Additionally any solution times in excess of 50 seconds or extreme values that fall 3 box-lengths from the 75<sup>th</sup> and 25<sup>th</sup> percentile were excluded (see box plots Appendix V).

#### *4.3.4 Analysis of the distribution of anagram solution times (in seconds)*

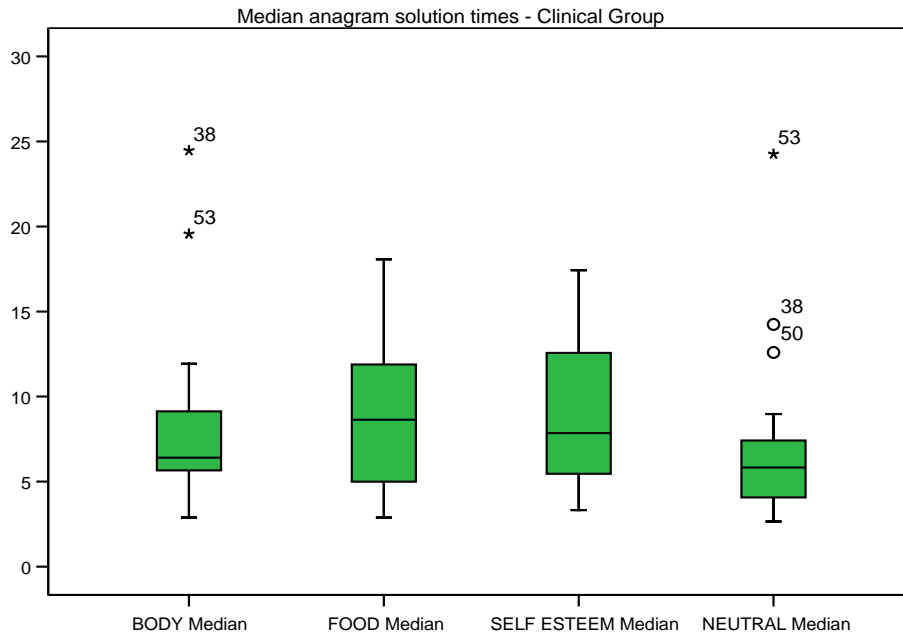
As a key dependent variable, the distribution of solution times for those anagrams correctly solved were inspected using box plots (Figures 9 and 10). Rather than using the mean, these box plots clearly indicated abnormalities in the distribution of the data and thus a more robust measure of central tendency, the median was decided upon to compute subsequent analyses for the anagram tasks. Non-parametric tests were used due to abnormalities in the distribution of the data. The box plots in Figures 9 and 10 indicate the median scores for each domain of word after all exclusions were performed as described above.

**Figure 9: Box plot displaying the median solution times (in seconds) for the control group for food, body, self-esteem threat and neutral anagrams**





**Figure 10: Box plot displaying the median solution times (in seconds) for the clinical ED on group for food, body, self esteem threat and neutral anagrams**



In summary then the anagram tasks produced a high degree of error, particularly so for the control group. Due to the differences in error between the groups, it was necessary to exclude anagram error and excess latencies on a casewise basis. For each participant the median was concluded to be the best representation of performance on the anagram task.

## 4.4 Experimental hypotheses related to the attentional bias paradigm: the modified Stroop task

### *4.4.1 Descriptive statistics for the modified Stroop task*

The descriptive statistics for the Stroop categories are presented in Table 11. Descriptives for the Stroop task are reported in tenths of a second. It was considered appropriate to use the mean statistic and parametric tests to analyse the Stroop data as there appeared to be few abnormalities in the data.

To answer the key experimental hypotheses relating to the modified Stroop paradigm, a series of planned comparisons within and between groups were conducted and tested 1-tailed. These are outlined below.

**Table 11: descriptive statistics for disorder-relevant and self-esteem threat words and the corresponding control words.**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Control (N=33)</b>	Body Word	.78	.52	1.02	.125	-.01	-.37
	Body neutral	.76	.54	1.02	.126	.20	-.67
	Food Word	.75	.50	1.12	.124	.71	1.20
	Food neutral	.75	.52	1.02	.110	.36	.25
	Self-esteem threat	.76	.46	1.00	.130	-.03	.02
	Self-esteem neutral	.75	.43	1.00	.115	-.02	1.30
<b>ED (N=22)</b>	Body word	.84	.50	1.15	.147	-.091	.61
	Body neutral	.83	.55	1.12	.136	-.095	.81
	Food word	.83	.51	1.23	.156	.366	2.10
	Food neutral	.80	.57	1.05	.116	-.116	.25
	Self-esteem threat	.82	.53	1.07	.139	-.458	-.23
	Self-esteem neutral	.83	.58	1.13	.141	.322	.38

*Mean latencies for Stroop word stimuli reported in tenths of a second.*

#### 4.4.2 Hypothesis 1:

Female participants with an eating disorder will have slower response times (indicating attentional bias) for naming the colour of three categories of threat word in relation to neutral words. In order to test this hypothesis three within groups planned comparisons were conducted to compare the domains of body words, food words and self-esteem threat words with the matched neutral words for each domain.

As can be seen from Table 12, a related samples t test did not reveal significant differences between clinical ED participants mean latencies on the paired neutral words and the body, food and self-esteem threat words. The corresponding effect sizes were very small. Therefore, the experimental hypothesis could not be accepted.

**Table 12: Results of planned within group comparisons for Hypothesis 1.**

Planned comparison	Mean difference (SE)	t (df)	p value (1-tailed)	Effect size (Cohen's d)
1. Body Mean – Body neutral Mean	.01 (.016)	.57 (53)	.29	.06
2. Food Mean – Food neutral Mean	.02 (.015)	1.57 (53)	.07	.17
3. Self-esteem threat Mean - Self-esteem neutral Mean	.01 (.018)	.75 (53)	.23	.09

#### 4.4.3 Hypothesis 2

It was hypothesised that participants in the clinical group would have slower response times for naming the colour of threat words than the control group. In order to test this hypothesis, three between groups planned comparisons were performed to compare the clinical group and the control group on response times for the body, food and self-esteem threat words.

As can be seen from Table 13, an independent samples t test revealed significant differences between clinical group and the control groups mean latencies on the food words and self-esteem threat words. The difference between the two groups on body words almost reached significance. The difference in mean latencies on each domain of disorder relevant or threat word occurred in the direction predicted. The corresponding effect sizes were all moderate hence the experimental hypothesis that the clinical ED group would have longer latencies on the disorder relevant and self-esteem threat stimuli was accepted.

**Table 13: Results of planned between groups comparisons for Hypothesis 2.**

Planned comparison	Mean difference (SE)	t (df)	p value (1-tailed)	Effect size (Cohen's d)
1. ED Grp Body Mean – Control Grp Body Mean	.06 (.04)	1.60 (53)	.06	.45
2. ED Grp Food Mean – Control Grp Food Mean	.07 (.04)	1.90 (53)	.03	.50
3. ED Grp Self-esteem threat Mean – Control Grp Self-esteem threat Mean	.06 (.04)	1.70 (53)	.05	.45

*Hypothesis 2a:*

It was predicted that there would be no difference between the groups for latencies on the neutral Stroop words. However, an independent samples t test revealed that this difference was significant, contrary to prediction ( $t=1.90$  (53),  $p=.03$ ). The effect size for this comparison was moderate (Cohen's  $d=.52$ ) indicating that the clinical group were generally slower to respond on the Stroop. This has an implication for Hypothesis 2 in that slower response times in the clinical group may not be related solely to threat stimuli.

4.5 Experimental hypotheses related to the cognitive avoidance paradigm: the anagram solution task

*4.5.1 Descriptive statistics for the anagram solution task*

The descriptive statistics for the anagram task categories are presented in Table 14. Descriptives for the anagram solution times are reported in seconds. Due to abnormalities, in particular skewness and kurtosis, non-parametric tests were used to analyse the anagram data.

**Table 14: descriptive statistics for disorder relevant, self-esteem threat and neutral anagrams.**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Control</b>	Body anagram (N=33)	9.30	2.70	22.90	4.90	1.50	2.20
	Food anagram (N=33)	9.80	3.00	27.10	5.90	1.30	1.30
	Self-esteem threat anagram (N=32)	11.60	3.20	29.00	5.00	1.80	4.60
	Neutral anagram (N=34)	6.50	2.70	19.70	3.40	1.90	5.90
<b>ED</b>	Body anagram (N=23)	8.30	2.90	24.50	5.10	1.90	4.30
	Food anagram (N=22)	8.80	2.90	18.10	4.20	.50	-.66
	Self-esteem threat anagram (N=22)	8.90	3.30	17.40	4.30	.70	-.70
	Neutral anagram (N=23)	7.40	2.60	24.30	5.10	2.00	4.55

*Anagram solution times are reported in seconds.*

To answer the key experimental hypotheses relating to the anagram solution task, a series of planned comparisons within and between groups were conducted and planned to be tested 1-tailed. These are outlined below.

#### 4.5.2 Hypothesis 3:

It was hypothesised that female participants with an eating disorder would demonstrate slower performance times for solving anagrams (indicating cognitive avoidance) of food, body and self-esteem threat words in relation to neutral words.

In order to test this hypothesis three within-subjects planned comparisons were conducted to compare the domains of body, food and self-esteem threat anagrams with a set of matched neutral anagrams. The means and standard deviations for each anagram domain for the clinical and control group are illustrated in Table 14.

As can be seen from Table 15, a Mann Whitney U test revealed significant differences between clinical participants mean anagram solution times on the neutral anagrams, food anagrams and self-esteem threat anagrams. There were no statistically significant differences for solution times between body anagrams and neutral anagrams. Therefore, the experimental hypothesis can only be partially accepted because the effect size for the first comparison was very small. It was concluded that eating disorder participants produce longer latencies for food and self-esteem threat anagrams in comparison to neutral anagrams.

However, from surveying the mean solution times (Table 14), it appeared the control group produced longer solution times than the clinical group which had the potential to obscure the findings. This was further explored in a post hoc investigation in Section 4.8.

**Table 15: Results of planned within group comparisons for Hypothesis 3.**

<b>Planned comparison</b>	<b>Mean difference (SE)</b>	<b>Z</b>	<b>p value (1-tailed)</b>	<b>Effect size (Cohen's d)</b>
1. Body anagram – Neutral anagram	.86 (.70)	1.20	.10	.16
2. Food anagram – Neutral anagram	2.00 (.80)	2.20	.01	.40
3. Self-esteem threat anagram - Neutral anagram	1.90 (.70)	2.70	.01	.40

#### *4.5.3 Hypothesis 4:*

Female participants with an eating disorder will demonstrate slower response times for solving body, food and self-esteem threat anagrams (indicating cognitive avoidance) than a control group. In order to test this hypothesis, three between subjects planned comparisons were performed to compare the clinical group and the control group on anagram solution times for the body, food and self-esteem threat anagrams. To further investigate if the control group were significantly different from the clinical group the Mann Whitney U tests were performed 2 tailed.

As can be seen from Table 16, the Mann Whitney U test did not reveal significant differences between the clinical ED group and the control group anagram solution times for the body anagrams or food anagrams. The significant finding for the self-esteem threat anagrams was likely to be a result of a significantly slower response time for the control group (see Table 14). For this reason the experimental hypothesis that the clinical ED group would demonstrate slower response times for solving threat anagrams than the control group was rejected.



**Table 16: Results of planned comparisons between groups for Hypothesis 4.**

Planned comparison	Mean difference (SE)	Z	p value (2-tailed)	Effect size (Cohen's d)
1. ED Grp Body Median – Control Grp Body Median	-1.01 (1.40)	-1.10	.30	-.21*
2. ED Grp Food Median – Control Grp Food Median	-.62 (1.50)	-.30	.80	-.11
3. ED Grp Self-esteem threat Median – Control Grp Self- esteem threat Median	-2.42 (1.30)	-2.20	.03	-.50*

*\*a negative effect size indicates that the control group were slower to process these anagrams*

*Hypothesis 4a:*

It was predicted that there would be no difference between the groups on anagram solution time for the neutral words. A Mann Whitney U tests for independent samples revealed this to be the case ( $z=.15, p=.90$ ).

The indication that the mean anagram solution times for the disorder-relevant and self-esteem threat appeared to be longer for the control group (Table 14) will be further explored in post hoc analysis in Section 4.8 where an attempt will be made to probe into the negative results.

## 4.6 Experimental hypotheses relating to eating-disordered behaviour

### 4.6.1 Hypotheses 5a:

It was proposed that ED diagnostic behaviours (i.e. binge-purge (B/P) behaviour or restricting (R) behaviour) may have a moderating effect on the Stroop latencies for particular categories of word (i.e. food, body and self-esteem threat words). The clinical ED group was split along these lines with 15 participants in the B/P group and 8 in the R group. Due to the small sample sizes, the means were initially explored, indicating that the B/P group had longer latencies on the target Stroop words (see Table 17).

**Table 17: Descriptive statistics for the disorder-relevant and self-esteem Stroop categories, split by eating-disordered behaviour**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Binge-purge (N=15)</b>	Body words	.86	.65	1.15	.13	.61	.53
	Food words	.87	.70	1.23	.14	1.50	2.40
	Self-esteem threat words	.84	.64	1.07	.12	-.110	-.42
<b>Restricting (N=7)</b>	Body words	.80	.50	1.05	.18	-.41	.10
	Food words	.74	.51	.88	.16	-.90	-1.20
	Self-esteem threat words	.77	.53	.97	.17	-.50	-1.10

A Mann Whitney U test was then performed on the data for the two groups (2-tailed). The difference between the groups was not significant for body, food or self-esteem threat anagrams (Table 18). However the effects sizes for these comparisons were moderate for the body and self-esteem threat anagrams and large for the food anagrams. This indicates a strong trend for those with B/P behaviours to show longer latencies for these categories, indicating greater attentional bias.

**Table 18: Planned comparisons for Hypothesis 5b between the binge-purge and restricting groups on anagram words**

Planned comparison	Z	p value (2-tailed)	Effect size (Cohen's d)
1. B/P Grp Body Mean – R Grp Body Mean	.74	.40	.40
2. B/P Grp Food Mean – R Grp Food Mean	1.00	.30	.90
3. ED Grp SE threat Mean – R Grp Self-esteem threat Mean	.10	.30	.50

*4.6.2 Hypotheses 5b:*

It was further hypothesised that ED behaviour (i.e. B/P or R behaviour) may have a moderating effect on anagram solution time for particular words (i.e. food, body and self-esteem threats). As the sample sizes were small, potential differences were explored descriptively in Table 19.

**Table 19: Descriptive statistics for the disorder-relevant and self esteem threat anagrams for the ED group, split by eating-disordered behaviour**

Group		Mean	Minimum	Maximum	SD	Skewness	Kurtosis
<b>Binge-purge (N=15)</b>	Body anagram	8.15	2.90	24.47	5.12	2.50	7.80
	Food anagram	9.06	2.90	14.81	3.90	-.05	-1.50
	Self-esteem anagram	8.47	3.32	16.92	3.91	.80	.10
<b>Restricting (N=7)</b>	Body anagram	8.50	3.36	19.56	5.40	1.40	1.70
	Food anagram	8.26	3.90	18.07	5.00	1.40	2.10
	Self-esteem anagram	9.86	4.34	17.43	5.17	.40	-1.90

A Mann Whitney U test was performed on the data for the two groups (see Table 20). The difference between the groups was not significant for body, food or self-esteem threat anagram solution time. The effect sizes were small and so the hypothesis that type of eating-disordered behaviour would have a moderating effect of anagram solution time was rejected.

**Table 20: Planned comparisons for Hypothesis 5b between the Binge-Purge and Restricting Groups on anagram words**

Planned comparison	Z	p value (2-tailed)	Effect size (Cohen's d)
1. B/P Grp Body Median – R Grp Body Median	-.13	.90	-.06*
2. B/P Grp Food Median – R Grp Food Median	.81	.40	.17
3. B/P Grp SE threat Median – R Grp SE threat Median	-.53	.60	-.36*

*\*negative effect sizes indicate that the restricting group were slower to process these anagrams*

#### 4.7 Correlational analyses of the AAQ

##### 4.7.1 Hypothesis 6a:

It was predicted that there would be positive correlations between the AAQ and selected key subscales of the questionnaires for the clinical ED group; AnTI Total, AnTI Meta Worry, AnTI Social Worry, TCQ Worry, TCQ Punishment, TCQ Distraction and the 3 eating disorder composite scores of the EDI 3; DT, BN and BD. It was further predicted that these relationships would be present for the control group in relation to the AAQ and the subscales depicting content of worry and problematic efforts at coping with worry; AnTI Total, AnTI Meta Worry, AnTI Social Worry, TCQ Worry, TCQ Punishment and Distraction. However the correlations were expected to be stronger in the ED group and for this reason the results for each group are presented separately.

Non-parametric correlational analyses (Spearman's *rho*; 1-tailed) were conducted between the AAQ score with the selected key variables. Table 21 shows which of these subscales correlated significantly with the AAQ total score for each group. For the clinical group, AAQ scores on the TCQ Worry and the EDI 3 Drive for Thinness (DT) scale were not significant, against the hypothesis. For the control group, the AAQ correlated with all key scales apart from Distraction and Bulimia (BN) on the EDI 3. This indicates a relationship between level of experiential avoidance, anxious thoughts and pathological coping strategies in the control group.

**Table 21: Correlational analyses for the AAQ with selected key questionnaire variables for the clinical ED and control group**

	Clinical ED Group (N=23)		Control Group (N=34)	
	Spearman's rho Correlation	p value	Spearman's rho Correlation	p value
<b>AAQ with Anti Total</b>	.50	.01	.54	.001
<b>AAQ with Meta Worry (AnTI)</b>	.40	.03	.70	.001
<b>AAQ with Social Worry (AnTI)</b>	.41	.02	.45	.004
<b>AAQ with Worry (TCQ)</b>	.23	.15 NS	.55	.001
<b>AAQ with Punishment (TCQ)</b>	.37	.04	.45	.003
<b>AAQ with Distraction (TCQ)</b>	-.41	.02	-.11	.2 NS
<b>AAQ with DT (EDI 3)</b>	.30	.08 NS	.31	.03
<b>AAQ with BN (EDI 3)</b>	.60	.002	.08	.32 NS
<b>AAQ with BD (EDI 3)</b>	.38	.03	.43	.005

4.7.2 Hypothesis 6b:

In terms of correlational analysis a relationship was also expected between the measure of experiential avoidance (AAQ) and the Stroop and anagram tasks. However, contrary to prediction no significant relationships were found between the AAQ and either of the experimental tasks (see Tables 22 and 23).

**Table 22: Correlational analyses for the AAQ with the target Stroop words**

	Clinical ED Group (N=22)		Control Group (N=33)	
	Spearman's rho Correlation	p value	Spearman's rho Correlation	p value
<b>AAQ with Stroop Body Mean</b>	.05	.82	.06	.75
<b>AAQ with Stroop Food Mean</b>	.18	.42	.05	.76
<b>AAQ with Stroop Self-esteem Threat Mean</b>	.07	.75	.04	.837

**Table 23: Correlational analyses for the AAQ with the target Anagram words**

	Clinical ED Group (N=22)		Control Group (N=33)	
	Spearman's rho Correlation	p value	Spearman's rho Correlation	p value
<b>AAQ with Body Anagram Median</b>	.24	.30	.10	.60
<b>AAQ with Food Anagram Median</b>	.05	.80	.23	.20
<b>AAQ with Self-esteem Anagram Median</b>	.27	.23	.05	.80

#### 4.8 Post hoc analysis relating to the control group

During testing of the planned comparisons for Hypotheses 3 and 4, it emerged that the mean anagram solution times for the disorder-relevant and self-esteem threat seemed to be longer for the control group (Table 14). As this was in the opposite direction to that predicted it was considered necessary to explore this further. Within-subjects post hoc comparisons indicated that participants in the control group produced significantly longer anagram solution times for food words ( $z=3.50$ ,  $p=.001$ ), body words ( $z=3.48$ ,  $p=.001$ ) and self-esteem threat anagrams ( $z=4.64$ ,  $p=.001$ ) than neutral anagrams. These effects are much greater than for the clinical group (Cohen's  $d$  of .72, .70 and 1.22 respectively).

Between groups comparisons conducted for Hypothesis 4 (Table 16) indicated a negative effect in that the control group produced longer anagram solution times for self-esteem threat words than clinical ED group. Investigations into the amount of error produced by both groups on the anagram solution task indicated that the control group produced significantly more errors than the clinical ED group (see Section 3.3.3 and Appendix V). In combination, these findings limit the conclusions that can be drawn for the clinical group as the findings suggest that the effect of cognitive avoidance is more apparent for the control group without an eating disorder. The possible explanations and accounts for this negative finding will be discussed within the next Section.

## 5. Discussion

The main aims of this study were twofold. Firstly, to investigate whether female participants with an eating disorder would demonstrate attentional bias to the disorder relevant information of food, body stimuli and self-esteem threat stimuli in comparison to neutral stimuli and in contrast to a control group. Secondly, to investigate whether cognitive avoidance of the above stimuli exists in female eating disorder participants in comparison to neutral stimuli and a control group. Additional hypotheses related to the presence of experiential avoidance and the relationship between this and cognitive ways of coping was explored in both groups.

This section will present and discuss the following main areas in relation to these aims;

- an overview of the main findings in relation to the experimental hypotheses.
- a review of the main findings in relation to previous research on attentional bias and cognitive avoidance in eating disorders.
- a discussion of the strengths and limitations of the present study in the context of the existing research.
- a consideration of the theoretical and clinical implications of the findings in the context of the present study and existing literature.
- an overview of the general limitations of the present study and suggestions for improvements.
- a discussion of ideas generated for future research.

### 5.1 Overview of results

#### *5.1.1 Characteristics of the sample:*

It appeared that the two groups did differ in terms of eating disorder pathology, as would be expected. The clinical ED group of participants had a significantly lower mean BMI than the control



group and obtained significantly higher scores on the EDI 3 key eating disorder subscales. The means for these subscales amongst the control group were comparable with non-clinical samples in previous research (Garner 2004; Waller & Meyer 1997). However, some of the scores on the BD and DT scales were elevated in some control subjects suggestive of negative body image for some participants in this group.

The groups were significantly different in terms of age, with the control group being younger than the clinical group. This perhaps should have been anticipated given that the control group were predominantly drawn from an undergraduate university sample and the clinical group from a community sample. The groups were also significantly different in terms of educational level with more participants in the clinical group having a level of education to degree status or above. However, all control group participants were studying for a degree at the time of taking part in the experiment which may over-ride this finding. These findings were important in relation to the experimental hypotheses as they meant that it was not possible to rule out performance on the tasks being down to age or level of education. This will be discussed further in due course.

On the clinical scales related to anxiety, as expected the clinical group demonstrated significantly greater degrees of worry than the control group and reported strategies for coping with worry which were more associated with psychopathology (e.g. coping strategies of punishment and ruminative worry). The control group demonstrated significantly higher reports of adaptive coping strategies, such as distraction and the re-appraisal of anxious thoughts. The clinical group reported greater levels of experiential avoidance, which was a highly significant large effect.

#### *5.1.2 Experimental hypotheses relating to attentional bias*

The key findings in relation to the Stroop task are outlined in Table 24 below. Preparatory analysis had indicated acceptable rates of error for the Stroop items and therefore no Stroop item was excluded on the basis of error in the analyses. However, extreme cases in terms of latencies were removed from the analysis.

**Table 24: Key findings for hypotheses relating to attentional bias**

<b>Hypothesis</b>		<b>Result</b>
<i>Hypothesis 1 (within group)</i>	The clinical group will have slower response times for naming food, body and negative self-esteem threats in relation to neutral words.	No significant difference. Effect sizes small. Hypothesis rejected.
<i>Hypothesis 2 &amp; 2a (between group)</i>	The clinical group will have slower response times for naming the colour of threat word than the control group.  There will be no significant difference between the groups on neutral words.	Significant difference for food & self-esteem. Moderate effect sizes for these comparisons. However clinical group slower on neutral words. Hypothesis 2 not corroborated.
<i>Hypothesis 5a (between ED behaviour)</i>	ED binge-purge (B/P) behaviour or restricting (R) behaviour will have a moderating effect on the Stroop latencies for food, body and self-esteem threat words.	No significant effect. Moderate – large effect sizes, indicating some support for the hypothesis.

### 5.1.3 Experimental hypotheses relating to cognitive avoidance

The key findings in relation to the anagram task are shown in Table 25. Preparatory analysis for the anagram solution task had indicated some problems in the data in terms of error. Higher error rates appear to have been generated exclusively by controls. Individual anagram errors were case wise excluded from the analysis, together with excessive anagram solution times. The rate of error is a concern in terms of the potential impact on the results for the hypotheses relating to cognitive avoidance. This will be discussed in the context of the study limitations below.

**Table 25: Key findings for the hypotheses relating to cognitive avoidance**

Hypothesis		Result
Hypothesis 3 <i>(within group)</i>	The clinical group will have slower performance times for solving food, body & self-esteem threat anagrams in relation to neutral anagrams.	Significant difference; neutral & food & self-esteem anagrams. No significant differences for body-neutral anagrams. Moderate effect sizes. Partial support for hypothesis.
Hypothesis 4 & 4a <i>(between group)</i>	The clinical group will have slower response times for body, food & self-esteem threat anagrams than the control group.  There will be no significant difference between solution times for neutral anagrams.	No significant differences in direction predicted. Moderate effect sizes indicated control group were slower on body & self-esteem anagrams. Hypothesis rejected.
Hypothesis 5b <i>(between ED behaviour group)</i>	ED behaviour (B/P or R) will have a moderating effect on anagram solution time for food, body and self-esteem threats.	No significant differences. Small effect size. Hypothesis rejected.

*5.1.4 Summary of correlational analysis related to experiential avoidance*

Experiential avoidance was found to be related to greater degrees of anxious thoughts, with pathological cognitive coping strategies for managing anxious thoughts (e.g. Punishment) and with some features of eating disorder pathology (e.g. Body Dissatisfaction). There was evidence of a relationship between experiential avoidance and these features in both the control and clinical groups. Unexpectedly, no relationships were found between experiential avoidance and the tasks relating to attentional bias or cognitive avoidance.

## 5.2 Interpretation of findings

The theoretical and research literature reviewed in the introduction highlighted the importance of the shared features and maintaining mechanisms considered to be common to eating disorders (Fairburn & Harrison 2003; Fairburn et al 2003). A transtheoretical approach (Figure 2) was proposed drawing on theories that encompassed the cognitive processes considered to be important in the development and maintenance of eating disorders, which were not adequately considered in existing disorder-specific CBT models. Attentional bias and cognitive avoidance were two such processes and were selected for further investigation within this study. The findings from this study relating to the processes of attentional bias and cognitive avoidance will now be discussed with reference to the existing literature.

### *5.2.1 Interpretation of findings related to attentional bias in the context of previous research*

The experimental literature appeared to consistently demonstrate the existence of attentional biases to stimuli in line with the current concerns (Klinger 1996) of individuals with eating disorders; for example food, weight and body shape information (Cooper et al 1992; Cooper & Fairburn 1993; Davidson & Wright 2002; Dobson & Dozois 2004; Fairburn et al 1991; Prato & John 1991; Rofey et al 2004; Shafran et al 2007; Waller et al 1995). The Stroop paradigm in the present study did not produce results in line with this. There was evidence that the clinical group were generally slower to process information that was not specifically related to threat (i.e. also neutral words). This combined with the lack of a significant difference within the clinical group between threat and neutral stimuli, suggests a lack of support for attentional bias to threat in this study.

By exploring the literature in more detail it is possible to place these findings in context. It is the case that attentional biases have been demonstrated in ED, however this has not been consistently so across stimuli type or ED diagnosis. Inconsistencies in studies have shown that the nature of stimuli employed has not always been found to reliably relate to ED samples (Dobson & Dozois 1994). For example, failures to detect attentional biases for body shape and weight words have been reported for participants with AN (Ben-Tovim et al 1989; Fassino et al 2002; Perpina et al

1993) and for those with BN (Black, Wilson, Labouvie & Heffernan 1997). Biases towards food words have also been found inconsistently (Faunce 2002; Lee & Shafran 2004), with variability between ED diagnoses. For example the Stroop effect for food words has been found to be more apparent in AN and less so in BN (Ben-Tovim & Walker 1991; Cooper & Todd 1997; Channon, Hemsley & de Silva 1988; Perpina et al 1993). Research exploring attentional biases for self-referent information beyond that of food, weight and shape is limited yet seems to indicate that biases for this type of information are present, at least for individuals with BN psychopathology (McManus et al 1996; Meyer et al 2000; Waller et al 1996). However, this study would seem to support those mentioned above that query attentional bias in ED using the Stroop paradigm.

The failure to find an effect between target and neutral stimuli in this and some prior studies quoted may refer to the efficacy of the emotional Stroop paradigm as a tool for measuring attentional bias. Some research has suggested that there are theoretical difficulties relating to the ability of the emotional Stroop to differentiate between attentional bias (i.e. diverting attention towards a stimulus) and cognitive avoidance of a stimulus (Lavy & van den Hout 1994; Mogg & Bradley 1999; de Ruiter & Broschot 1994). More recent research has employed different paradigms, such as the dot probe task, which propose to be more effective at measuring attentional bias than the Stroop task (e.g. Shafran et al 2007; Wells & Matthews 1994). However the criticisms levelled at the Stroop can also be applied to these newer paradigms (Fox, Russo, & Dutton 2002; MacLeod, Mathews, & Tata, 1986). Studies using paradigms that differentiate these factors have been used in anxiety disorders (Amir, Elias, Klumpp & Przeworski 2003) and depression (Koster, De Raedt, Goeleven, Franck & Crombez 2005). However these paradigms are developing and have yet to be used with ED populations to date (Shafran et al 2007). Within this study, it was felt important to use a well established measure of attentional bias (Wells, Mathews & MacLeod 1996) to balance the use of the relatively novel measure of cognitive avoidance.

### *5.2.2 Strengths and limitations of the present study in relation to the attentional bias paradigm*

There were many strengths within this study in relation to the Stroop paradigm which mainly involved revising the task to rule out a number of confounders. Attempts were made to improve the

stimuli used by matching the number of target stimuli semantic categories with an equal number of categories for neutral stimuli and avoiding types of stimuli known to impact on latencies (i.e. avoiding colour stimuli). The presentation and recording of the Stroop stimuli was improved by using computerised presentation and recording of response times to minimise the effect of the experimenter and improve accuracy. Stimuli was randomised in terms of content of semantic category and the order fixed (i.e. all were presented threat-control). This was to prevent the possibility of an effect of sequence that would occur if the stimuli were generated completely at random. In order to make the study applicable to prior research, Stroop stimulus words were chosen from those words previously used wherever possible.

However the lack of statistically significant findings for the Stroop may be related to some weaknesses in terms of the stimuli chosen. Using stimuli from prior research may have meant that that the disorder relevant categories were perhaps not adequately delineated (Faunce 2004; Lee & Shafran 2004). For example, the food category consisted of generic food words (i.e. 'dinner') with high calorie words (i.e. 'cookie') and within the body category words relating to both shape (e.g. 'thighs') and weight (e.g. 'heavy') were used (see Appendix N). This may be problematic as it does not allow biases for these potentially different stimuli to be revealed, and one type of stimuli may have obscured the effects of the other. However, having twelve stimuli in each category should have allowed for this to be adequately controlled for.

The lack of a significant effect for the clinical group in terms of the disorder relevant and self-esteem categories with the neutral words may be due to the selection of appropriate neutral word stimuli. Prior research lacks specificity in terms of how neutral stimuli are selected and decided upon (Lee & Shafran 2002). Attempts were made to match the format of existing research while being mindful of the suggestions for improvements in terms of using stimuli that occur with similar frequency (e.g. using animal and household objects). It would seem that these attempts were successful as preliminary analysis (see Appendix U) indicated correlations between all categories of words. This suggested that the Stroop words were well matched in terms of difficulty between the categories and participants were generally consistent in their responses.

It may be that words in themselves are somewhat inadequate to consistently detect differences in attention. Some research has employed pictorial versions of attentional bias tasks (Shafran et al 2007; Walker, Ben-Tovim, Paddick & McNamara 1995) as this is suggested to improve the ecological validity of the task (Faunce 2002). However, it should be pointed out that the emotional Stroop task represents a cognitive task over and above ED status and the lack of difference between the target and neutral words may reflect attentional bias as a cognitive process that exists independently of 'disorder' status. The general slowing of processing found within the clinical group may reflect be reflective of symptoms of ED, for example the consequences of starvation or mood state (Rofey et al 2004).

### *5.2.3 Interpretation of findings related to cognitive avoidance in the context of previous research*

The previous research exploring cognitive avoidance in ED, although very limited, indicated evidence for cognitive avoidance in self-report studies (Troop & Treasure 1997; Troop, Holbery & Treasure 1998) and in those using experimental paradigms employing strategic processing tasks. This has been particularly found for those with BN psychopathology (Meyer et al 2000; Waller et al 1995). In order to extend and offer further support for this research, the present study employed an adaptation of the anagram solution task developed by Waller and colleagues (Meyer et al 2005; Waller & Meyer 1997). This study did find evidence to support the process of cognitive avoidance in ED participants for food and self-esteem threat categories, in comparison to neutral anagrams. However, these findings were compromised by the lack of a significant effect between the clinical and control groups, with post hoc results indicating that the clinical group processed the target words more quickly than controls. These findings will now be interpreted in the light of the existing research.

Parallels can be drawn between the findings of existing research and the present study. In Meyer et al's study (2005), although BN participants took longer to solve the 'ego-threat' words (i.e. those related to self-esteem), no significant differences were found on the food anagrams. Post hoc tests revealed that the clinical group were quicker to solve the food anagrams than the control group, particularly for those participants who were purely restrictive and did not use compensatory purging

behaviours (regardless of diagnosis). The restrictive participants also solved the ego-threat anagrams in similar times to the control group (Meyer et al 2005). Within non-clinical samples there is evidence to suggest that those with a lower BMI (i.e. more likely to engage in dieting or restrictive behaviour) solved threat anagrams more quickly (Waller & Meyer 1997). This is clinically important for the present study as it may indicate that having a heterogeneous clinical ED group may have obscured important effects of type of pathological eating behaviour on cognitive avoidance. This limits the conclusions that can be drawn regarding the differences between BN, AN and EDNOS diagnostic groups in terms of cognitive avoidance. However, the moderating effect of ED behaviour was explored in this study and no significant effects were found and effect sizes were small. While this may relate to the small sample size, it seems that in this study ED behaviour did not impact on anagram solution times. A more likely conclusion is that certain features of the control group and the experimental context may have had a confounding task specific effect. This will be explored further in due course.

Eating disorder psychopathology may have had an effect on the speed of processing of the anagrams. For example, Meyer et al (2005) found that having poor body image may result in faster processing of threat. In their study the BN group were significantly faster on threat words if they had an elevated Body Dissatisfaction (BD) score on the EDI (Garner 1991). This has also been found within non-clinical groups (Meyer et al 2005; Waller & Meyer 1997). As some of the clinical ED sample in the present study had BD scores in the elevated clinical range (see Appendix T), this may explain why they processed the threat words more quickly. Faster processing of disorder relevant and threat words on the anagram task might actually be indicative of hyper-attention to those cues (as opposed to cognitive avoidance) in those with a negative body image. This will now be discussed.

In a strategic task such as the anagram solution task, it is suggested that more rapid processing may be more indicative of a process of attentional bias rather than cognitive avoidance (Meyer et al 2005). It has been highlighted that these two processes may be inherently linked and may occur interdependently during stages of information processing (deRuiter & Brosschot 1994; Lavy & van den Hout 1994). Although direct relationships between the Stroop and anagram task were not



explored within the analysis of the present study, the finding for faster solution times for the clinical group may also provide evidence of attentional bias for threat cues in these participants. It is perhaps the case therefore, that attentional biases also operate within a strategic processing task (i.e. the anagram solution task). This would warrant further investigation.

Faster processing of threat-related words may also indicate a hyperattentiveness towards information that relates to the ED individual's current concerns (i.e. weight and shape or negative self-beliefs). As these types of stimuli were possibly more relevant to the individual, they may be more readily accessible in initial processing and thus the anagrams were more quickly solved. Indeed, faster processing may in itself be a form of avoidance in that quicker solution of the anagram would more readily remove the threat.

### *5.2.3 Strengths and limitations of the present study in the context of the cognitive avoidance paradigm*

This study used a relatively novel strategic processing paradigm thought to access processes of cognitive avoidance, based upon prior research (Waller & Meyer 1997; Meyer et al 2005). As this paradigm is new, the present study sought to further validate and refine it. This involved using the existing categories of food and self-esteem threat anagrams and also extending this to include body anagrams. This was done in order to bring the paradigm in line with studies using the emotional Stroop task that have primarily explored these categories. This was also done to make comparable the stimuli used across the two experimental tasks, particularly given the suggestion of the link between attentional bias and cognitive avoidance (de Ruiter & Broschot 1994; Lavy & van den Hout 1994). However, due to the lack of significant findings for this aspect of the study it may be worth exploring the anagram paradigm used more closely.

An attempt was made to match the target words chosen for the anagrams wherever possible on those used in the prior research (Waller & Meyer 1997; Meyer et al 2005). However, it was the case that these words did not appear to be adequately matched for word length or difficulty within these studies (e.g. food category words consisted of 4 letters whereas threat words consisted of up to 6 letters; Meyer et al 2005). Therefore, in the present study a decision was made to extend the

food words to include those up to a maximum of 6 letters to bring these in line with those for the self-esteem threat category (see Appendix P). This meant that food words were drawn from the wider pool of target words used in prior emotional Stroop studies. Neutral words in the prior research were again only 4 letters long so were drawn randomly from the wider pool of target words used in the Stroop literature and generated for this study to include both 5 and 6 letter words. This study was unique in its attempt to measure cognitive avoidance of body stimuli. As this was the case, the words were drawn from existing Stroop studies where possible. Generating the target and neutral stimulus words in this way meant that the norms for solution times provided by the prior research (Meyer et al 2005; Waller & Mayer 1997) were not compatible.

The logistics of this study meant that only a brief pilot could be undertaken and the primary aim of this was to test the ease of use of the computer software, not to obtain norms for the anagrams. Therefore it is possible that the words in certain categories were more complex than those in other categories. Preliminary analysis of the correlations between stimuli categories (see Appendix V) did not indicate this to be the case. However, future research would need to take more steps to ensure that anagrams used are of equal difficulty.

A further indication that the anagrams may have been too complex is reflected in the rate of error on this task. However, errors were generated largely by the control group. This may have impacted upon the findings for the anagram task, as the nature of the task would have rendered it obvious to a participant if they had made an error (i.e. they would be looking at an incorrect word solution on the screen). As the instructions requested that participants avoid error, producing incorrect solutions may have made them more attuned to their mistakes, which may have impacted on their performance times (i.e. resulted in impaired performance for reasons other than cognitive avoidance). Prior research (Waller & Meyer 1997; Meyer et al 2005) has reported no information as to error rates. The rate of error in the present study would appear to be indicative of features of the control group that will be discussed in the context of the broader limitations of the study.

### 5.3 General strengths and limitations of the study and suggestions for improvement

This study had certain strengths, including the use of mixed quasi-experimental design to test focal hypotheses with planned comparisons and the inclusion of a control group. Employing a within-subjects design allowed for the control of participant variables (i.e. keyboard skills and psychomotor ability). Many of the limitations of this study were affected to a certain extent by the time constraints and the clinical realities of the research. The limitations of the study link directly to suggestions for improvement and so these will follow on. The limitations can be described broadly in terms of those related to potential non-equivalence of groups, particular problems related to recruitment and those characteristics of the experimental tasks and context.

#### *5.3.1 Issues of power and sample size*

Due to certain recruitment difficulties, the clinical sample was somewhat underpowered, falling just short of the target of twenty seven participants for the clinical ED group (N=23). However, this did not have a deleterious effect since the power to detect a medium effect size (i.e. Cohen's  $d$  of .50) was still sufficient to detect a medium power of 75% at an alpha level of 0.05 (1 tailed). The study was compromised to some degree but the small numbers of participants in the ED behaviour groups. This limited the comparisons that could be made between the groups and therefore limited the potential conclusions which could be drawn regarding attentional bias and cognitive avoidance for those that binge-eat and those that restrict their eating. Future research could include larger samples to address this and to reduce the chance of type II errors.

As discussed above it is possible that threat stimuli may not have been powerful enough to detect differences for the clinical ED group to statistical significance, particularly for the anagram task where there was some indication of cognitive avoidance. Future studies may chose to utilise threat stimuli that may be more powerful and is more ecologically valid, such as picture stimuli (e.g. Cochrane, Barnes-Holmes, Barnes-Holmes, Stewart & Luciano 2006; Shafran et al 2007) and visual stimuli that requires a strategic engagement for the cognitive avoidance task (e.g. film; Sloan 2004).

### 5.3.2 Features of the sample

#### Clinical Group:

There were strengths in relation to the recruitment of the clinical sample, such as negotiating with services regarding ways to maximise recruitment. For example, the participants were initially informed about the research as part of routine contact with their Team clinician and this may have increased participation. A further benefit is that participants were not excluded from the study on the basis of diagnosis. Given the critique of diagnostic classifications of ED (Fairburn et al 2003; 2007; Hayes et al 1996), this was felt to be valid and may have enhanced recruitment (i.e. by not excluding the category EDNOS for example). Grouping ED patients by behaviour (i.e. binge-purge or restricting) is strongly recommended over diagnostic groups, to tease out important differences in cognitive processes that may exist between the groups (Fauce 2004; Lee & Shafran 2004). This was attempted in this study to explore the moderating effect of ED behaviour on the cognitive processes. However the small sample size may have impacted on these findings.

There was some attrition from the study at intake (N=7). Some studies have reported on the difficulties in recruiting ED populations and suggest that participation in research may vary across ED diagnoses, with more difficulties in recruiting AN participants (Hewell, Rienecke Hoste & Le Grange 2006; McDermott et al 2003). Detailed information concerning participants who declined to take part in this study was not recorded. However, given that the study was in part measuring an avoidant process it is interesting to comment that ED patients predisposed to avoidant coping styles (Eifert & Heffner, 2003), may have actually been unwilling to participate in the research.

As mentioned above there were some features specifically related to the clinical sample that due to service related issues and the logistics of the study it was not possible to adequately control for. The amount of demographic information that could be obtained was limited, for example details relating to stage of therapeutic intervention and medication. As a result the effects of these variables on attentional bias and cognitive avoidance cannot be ruled out. This is frequently overlooked in the prior literature and attempts were made to collect this data in this study.

However, due to working practices, logistical and service related issues (e.g. the accurate recording of type of therapeutic intervention) access to this information was limited and could only be commented upon in a descriptive way.

#### Control Group:

Some features of the control group (i.e. the rate of error generated on the anagram task) does raise concerns with regard to the equivalence of the groups. There was some variation between the groups that may go some way to explaining the task specific differences in error. For example, there was a significant difference in the participant's age which was not expected. This may be important as there has been some indication that age may affect the degree of attentional bias (Seddon & Waller 2000). However, there are often considerable weaknesses in how age is classified in the literature and there have been no age effects found for cognitive avoidance. Although there were no significant differences between the groups, level of English grammar and comprehension may also have had an effect, as there were more participants with English as a second language in the control group. This may have inflated the error rate and had an impact on anagram solution time. Educational ability may also have impacted on the error and anagram solution time. Future research should be mindful of these factors.

On the question of demand characteristics, it is possible that participants interpreted the task instructions differently. The control group, perhaps due to being psychology students and having some experience of experimental research, may have interpreted the goals of the task in relation to speed and may have prioritised this over accuracy. They may have had somewhat less motivation, having participated in the research in order to obtain course credit. There were variations in the experimental setting that also may have impacted upon the equivalence of the groups. These are discussed below.

### *5.3.3 Issues relating to the experimental context*

Unfortunately due to the certain logistical constraints in recruiting the clinical sample, the experimental setting was unavoidably different between the clinical and control group. This would go against the high degree of standardisation that was hoped for by introducing within group variation. For example, all participants in the control group were tested in experimental laboratories at the university. This allowed the participant to complete the tasks without involvement from the experimenter, as stated in the methodology. However, it was not always possible to test participants from the clinical group in this manner. Some participants were seen in their own homes which meant that the experimenter was sometimes present in the room. In terms of demand characteristics, this may have meant that the ED group felt more pressure to perform well under the perceived scrutiny of the experimenter. This may be particularly so when accounting for the high level of perfectionism and need for achievement characteristic of the disorders (Shafran et al 2002). This may have introduced extra variation into the experimental setting which could have confounded the group comparison between the control and clinical ED group.

### 5.4 Clinical relevance and theoretical implications

As the hypotheses relating to the emotional Stroop task were largely negative, this study cannot provide conclusive evidence of the presence of attentional bias in a clinical ED group. The impact of the study limitations on the findings have been discussed and outlined. The existing research has demonstrated the relevance of this process to ED. However, the findings of this study offer more support to those studies querying attentional bias and the use of the emotional Stroop task. Considering this, the research may be at a somewhat early stage to begin to strongly recommend therapies to address attentional biases in ED. However, given the theoretical underpinnings, biases in attention are likely to operate in ED and are worth considering in terms of what this may add to the clinical picture.

This study found some evidence for the presence of cognitive avoidance in female ED patients. Taken together with the previous research findings, it is reasonable to draw conclusions about the

likely presence of cognitive avoidance in ED patients. However, as a result of the limitations of this study this was only partially borne out. The clinical and theoretical implications for these findings will now be outlined.

#### *5.4.1 Theoretical implications of attentional biases and cognitive avoidance for eating disorders*

The theoretical overview presented in this study gave an insight into the role of cognitive processes in the maintenance of ED. Cognitive avoidance and processes of attentional bias fit within a transtheoretical model (see Figure 2) that attempts to explain the cognitive and behavioural features commonly associated with eating pathology. Figure 3 outlined the hypothesised mechanism between attentional bias and cognitive avoidance in ED, in that the information selected for processing is likely to be in line with the individual's current concerns (Harvey et al 2004; Klinger 1996). In ED these concerns might be related to eating, shape and weight (Fairburn 1997). They may also be related to information that is in line with the individual's schemas or self-beliefs (Cooper 2003; MacLeod & MacDonald, 2000; Wells & Matthews 1994; Wells 1997; 2000) and are more likely to be of negative emotional valence (Baumeister, Bratslavsky, Finkenauer & Vohs 2001; Taylor 1991). Due to the increase in negative affect that attentional biases of this nature may give rise to, an individual may seek to escape (Heatherton & Baumeister 1991; Baumeister, Heatherton & Tice 2001), or block this out in some way (Lavey 1986; Root & Fallon 1989).

The 'escape' and 'blocking' models suggest that disordered eating behaviours (i.e. binge-eating) may function to enable the individual to reduce their negative self-focus, at least in the short term. Cognitive processes of avoidance, such as dissociation (Vanderlinden, Vandereycken, van Dyke & Vertommen 1993), ruminative worry processes (Wells & Davies 1994; Wells 2000; Borkovec, 1994; 2002; Borkovec, Alcaine & Behar, 2004) and thought suppression (Johnston, Bulik & Anstiss 1999; Oliver & Huon 2001; O'Connell, Larkin & Mizes 2005) may also serve this purpose and reduce the negative emotional state in the short term.

Within the ACT model, Hayes and colleagues (1996; 1999) point out that these efforts to regulate emotion by attempting to avoid, control and suppress experience may exacerbate and perpetuate distress (Hayes, Strosahl, & Wilson, 1999) and there is good evidence that this is the case (Wegner, Schneider, Carter, & White 1987; Wegner & Zanakos 1994; John & Gross 2004; Wenzlaff & Wegner 2000; Purdon, 1999). It was interesting to note that within this study, experiential avoidance as measured by the AAQ was not an explanatory variable for cognitive avoidance or attentional bias. This is contrary to expectation, as it is likely that the construct of experiential avoidance as defined by Hayes et al (1996; 1999) would encompass both attentional and avoidant processes. This is the first study to attempt to link experiential avoidance with discrete cognitive processes and the lack of an association may be a reflection of the way that experiential avoidance is constructed within the AAQ and a result of the limitations of this study. The AAQ questionnaire requires further validation, yet in this study there were clear indications that experiential avoidance was likely to be a key feature of ED. The weight of the existing theoretical and clinical evidence would suggest that experiential avoidance plays an important role in the development and maintenance of ED (Heffner & Eifert 2004; Heffner et al 2002).

#### *5.4.2 Clinical implications of attentional biases and cognitive avoidance for eating disorders*

The presence of attentional bias and to some extent cognitive avoidance, have been established in ED for disorder relevant and schema related information. There is now scope within the research to attempt to establish the causal structure of these processes in the aetiology and maintenance of ED. It is difficult to establish this within cross-sectional designs. Longitudinal studies or studies which experimentally manipulate the processes to test out the effects on attitudes and beliefs would help to provide some evidence for a causal or maintaining function within the disorder.

It is important to understand differences in presentation between ED groups (i.e. individuals who use binge-purge or restrictive behaviours) in relation to cognitive processes. There is some indication that while diagnosis might not be of relevance to treatment (Fairburn et al 2003), type of eating-disordered behaviour might be. If individuals with restricting or binge-purge behaviours



show variation in the nature of stimuli they attend to (Ben-Tovim et al 1989; Fassino et al 2002; Perpina et al 1993) this may indicate differences in relation to the cognitive content of those individuals experiencing AN or BN disorders. If patients with AN and BN behaviours display differences in relation to the stimuli that they avoid (McManus et al 1996; Meyer et al 2005; Waller et al 1996; Waller & Meyer, 1997) this may indicate that the function of avoidance may differ by eating-disordered behaviour. Variation within the behavioural sub-groupings of ED may indicate that the therapeutic focus may need to be altered depending on the type and severity of ED behaviour. This is somewhat at odds with the proposal of a transdiagnostic approach (Fairburn et al 2003) and would warrant further exploration experimentally and therapeutically.

Attentional biases in ED are suggested to have a role in confirming an individual's negative beliefs and therefore may perpetuate these beliefs (Fairburn et al 1999; Fairburn et al 2003). Cognitive avoidance of the thoughts and affect associated with these beliefs may further strengthen the belief, strengthen the association between the affect and stimulus and therefore increase affective arousal over the longer term (Wenzlaff & Wegner 2000). If as theoretically proposed, attentional biases and cognitive avoidance do serve to maintain ED in this way, then particular clinical techniques that address them may be warranted.

This study was not able to explore the effects of therapeutic intervention on the cognitive processes. However, there is some evidence that attentional biases are ameliorated following CBT (Cooper & Fairburn 1993; Shafran 2006). If this is the case then it is possible that attentional processes do not warrant a specific intervention. They may normalise with the use of enhanced CBT for ED that focuses on aspects such as body checking which may tap into attentional processes (Fairburn et al 2003). However, specific cognitive techniques such as attentional training (Wells 2000; Papageorgio & Wells 2003) may also help to address attentional biases.

It may be that avoidant processes may be usefully addressed by using clinical approaches such as ACT (Hayes et al 1996; 1999) that highlight the long term effects of experiential avoidance in maintaining psychopathology and within treatment, emphasise the acceptance of previously avoided negative thoughts and emotions as a route to recovery. Clinically, the Trainee has experienced that therapeutic work focused on the identification of and exposure to avoided

cognitions and affect enables the learned value of avoidance to be diminished for patients. Using transtheoretical conceptualisations that highlight these processes (i.e. as in Figure 2) may assist clinicians in focusing therapeutically on processes of attention and avoidance.

### 5.5 Suggestions for further research

In carrying out this piece of research and reviewing the existing experimental evidence for attentional bias and cognitive avoidance, a number of improvements for future studies have come to light. Some of these have been briefly mentioned within the main body of the discussion but will be expanded upon here.

It would seem that differences in cognitive processes between ED diagnostic groups, or by type of eating-disordered behaviour would warrant further investigation. This is in light of variations in cognitive processing found within the literature between those displaying AN and BN psychopathology. This study was limited in its ability to investigate this more comprehensively. Since completing this research and becoming immersed in the literature, the Trainee has become increasingly aware of processes of attention and avoidance in the maintenance of ED and has incorporated this into formulations and interventions with patients. Anecdotally, the Trainee has observed that those who use binge eating are often keenly aware of their experience (both external and internal events). As a result they frequently engage in frantic attempts to avoid these experiences. It may be that those who do not use binge eating to regulate their affect may be more disconnected with their initial experience through other processes (i.e. dissociation).

The research would suggest that those displaying BN psychopathology primarily demonstrate cognitive avoidance. This would seem to indicate that those who don't purge may manage threatening information in a different way. Further exploration of this is crucial as it may suggest that the transdiagnostic conceptualisation of ED may obscure important differences in the more subtle cognitive processes. Future research would benefit from a focus on ED behaviour in combination with exploring the effects of particular therapeutic interventions on these cognitive processes.

In terms of the experimental tasks themselves, the critique of the emotional Stroop task has been commented upon. Future research may benefit from a focus on alternative paradigms to tap attentional processes (Shafran et al 2007). This may include the use of more ecologically valid stimuli such as visual stimuli in attentional tasks (i.e. pictures or film) or strategic tasks such as embedded figures tasks as measures of cognitive avoidance. Tasks that tease out the mechanisms involved in cognitive bias (i.e. vigilance towards or away from threat) are necessary. Some recent research has attempted this, which has not yet been applied to ED (Amir et al 2003; Koster et al 2005; Shafran et al 2007). Recently, within Relational-Frame Theory, the Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al 2006) has been developed. Although not specifically a measure of attentional bias or cognitive avoidance, this newly developed computer-based task is proposed to measure verbal relational networks or beliefs. This corresponds well to the ACT model. Future research could make use of the IRAP to explore the weight/shape and self-esteem related beliefs and current concerns of ED participants.

Within this study, efforts were made to improve upon the limitations of the stimuli used and their presentation. However, there are further potential ways of improving the validity of the target stimuli used. For example, carrying out pilot work in which ED participants rate a pool of target words in terms of the degree of threat, may improve the relevance to the current concerns of ED individuals. These may or may not be disorder-specific. To overcome any indications that words may differ in complexity, future studies using the anagram paradigm should employ piloting measures to ascertain norms for anagram words. This would allow significant differences for clinical groups to be more reliably demonstrated.

A strength of this study was the use of a control group of participants. However, future studies employing these paradigms should make efforts to minimise the non-equivalence of clinical and control groups. For example, this could be done by matching by age, socio-economic status, educational level and level of competency with written English. Controlling for variation between the experimental settings was a shortcoming of this research. Future studies should attempt to minimise the effects of context. This study did not employ a mood measure (other than measures

of anxiety) in the design. Future research would benefit from this as there has been some indication that mood impacts upon processes of selective attention (Rofey et al 2004). This may feasibly be the case for processes of cognitive avoidance also. Investigations into the effect of mood on specific cognitive processes is limited and further investigation employing mood measures pre and post experimental tasks may help to clarify the effect.

Finally, there is scope for conducting longitudinal studies which experimentally explore whether key cognitive processes have a maintaining role in ED. There is evidence from this study and existing research that to some extent these are normal cognitive processes which are likely to occur within the general population along a continuum. Therefore the potential role and impact of cognitive processes of attention and avoidance in the development and maintenance of the disorders requires some clarification.

## 5.6 Conclusion

This study provided some support for the presence of attentional biases and cognitive avoidance of disorder relevant and self-esteem threat information. The study had much strength in attempting to address some of the methodological shortcomings of previous research and in extending the paradigms used to encompass non-disorder-specific stimuli that may be of relevance to ED. However, some of the hypotheses for this study were unsupported. This was surprising, as anecdotally the clinical experience of the Trainee would suggest that some individuals with ED appear very connected to their initial experience (i.e. may be vigilant on automatic processing), then appear to engage in attempts to avoid the negative internal states that may arise. However, this may only be the case in those individuals who use binge-eating to regulate their affect. Future research would need to explore and address the differences in cognitive processing between ED behaviours or diagnostic groups.

There were a number of limitations to this study which may have had a bearing on the outcome. These would need to be addressed in future research. The use of the emotional Stroop task as a measure of attentional bias has been questioned and it is possible that other paradigms may tap into this process more effectively. The current study may call into question the utility of an anagram solution task as a measure of cognitive avoidance, indeed there is some suggestion that it too may measure attentional bias. Previous commentators have highlighted that these processes are not independent of one another. There is a great deal of scope for future research to attempt to tease out these mechanisms and explore their role in eating disorder psychopathology. This would help to contribute to the theoretical conceptualisations of the disorders and ultimately, may help to improve interventions for patients.

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## 7. Appendices

- Appendix A: Invitation letter for clinical participants
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- Appendix D: Consent Form for clinical participants
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- Appendix T: Distributions of questionnaire scores; box plots
- Appendix U: Preparatory analysis for Stroop task
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Doctor of Clinical Psychology Training Course  
University of Hertfordshire  
College Lane  
Hatfield  
Hertfordshire  
AL10 9AB

Dear ..... (Clinician inserts first name)

**Re: Perceptual ability and reaction time in people with eating disorders**

I am writing to you to invite you to take part in a research study that I am currently carrying out as part of a university qualification. The study aims to look at the perceptual abilities and reaction times in people who have eating disorders.

An information sheet about the study is attached. It provides an explanation about what the study involves. You are under no obligation to take part. Please read the information sheet carefully.

If you would like further information about the study or would like to be involved and are happy for me to contact you, please complete the tear off slip below and send it to: Diana Carmen, Doctor of Clinical Psychology Training Course, University of Hertfordshire, College Lane, Hatfield, AL10 9AB or email Diana.carmen@HPT.nhs.uk. Please note that this does not obligate you to being involved in the study. Alternatively, you are welcome to speak to me by ringing 01707 286 322.

Yours sincerely,  
Diana Carmen  
Chief Investigator for the research

✂ .....

- |   |                          |
|---|--------------------------|
|   | Please tick              |
| I would like more information   | <input type="checkbox"/> |
| I would like to participate in the study  | <input type="checkbox"/> |
| I give permission for Diana Carmen to contact me about the study                                  | <input type="checkbox"/> |
| I prefer to be contacted by: telephone <input type="checkbox"/> or email <input type="checkbox"/> |                          |

Telephone number/email address: \_\_\_\_\_

Name: \_\_\_\_\_ Signature: \_\_\_\_\_



## **Participant Information Sheet**

### **Study: Project investigating perceptual ability and reaction time in people with an eating disorder**

My name is Diana Carmen. I am a trainee clinical psychologist. You are being invited to take part in a research study looking at perceptual ability and reaction time in people with an eating disorder. Before you decide to take part, 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 and discuss it with others if you wish. Take time to decide whether or not you would like to take part.

#### **What is the purpose of the study?**

Some researchers think that people with eating disorders may perceive and react to things in a different way to people without eating disorders. The aim of this project is to explore perceptual abilities and reaction time in people with eating disorders. I am carrying out this research as part of a doctoral qualification.

#### **Why have I been chosen?**

You have been chosen because you have been referred to a specialist eating disorder service and have problems with your eating. People without an eating disorder are also being asked to take part in the study. The study aims recruit sixty four people.

#### **Do I have to take part?**

No, it is up to you to decide whether or not to take part. If you decide to take part, but later change your mind you are free to withdraw at any time without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the treatment or standard of care you receive from the Eating Disorders Service.

If you are happy to be contacted about the project, you can send your contact details to me (either an email address or a telephone number) and I will get in touch with you to discuss the project further and answer any questions you may have.

#### **What will I have to do?**

If you agree to take part, I will arrange a time to visit you to complete some computer based tasks which look at perceptual skills and reaction time. I will also arrange for you to complete four questionnaires which ask about eating behaviours, thoughts, worries and attitudes. You will also be asked for some information about yourself, such as your age, height and weight.

The whole of the assessment will take around an hour. If you cannot complete this in one session, then arrangements can be made for you to fill out the questionnaires before completing the computer tasks. I can arrange to meet you to carry out the assessment at the most convenient place for you, this could be at your home or at the eating disorders

clinic. If you would like some feedback about the assessment, I would be happy to provide this for you.

If you consent to take part in the study, I will look at your medical records so I can find out some information about your eating disorder and the treatment you receive.

**Will my taking part be confidential?**

Yes. All the information I collect about you will be kept strictly confidential. This means that the questionnaires will not have your name or contact details on them. Instead each questionnaire is given a number before it is given out to participants. Completed questionnaires will be kept at a secure location which will only be accessible by the researcher. Consent forms with your signature on will be kept separately from the actual questionnaires.

If you agree, I will put a copy of the information sheet in your medical folder and write to your GP to let the people who work with you know that you have taken part in the project. If you do not want this to happen, you can let me know on the Consent Form and it will in no way affect the treatment you receive.

If I become concerned during the research visit that you may harm yourself or someone else, then I will need to contact your doctor or the people in your team to let them know. I will try to discuss this with you first.

**What will happen to the results of the project?**

Once all the assessments have been completed, I will write a report to be published as a doctoral thesis for the qualification of Doctor of Clinical Psychology at University of Hertfordshire. I also intend to publish the findings of the project in an academic publication so that it can be useful to other professionals working with people with an eating disorder. If you would like a copy of the report, I can make this available to you from July 2007. You will not be personally identifiable in any publication or report.

**What are the benefits of taking part?**

It is hoped that this research will help develop psychological understanding of people who have eating disorders.

**What if something goes wrong?**

In the unlikely event that participating in this research has caused you distress in some way, please do not hesitate to raise your concerns with the researcher who will be able to advise you on where you may be able to access further help. If you wish to make a complaint, you can contact the Complaints Manager, Trust Head Office, 99 Waverley Road, St Albans, Hertfordshire AL3 5TL; telephone 01727 897225 or email [Complaints@hpt.nhs.uk](mailto:Complaints@hpt.nhs.uk).

**Who has reviewed this study?**

This study has been reviewed by Hertfordshire Research Ethics Committee.

Thank you for taking time to read this

**Contact details of the researcher:** Diana Carmen, Email address: [Diana.Carmen@HPT.nhs.uk](mailto:Diana.Carmen@HPT.nhs.uk), Telephone number: 01707 286 322. Postal address: Diana Carmen, Doctor of Clinical Psychology Training Course, University of Hertfordshire, Hatfield, Herts. AL10 9AB



## Participant Information Sheet

### **Study: Project investigating perceptual ability and reaction time**

My name is Diana Carmen. I am a trainee clinical psychologist. You are being invited to take part in a research study looking at perceptual ability and reaction time in people. Before you decide to take part, 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 and discuss it with others if you wish. Take time to decide whether or not you would like to take part.

#### **What is the purpose of the study?**

Some researchers think that people with eating disorders may perceive and react to things in a different way to people without eating disorders. The aim of this project is to explore perceptual abilities and reaction time in people who have an eating disorder compared to those who do not. I am carrying out this research as part of a Doctoral qualification.

#### **Who is taking part in the study?**

This research involves two groups of people. One group will contain people that are experiencing an eating disorder, the other group will contain people who are not experiencing an eating disorder. This study aims to recruit around sixty four people in total.

#### **Do I have to take part?**

No. If you do not want to take part, or you change your mind *at any time* during your participation in this study, you do not need to give a reason. Participation is entirely voluntary and you can withdraw at any time.

#### **What will I have to do?**

If you agree to take part, I will arrange a time for you to complete some computer based tasks which look at perceptual skills and reaction time. I will also arrange for you to complete four questionnaires which ask about thoughts, worries and attitudes, including eating behaviours. You will also be asked for some information about yourself, such as your age, height and weight.

The whole of the assessment will take no more than an hour and will take place at the University of Hertfordshire. If you would like some feedback about the assessment, I would be happy to provide this for you.

#### **Will my taking part be confidential?**

Yes. All the information I collect about you will be kept strictly confidential. This means that the questionnaires will not have your name or details on it. Instead each questionnaire is given a number before it is given out to participants. Completed questionnaires will be kept at a secure location which will only be accessible by the researcher. Consent forms with your signature on will be kept separately from the actual questionnaires.

**What will happen to the results of the project?**

Once all the assessments have been completed, I will write a report to be published as a doctoral thesis for the qualification of Doctor of Clinical Psychology at University of Hertfordshire. I also intend to publish the findings of the project in an academic publication so that it can be useful to other professionals working with people with an eating disorder. If you would like a copy of the report, I can make this available to you from July 2007. You will not be personally identifiable in any publication or report.

**What are the benefits of taking part?**

It is hoped that this research will help develop psychological understanding of people who have eating disorders.

**What if I have questions or concerns?**

If you have any further questions about the research, please feel free to contact the researcher via email, telephone or post, details of which are below. In the unlikely event that participating in this research has caused you distress in some way, please do not hesitate to contact the researcher who will be able to advise you on where you may be able to access further help through the University of Hertfordshire's support systems.

**Who has reviewed this study?**

This study has been reviewed by Hertfordshire Research Ethics Committee and the University of Hertfordshire Research Ethics Committee.

Thank you for taking time to read this

**Contact details of the researcher:** Diana Carmen, Email address: [Diana.Carmen@HPT.nhs.uk](mailto:Diana.Carmen@HPT.nhs.uk), Telephone number: 01707 286 322. Postal address: Diana Carmen, Doctor of Clinical Psychology Training Course, University of Hertfordshire, Hatfield, Herts. AL10 9AB



CONSENT FORM

**Study: Project investigating perceptual abilities and reaction time in people with eating disorders**

Please tick the box if you agree

I confirm that I have read the information sheet for the above project and have had the opportunity to ask questions.

I understand that my taking part is voluntary and that I am free to withdraw at anytime, without giving any reason, without my medical care being affected.

I understand that sections of my medical notes may be looked at by the researcher where it is relevant to my taking part in the research. I give permission for the researcher to have access to my records.

I give permission for an information sheet to be put into my medical notes, or to be sent to my doctor.

I agree to take part in the above project.

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

1 copy for participant, 1 for researcher, 1 to be kept with medical notes.





CONSENT FORM

**Study: Project investigating perceptual abilities and reaction time in people with and without eating disorders**

Please tick the box if you agree

I confirm that I have read the information sheet for the above project and have had the opportunity to ask questions.

I understand that my taking part is voluntary and that I am free to withdraw at anytime, without giving any reason.

I understand that my taking part will be confidential and I will not be personally identifiable in the research

I agree to take part in the above project.

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

1 copy for participant, 1 for researcher.



Appendix F

Doctor of Clinical Psychology Training Course  
University of Hertfordshire  
College Lane  
Hatfield  
Hertfordshire  
AL10 9AB

Te: 01707 286322  
email: diana.carmen@HPT.nhs.uk

Dear Dr.....

**Re (participants name & date of birth)**

**Study: Cognitive processing of disorder-relevant and self esteem threat information in female eating disorder patients: the role of attentional bias and cognitive avoidance**

The above named patient has consented to take part in a study investigating cognitive processes in people with eating disorders. Please find enclosed a copy of the participant information sheet detailing the study for your records.

If you have any questions or concerns regarding this research study, or if you would like a copy of the report when available, please contact Diana Carmen, Chief Investigator for the study, at the address above.

Yours sincerely,

Diana Carmen  
Chief Investigator for the research

**Debrief Statement (all participants)**

Thank you for taking part in this study. Sometimes when psychologists do research it is not always possible to tell you ahead of time specifically what we are looking at. This is because when we want to test certain thinking abilities that are more automatic, we can't tell you exactly what they are because that would draw your awareness to them and we would no longer be able to test the abilities.

You were told that this study was about perceptual ability and reaction time in eating disorders. The computer tests were specifically looking at how you responded to different types of words: food, body and negative self esteem words compared to neutral words.

When you were completing the first task on the computer, it was measuring how much you were distracted by particular words, not how good you were at naming the colour quickly. The computer recorded how long it took you to respond to each different type of word. Research tells us that people with eating disorders tend to take longer to respond to food and body size words and your scores will help to show if that is true or not.

When you were solving the anagrams, the computer was recording how long it took you to solve each different type of word. One of the questions this study is hoping to answer is whether people with eating disorders avoid words related to food, body and self esteem more than other words. One of the ways we can test this is by measuring the time it took you for each type of word.

Your scores will be put into a group with those of other people with eating disorders taking part in the research and will be compared to a group of people without an eating disorder.

The other aspects of the study are as stated in the information sheet.

Do you have any questions?

If you would like individual feedback on your performance, I am happy to provide this for you at a later date.

Thank you once again for taking part in this study.

\*Clinical Group

## BACKGROUND INFORMATION QUESTIONNAIRE

Date of Birth:	Current Height:	Current weight:
Current Occupation:		
Highest qualification (e.g. GCSE, HND etc)		
Marital Status:		
What age did you first have problems with your eating?		

The following questions are about your eating. Please circle the answer that applies best to you:

- Do you ever fast for a whole day?      **Yes**                      **No**
  
- If yes, how often is this?      **Have once**                      **now and then**
  
- once a week**                                      **2-3 times a week**
  
- every second day**                                      **every day**
  
- Do you ever binge on large amounts of food?      **Yes**                      **No**
  
- If you do binge, how often is this?:      **Hardly ever**                      **once a month**
  
- once a week**                                      **2-3 times a week**
  
- daily**                                      **2-3 times a day**

Do you do any of the following to help you lose weight? (please tick):

	Never	Occasionally	1 per week	2-3 times a week	Daily	2-3 times a day	5 or more times per day
Exercise							
Take diet pills							
Take diuretics (water pills)							
Take laxatives							
Make yourself vomit							

*\*Control Group*

**BACKGROUND INFORMATION QUESTIONNAIRE**

Date of Birth:	Current Height:	Current weight:
Current Occupation:		
Highest qualification (e.g. GCSE, HND etc)		
Marital Status:		
When were you last on a diet (if ever)?		

**INSTRUCTIONS**

First, write your name and the date on the EDI-3 Answer Sheet. Your ratings on the items below should be circled on the Answer Sheet. The items ask about your attitudes, feelings, and behaviors. 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 on the Answer Sheet. For example, if your rating for an item is **OFTEN**, you would circle the **"O"** for that item on the Answer Sheet.

Respond to *all* of the items, making sure that you circle the letter for the rating that is true about you. **DO NOT ERASE!** If you need to change an answer, mark an "X" through the incorrect letter, and then circle the correct one.

---

1. I eat sweets and carbohydrates without feeling nervous.
2. I think that my stomach is too big.
3. I wish that I could return to the security of childhood.
4. I eat when I am upset.
5. I stuff myself with food.
6. I wish that I could be younger.
7. I think about dieting.
8. I get frightened when my feelings are too strong.
9. I think that my thighs are too large.
10. I feel ineffective as a person.
11. I feel extremely guilty after overeating.
12. I think that my stomach is just the right size.
13. Only outstanding performance is good enough in my family.
14. The happiest time in life is when you are a child.
15. I am open about my feelings.
16. I am terrified of gaining weight.
17. I trust others.
18. I feel alone in the world.
19. I feel satisfied with the shape of my body.
20. I feel generally in control of things in my life.
21. I get confused about what emotion I am feeling.
22. I would rather be an adult than a child.
23. I can communicate with others easily.
24. I wish I were someone else.
25. I exaggerate or magnify the importance of weight.
26. I can clearly identify what emotion I am feeling.

(continued)

27. I feel inadequate.
28. I have gone on eating binges where I felt that I could not stop.
29. As a child, I tried very hard to avoid disappointing my parents and teachers.
30. I have close relationships.
31. I like the shape of my buttocks.
32. I am preoccupied with the desire to be thinner.
33. I don't know what's going on inside me.
34. I have trouble expressing my emotions to others.
35. The demands of adulthood are too great.
36. I hate being less than best at things.
37. I feel secure about myself.
38. I think about bingeing (overeating).
39. I feel happy that I am not a child anymore.
40. I get confused as to whether or not I am hungry.
41. I have a low opinion of myself.
42. I feel that I can achieve my standards.
43. My parents have expected excellence of me.
44. I worry that my feelings will get out of control.
45. I think my hips are too big.
46. I eat moderately in front of others and stuff myself when they're gone.
47. I feel bloated after eating a normal meal.
48. I feel that people are happiest when they are children.
49. If I gain a pound, I worry that I will keep gaining.
50. I feel that I am a worthwhile person.
51. When I am upset, I don't know if I am sad, frightened, or angry.
52. I feel that I must do things perfectly or not do them at all.
53. I have the thought of trying to vomit in order to lose weight.
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).
55. I think that my thighs are just the right size.
56. I feel empty inside (emotionally).
57. I can talk about personal thoughts or feelings.
58. The best years of your life are when you become an adult.
59. I think my buttocks are too large.
60. I have feelings I can't quite identify.

*(continued)*



61. I eat or drink in secrecy.
62. I think that my hips are just the right size.
63. I have extremely high goals.
64. When I am upset, I worry that I will start eating.
65. People I really like end up disappointing me.
66. I am ashamed of my human weaknesses.
67. Other people would say that I am emotionally unstable.
68. I would like to be in total control of my bodily urges.
69. I feel relaxed in most group situations.
70. I say things impulsively that I regret having said.
71. I go out of my way to experience pleasure.
72. I have to be careful of my tendency to abuse drugs.
73. I am outgoing with most people.
74. I feel trapped in relationships.
75. Self-denial makes me feel stronger spiritually.
76. People understand my real problems.
77. I can't get strange thoughts out of my head.
78. Eating for pleasure is a sign of moral weakness.
79. I am prone to outbursts of anger or rage.
80. I feel that people give me the credit I deserve.
81. I have to be careful of my tendency to abuse alcohol.
82. I believe that relaxing is simply a waste of time.
83. Others would say that I get irritated easily.
84. I feel like I am losing out everywhere.
85. I experience marked mood shifts.
86. I am embarrassed by my bodily urges.
87. I would rather spend time by myself than with others.
88. Suffering makes you a better person.
89. I know that people love me.
90. I feel like I must hurt myself or others.
91. I feel that I really know who I am.

Additional copies available from:

**PAR** Psychological Assessment Resources, Inc.  
16204 N. Florida Avenue • Lutz, FL 33549 • 1.800.331.8378 • www.parinc.com

Please circle your answer on the scale below. The items ask about your attitudes, feelings and behaviours to food or eating.

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 on the scale below. 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, mark an ‘X through the incorrect letter, and then circle the correct one.

**A = ALWAYS U = USUALLY O = OFTEN S = SOMETIMES R = RARELY N = NEVER**

---

I eat sweets and carbohydrates without feeling nervous	A	U	O	S	R	N
I think that my stomach is too big.	A	U	O	S	R	N
I eat when I am upset	A	U	O	S	R	N
I stuff myself with food	A	U	O	S	R	N
I think about dieting.	A	U	O	S	R	N
I think that my thighs are too large.	A	U	O	S	R	N
I feel extremely guilty after overeating.	A	U	O	S	R	N
I think that my stomach is just the right size.	A	U	O	S	R	N
I am terrified of gaining weight	A	U	O	S	R	N
I feel satisfied with the shape of my body.	A	U	O	S	R	N
I exaggerate or magnify the importance of weight	A	U	O	S	R	N

**A = ALWAYS U = USUALLY**

**O = OFTEN**

**S = SOMETIMES**

**R = RARELY**

**N = NEVER**

---

I have gone on eating binges where I felt that I could not stop.	A	U	O	S	R	N
I like the shape of my buttocks.	A	U	O	S	R	N
I am preoccupied with a desire to be thinner	A	U	O	S	R	N
I think about bingeing (overeating)	A	U	O	S	R	N
I think my hips are too big.	A	U	O	S	R	N
I eat moderately in front of others and stuff myself when they are gone.	A	U	O	S	R	N
I feel bloated after eating a normal meal.	A	U	O	S	R	N
If I gain a pound, I worry that I will keep on gaining	A	U	O	S	R	N
I have the thought of trying to vomit in order to lose weight.	A	U	O	S	R	N
I think that my thighs are just the right size.	A	U	O	S	R	N
I think that my buttocks are too large.	A	U	O	S	R	N
I eat or drink in secrecy	A	U	O	S	R	N
I think that my hips are just the right size.	A	U	O	S	R	N
When I am upset, I worry that I will start eating	A	U	O	S	R	N

### Thought Control Questionnaire (TCQ)

### Appendix K

Most people experience unpleasant and/or unwanted thoughts (in verbal and/or picture form), which can be difficult to control. We are interested in the techniques that you *generally* use to control such thoughts. Below are a number of things that people do to control these thoughts. Please read each statement carefully, and indicate how often you use each technique by *circling* the appropriate number. There are no right or wrong answers. Do not spend too much time thinking about each one.

*When I experience an unpleasant / unwanted thought:*

	<b>NEVER</b>	<b>SOMETIMES</b>	<b>OFTEN</b>	<b>ALMOST ALWAYS</b>
1. I call to mind positive images instead	1	2	3	4
2. I tell myself not to be so stupid	1	2	3	4
3. I focus on the thought	1	2	3	4
4. I replace the thought with a more trivial bad thought	1	2	3	4
5. I don't talk about the thought to anyone	1	2	3	4
6. I punish myself for thinking the thought	1	2	3	4
7. I dwell on other worries	1	2	3	4
8. I keep the thought to myself	1	2	3	4
9. I occupy myself with work instead	1	2	3	4
10. I challenge the thought's validity	1	2	3	4
11. I get angry at myself for having the thought	1	2	3	4
12. I avoid discussing the thought	1	2	3	4
13. I shout at myself for having the thought	1	2	3	4
14. I analyse the thought rationally	1	2	3	4

	<b>NEVER</b>	<b>SOMETIMES</b>	<b>OFTEN</b>	<b>ALMOST ALWAYS</b>
15. I slap or pinch myself to stop the thought	1	2	3	4
16. I think pleasant thoughts instead	1	2	3	4
17. I find out how my friends deal with these thoughts	1	2	3	4
18. I worry about more minor things instead	1	2	3	4
19. I do something that I enjoy	1	2	3	4
20. I try to reinterpret the thought	1	2	3	4
21. I think about something else	1	2	3	4
22. I think more about the more minor problems I have	1	2	3	4
23. I try a different way of thinking about it	1	2	3	4
24. I think about past worries instead	1	2	3	4
25. I ask my friends if they have similar thoughts	1	2	3	4
26. I focus on different negative thoughts	1	2	3	4
27. I question the reasons for having the thought	1	2	3	4
28. I tell myself that something bad will happen if I think the thought	1	2	3	4
29. I talk to a friend about the thought	1	2	3	4
30. I keep myself busy	1	2	3	4

**Please check that you have answered all of the questions in the questionnaire pack. Thank you.**

Anxious Thoughts Inventory (AnTI) (Wells, 1994)

**Instructions:** A number of statements which people have used to describe their thoughts and worries are given below. Read each statement and put a circle around the most appropriate number to indicate how often you have these thoughts and worries.

**Do not spend too much time on each statement. There are no right or wrong answers and the first response to each item is often the most accurate.**

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
1. I worry about my appearance	1	2	3	4
2. I think I am a failure	1	2	3	4
3. When looking to my future I give more thought to the negative things than the positive things that might happen to me	1	2	3	4
4. If I experience unexpected physical symptoms I have a tendency to think the worst possible thing is wrong with me	1	2	3	4
5. I have thoughts about becoming seriously ill	1	2	3	4
6. I have difficulty clearing my mind of repetitive thoughts.	1	2	3	4
7. I worry about having a heart attack or cancer.	1	2	3	4
8. I worry about saying or doing the wrong things when among strangers.	1	2	3	4
9. I worry about my abilities not living up to other people's expectations.	1	2	3	4
10. I worry about my physical health.	1	2	3	4

	<b>ALMOST NEVER</b>	<b>SOMETIMES</b>	<b>OFTEN</b>	<b>ALMOST ALWAYS</b>
11. I worry that I cannot control my thoughts as well as I would like to.	1	2	3	4
12. I worry that people don't like me.	1	2	3	4
13. I take disappointments so keenly that I can't put them out of my mind.	1	2	3	4
14. I get embarrassed easily.	1	2	3	4
15. When I suffer from minor illnesses such as a rash I think it is more serious than it really is.	1	2	3	4
16. Unpleasant thoughts enter my head against my will.	1	2	3	4
17. I worry about my failures and my weaknesses.	1	2	3	4
18. I worry about not being able to cope in life as adequately as others seem to.	1	2	3	4
19. I worry about death.	1	2	3	4
20. I worry about making a fool of myself.	1	2	3	4
21. I think I am missing out on things in life because I worry too much.	1	2	3	4
22. I have repetitive thoughts such as counting or repeating phrases.	1	2	3	4

**The Acceptance & Action Questionnaire (AAQ) (Hayes et al. 2004)**

Below you will find a list of statements. Please rate how much each statement applies to you.

Use the following scale to make your choice.

<b>Never true</b>	<b>very seldom true</b>	<b>seldom true</b>	<b>sometimes true</b>	<b>frequently true</b>	<b>almost always true</b>	<b>always true</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

- |  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| 1. I'm able to take action on a problem, even when I fear I may get it wrong                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. When I feel depressed or anxious, I'm unable to take care of my responsibilities          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I try to suppress thoughts and feelings I don't like by just not thinking about them.     | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I rarely worry about getting my anxieties, worries and feelings under control.            | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. In order for me to do something important, I have to have all my doubts worked out.       | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I'm not afraid of my feelings.  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. If I could magically remove all painful experiences I've had in my life, I would do so.   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. It's OK to feel depressed or anxious  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. It is unnecessary for me to learn to control my feelings in order to handle my life well. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I try hard to avoid feeling depressed or anxious.  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |



<b>Never true</b>	<b>very seldom true</b>	<b>seldom true</b>	<b>sometimes true</b>	<b>frequently true</b>	<b>almost always true</b>	<b>always true</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

11. I take action on a problem, even when I fear I may get it wrong.	1	2	3	4	5	6	7
12. I am in control of my life.	1	2	3	4	5	6	7
13. When I compare myself to other people, it seems that most of them are handling their live better than I do.	1	2	3	4	5	6	7
14. A person who is really “together” should not struggle with things the way I do.	1	2	3	4	5	6	7
15. There are not many activities that I stop doing when I am depressed or anxious.	1	2	3	4	5	6	7
16. Anxiety is bad.	1	2	3	4	5	6	7

**On screen Instructions for Stroop:**

You will be asked to complete 3 tasks.

The first perceptual task is a colour naming experiment. When the task starts, some everyday words will appear on the screen in different colours. Your task is to identify the colour of the word as quickly as you can.

You are to press the key on the keyboard that matches the colour that the word on the screen is written in.

Do not make any mistakes.

You will be timed for the task.

**Stroop Stimuli**

Food	Food ctrl	Body	Body ctrl	Threat	Threat ctrl
butter	button	waist	wheel	failure	filing
pastry	penny	large	lemur	worthless	wrapping
diet	draw	stomach	survey	helpless	heron
crisps	crane	hips	hare	deprived	design
cookie	cushion	figure	feather	jeered	jackdaw
meal	mail	massive	money	isolated	industry
dinner	donkey	thin	tilt	rejected	reindeer
chips	chain	huge	hawk	mocked	modem
chocolate	committee	fat	far	horrible	hornet
potato	piano	round	rabbit	lonely	ladder
toast	toad	thighs	tools	inferior	iguana
snack	socks	monstrous	mongoose	bad	bike

**On screen Instructions for Digits Forward:**

The next task involves repeating some numbers.

In a moment some numbers will appear briefly on the screen.

When the numbers disappear you are to type in the numbers you have seen in the **exact** order in which they were presented onscreen.

Try not to make any mistakes.

You will be timed for this task.

1 – 7

6 – 3

5 – 8 – 2

6 – 9 – 4

6 – 4 – 3 – 9

7 – 2 – 8 – 6

4 – 2 – 7 – 3 – 1

7 – 5 – 8 – 3 – 6

6 – 1 – 9 – 4 – 7 – 3

5 – 9 – 2 – 6 – 1 – 7

**On screen Instructions for Digits Backward:**

In a moment some more numbers will appear briefly on the screen.

This time, when the numbers disappear you are to type in the numbers you have seen in the **reverse** order in which they were presented onscreen. i.e type them backwards

Try not to make any mistakes.

You will be timed for this task.

2 – 4

5 – 7

6 – 2 – 9

4 – 1 – 5

3 – 2 – 7 – 9

4 – 9 – 6 – 8

1 – 5 – 2 – 8 – 6

6 – 1 – 8 – 4 – 3

5 – 3 – 9 – 4 – 1 – 8

7 – 2 – 4 – 8 – 5 – 6

**On screen Instructions - Anagram Task**

Your next task is to solve some anagrams. Anagrams are jumbled up letters that make a word.

Work as quickly as you can to solve the anagrams. Do not make any mistakes. Type your answer below the jumbled letters.

When have solved the anagram, press the return key and the next anagram will appear.

**Anagram Stimuli**

<b>FOOD</b>	<b>BODY</b>	<b>THREAT</b>	<b>CNTRL</b>
NUTS (TUSN)	HEAVY (AHYEV)	FAIL (LFIA)	CALF (LACF)
BREAD (ABDER)	BIG (BGI)	INSULT (TULSNI)	HIRE (REIH)
CREAM (RMEAC)	WEIGHT (ETWIGH)	DRAB(RADB)	WATCH(TWCAH)
CAKE (EAKC)	CURVY (RVCYU)	DULL(LUDL)	HEDGE (EHEGD)
CHEESE (ESEHCE)	HUGE (GUEH)	UGLY (GLUY)	PENCIL (CENPLI)
SUGAR (GARUS)	SHAPE (PASEH)	ALONE (NELOA)	BIT (ITB)
PICNIC (NCPICI)	BULKY (KLYUB)	DUMB(BUDM)	DATA(TADA)
MILK (KMIL) (LEEGA)	BODY (DBYO)	EMPTY(TEMP)	EAGLE



## Hertfordshire 1 Research Ethics Committee

Ambulance Training Centre  
VIA LOCATION CODE Q7  
QEII Hospital  
Howlands  
Welwyn Garden City  
Hertfordshire  
AL7 4HQ

Telephone: 01707 362583  
Facsimile: 01707 394475

14 September 2006

Ms Diana M Carmen  
Trainee Clinical Psychologist  
University of Hertfordshire  
Doctor of Clinical Psychology Training Course  
University of Hertfordshire  
College Lane, Hatfield  
AL10 9AB

Dear Ms Carmen

**Full title of study:** Cognitive processing of disorder-relevant and self esteem threat information in female eating disorder patients: the role of attentional bias and cognitive avoidance

**REC reference number:** 06/Q0201/59

Thank you for your letter of 30 August 2006, responding to the Committee's request for further information on the above research and submitting revised documentation.

The Vice-Chair has considered the further information on behalf of the Committee.

### **Confirmation of ethical opinion**

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

### **Ethical review of research sites**

The Committee has designated this study as exempt from site-specific assessment (SSA). There is no requirement for [other] Local Research Ethics Committees to be informed or for site-specific assessment to be carried out at each site.

### **Conditions of approval**

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

### **Approved documents**

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Application		31 July 2006
Investigator CV		27 July 2006
Protocol	4	27 July 2006
Covering Letter		28 July 2006
Summary/Synopsis	1	28 July 2006
Letter from Sponsor		28 July 2006
Compensation Arrangements		01 August 2005
Questionnaire: EDI 3 for controls		
Questionnaire: TCQ		
Questionnaire: AAQ		
Questionnaire: AnTI		
Questionnaire: EDI 3		
Letter of invitation to participant		26 July 2006
GP/Consultant Information Sheets	1	26 July 2006
Participant Information Sheet: Clinical group	2	30 August 2006
Participant Information Sheet: Controls	1	30 August 2006
Participant Information Sheet: PIS	1	26 July 2006
Participant Consent Form: Consent	1	26 July 2006
Participant Consent Form: Controls	1	30 August 2006
Response to Request for Further Information		30 August 2006
C.V. supervisor		11 July 2006
Honorary contract		27 July 2006
Debrief statement	1	26 July 2006
UH Finance		05 July 2006
C.V. Secondary supervisor		
Neutral computer	1	27 July 2006
Anagram computer	1	26 July 2006
Stroop computer	1	26 July 2006
Demographics	1	26 July 2006

### Research governance approval

You should arrange for the R&D department at all relevant NHS care organisations to be notified that the research will be taking place, and provide a copy of the REC application, the protocol and this letter.

All researchers and research collaborators who will be participating in the research must obtain final research governance approval before commencing any research procedures. Where a substantive contract is not held with the care organisation, it may be necessary for an honorary contract to be issued before approval for the research can be given.

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**06/Q0201/59**

**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

  
**Dr Justin Harrison**  
**Vice Chair**

Email: jane.winter@nhs.net

*Enclosures:*

*Standard approval conditions [SL-AC1 for CTIMPs, SL-AC2 for other studies]*

Copy to:

University of Hertfordshire  
Doctor of Clinical Psychology Training Course  
College Lane  
Hatfield  
[R&D Department for NHS care organisation at lead site]



Diana Carmen  
Doctor of Clinical Psychology Training Course  
University of Hertfordshire  
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Hertfordshire  
AL10 9AB

R&D Office  
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Howlands  
Welwyn Garden City  
AL7 4HQ

Tel. 01707 369058  
Fax. 01707 365169  
e-mail t.gale@herts.ac.uk

1<sup>st</sup> August 2006

Dear Diana

**Cognitive Processing of disorder relevant and self esteem threat information in female eating disorder patients: the role of attentional bias and cognitive avoidance**

Thank-you for sending me the above protocol and registration form. I understand that you will be carrying out this research as part of your Clinical Psychology Doctorate under the supervision of Dr Saskia Keville and Dr Madeleine Tatham.

I noticed that the study is referred to under several different titles across the different documents you sent me (for example, the consent form and patient information sheet use a title that is completely different to either the long or short title given on the CORC form; one says cognitive, the other says perceptual). This is not a major issue with regard to R&D approval but it may get picked up on by the LREC when they review your application.

Your study has been reviewed and is now registered with, and conditionally approved by, the HPT R&D Office. Final approval is contingent upon confirmation of ethical approval from the Herts LREC.

I wish you good luck in completing this research and would be grateful if you would keep me updated on how the study progresses.

With kind regards,

**Tim M Gale Ph.D.**  
R&D Manager



## PSYCHOLOGY DEPARTMENT

***This form accompanies a submission by a student of a research proposal for ethical approval. It will be seen by yourself for Chair's Action. Please respond promptly and please give enough detail to enable appropriate action to be taken.***

***Please email the form to [psyethics@herts.ac.uk](mailto:psyethics@herts.ac.uk)***

**Investigator** Diana Maria Carmen

**Title** Cognitive processing of disorder-relevant and self esteem threat information in female eating disorder patients: the role of attentional bias and cognitive avoidance

**Date submitted** 4 September 2006

**Considered by**

**Date ER1 returned**

1(a).....Can proceed under the named protocol without amendment.

1(b) ...✓.....Can proceed, but please take into account the following suggestions/comments:

This application is an example of clarity and detail. It was a pleasure to read it. My only comment is that the Psychology Ethics Committee has a protocol for dealing with situations when non-clinical participants are administered sensitive questionnaires (e.g., BDI). As pointed out in the guidelines (available on student intranet) all participants of the study are issued with a UH leaflet "Mental well-being and support available". These leaflets can be obtained directly from the chair of Ethics Committee, Lia Kvavilashvili who keeps them in her office (2H264 in CP Snow).

2. .... More information needed for making a judgment about ethical soundness of the study.

*Please be as specific as possible about what your ethical concerns are and what information you require.*

3. .... This proposal raises ethical issues which I think should be considered by the Ethics Committee before approval is given (i.e., Box B should have been ticked in the form).

*Please be as specific as possible about what your concerns are and why Box B should have been ticked*

**Psychology Department Research Project**

**Student Investigator:** Diana Maria Carmen  
**Supervisor:** Dr Saskia Kevillee & Joerg Schulz  
**Title:** Cognitive processing of disorder-relevant and self esteem threat information in female eating disorder patients: the role of attentional bias and cognitive avoidance.

**Registration Protocol Number** PSY /09/06/

The above research project was approved on 18 September 2006 by the Ethics Committee of the Psychology Department under delegated authority from the Ethics Committee of the University of Hertfordshire.



Signed

Date: 18 September 2006

Dr. Lia Kvavilashvili  
Chair  
Ethics Committee, Psychology Department

-----  
**I confirm that I have followed the ethics protocol approved for this project**

Signed (student) \_\_\_\_\_

date \_\_\_\_\_

**As far as I can ascertain, the above student has followed the ethics protocol approved for this project.**

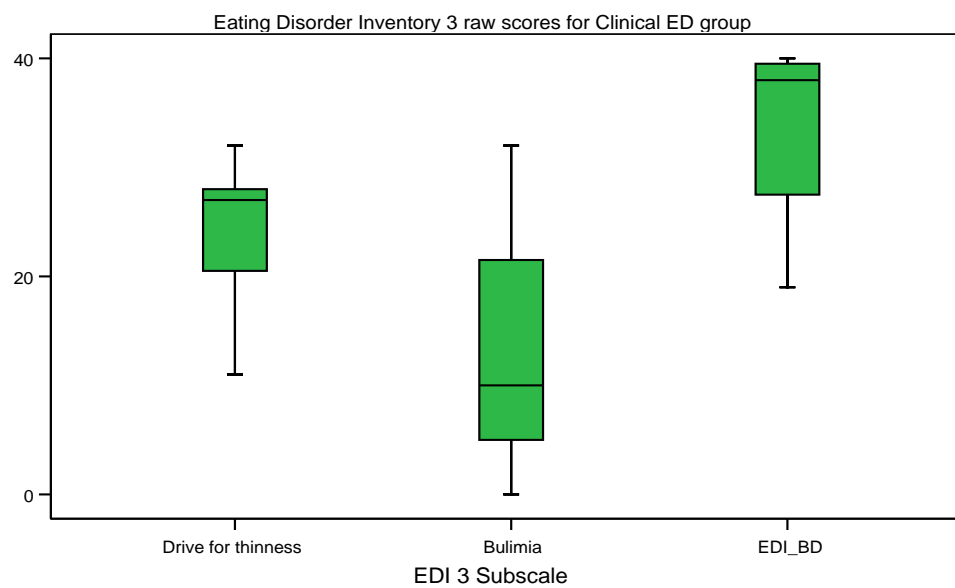
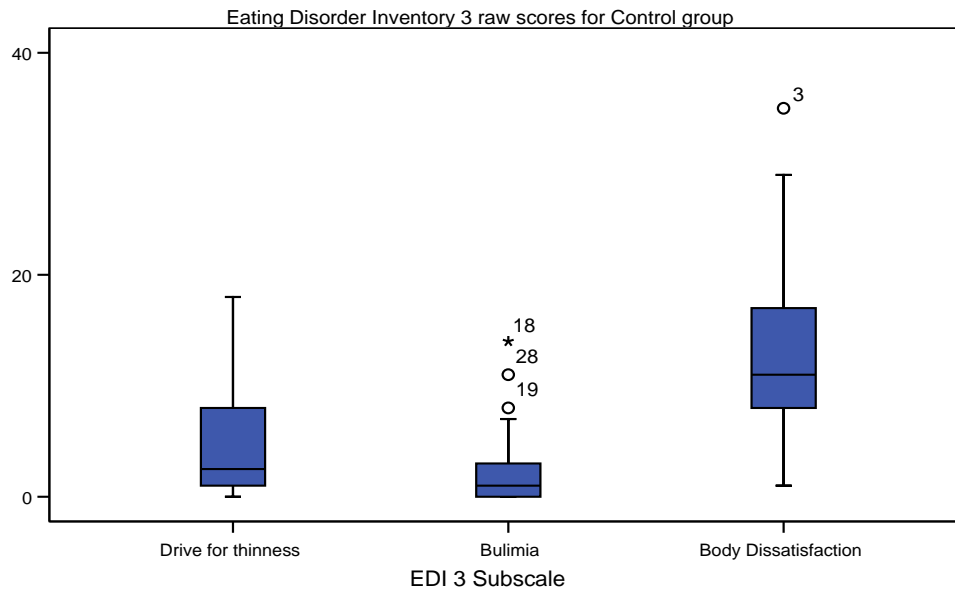
Signed (supervisor) \_\_\_\_\_

date \_\_\_\_\_

## Distributions of scores on the clinical measures between groups.

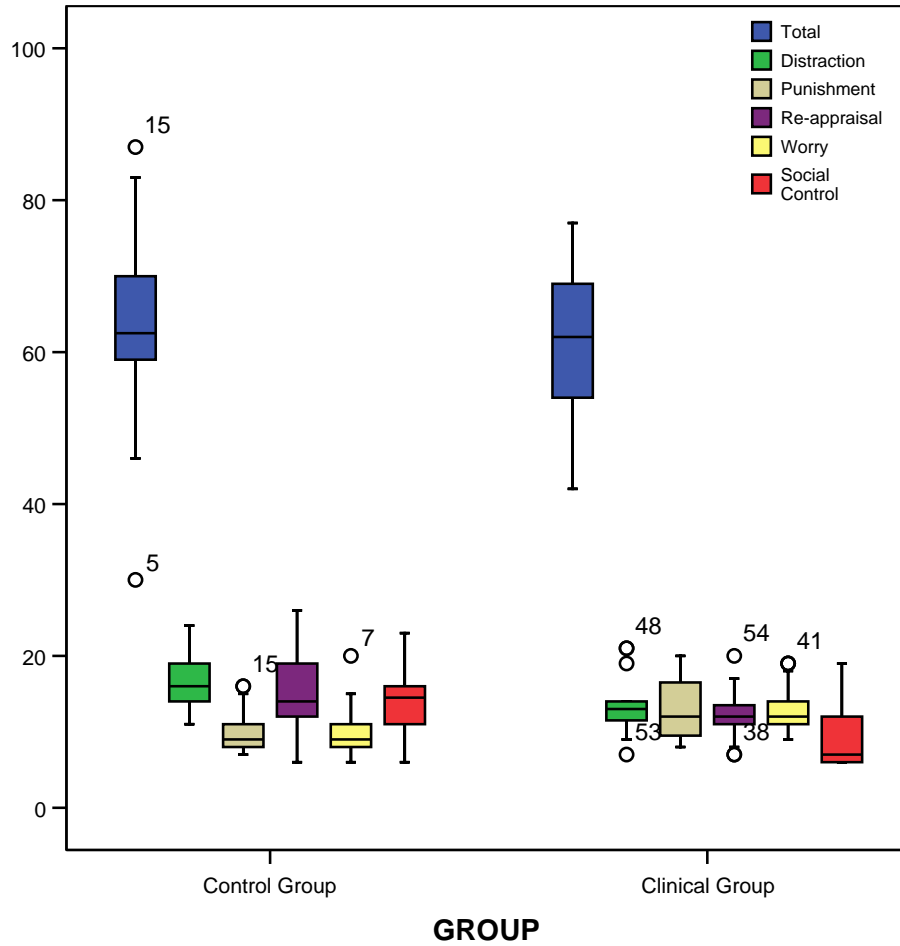
### Eating Disorders Inventory-3

Box plots displaying the mean raw scores for the three eating disorder pathology subscales: DT, B and BD for the control & clinical ED groups.



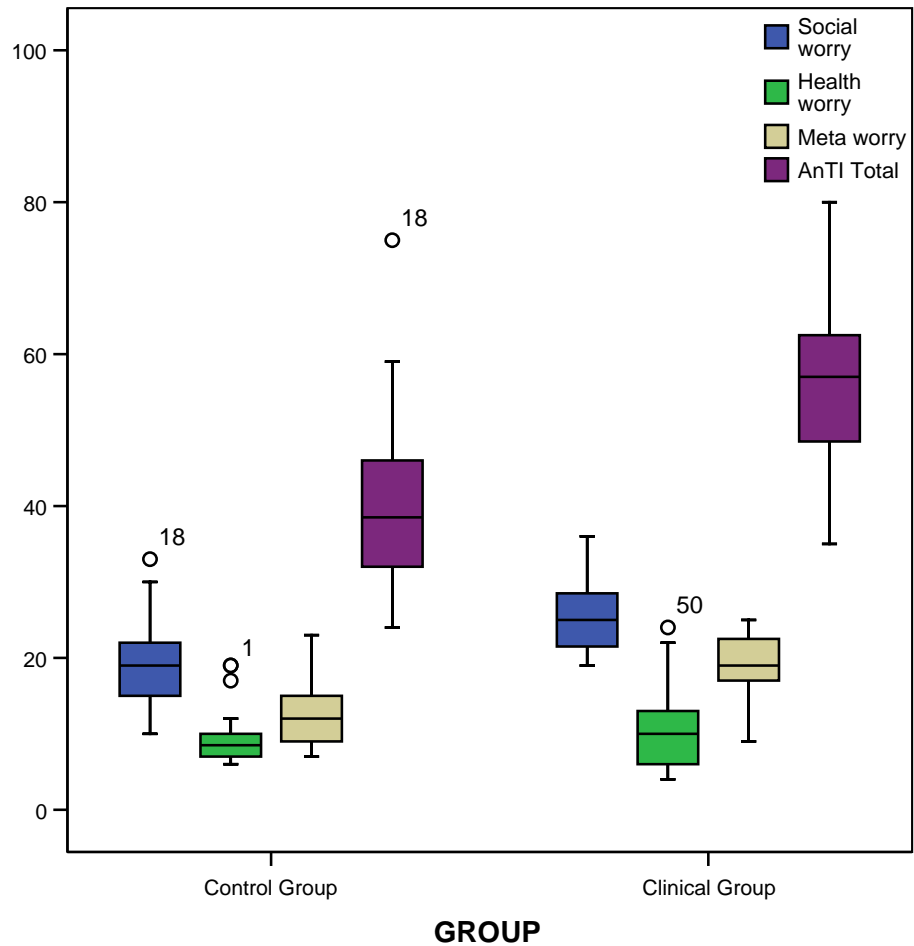
Thought Control Questionnaire: TCQ

Box plot displaying the mean scores for TCQ total, Distraction, Punishment, Re-appraisal, Worry & Social Control Subscales for both groups



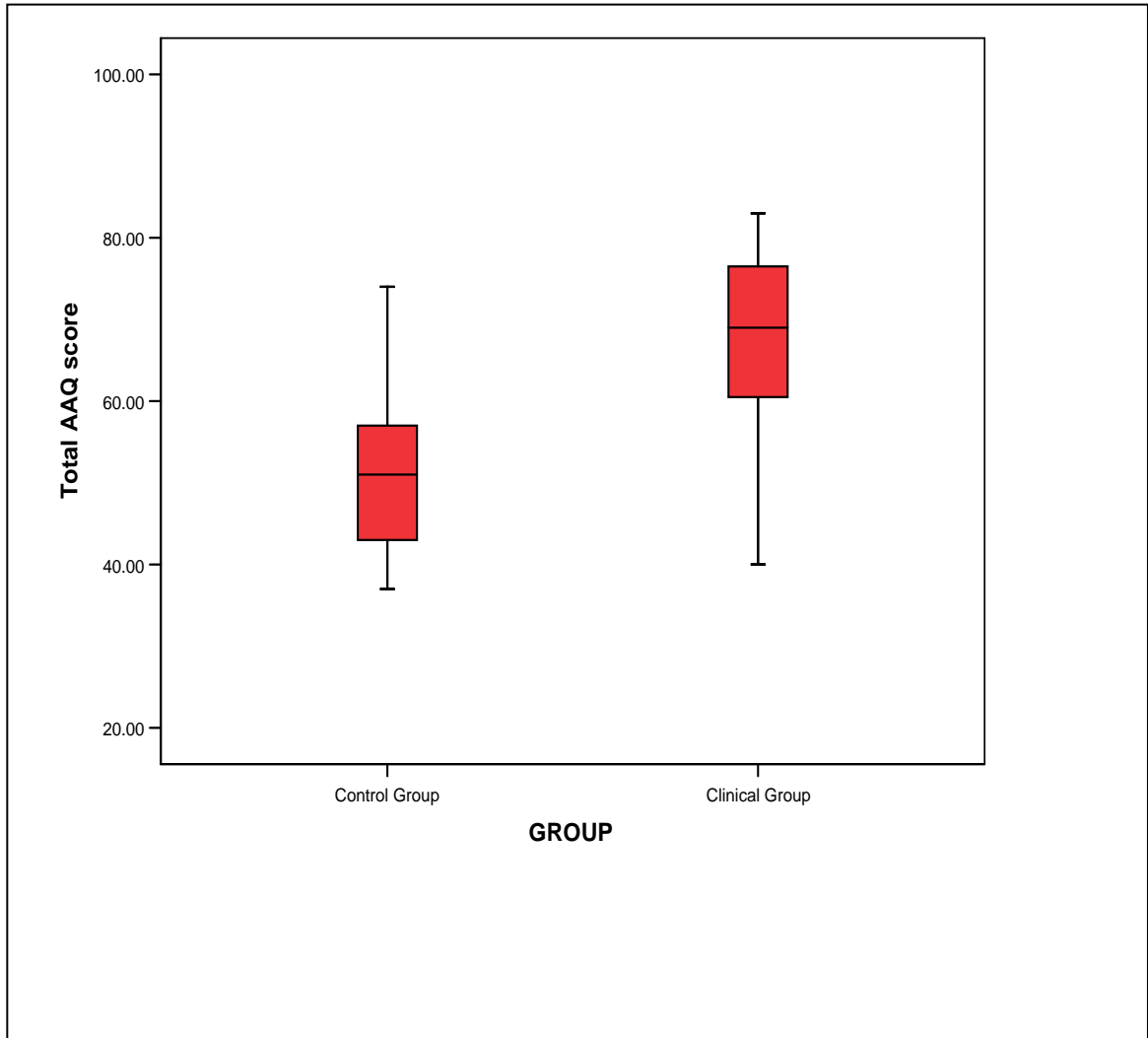
## Anxious Thoughts Inventory: AnTI

Box plot displaying the mean scores for AnTI total, Social Worry, Health Worry & Meta Worry subscales for both groups

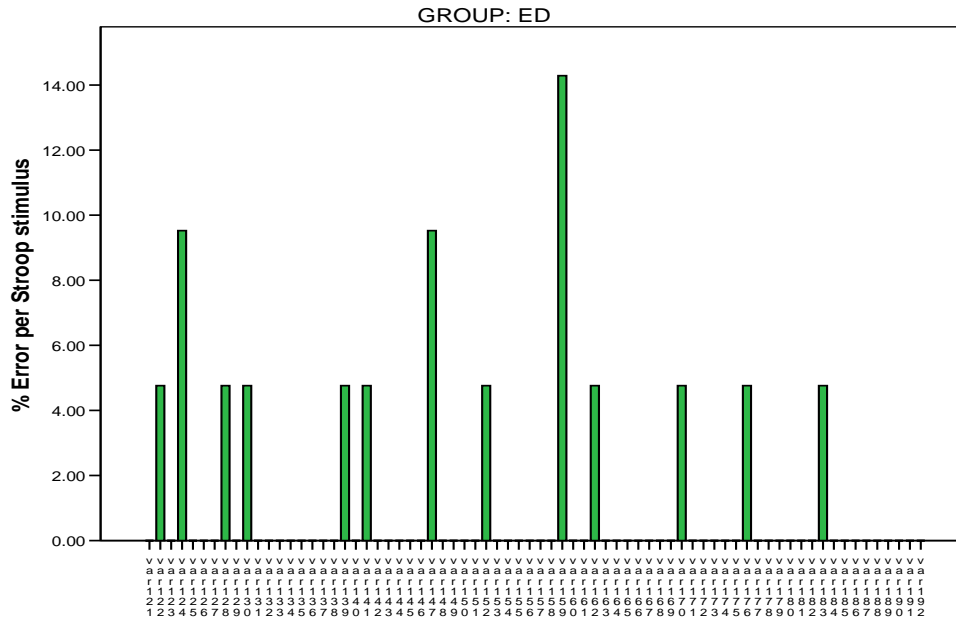


Acceptance & Action Questionnaire: AAQ

*Box plot displaying the mean scores for the AAQ total score for both groups*

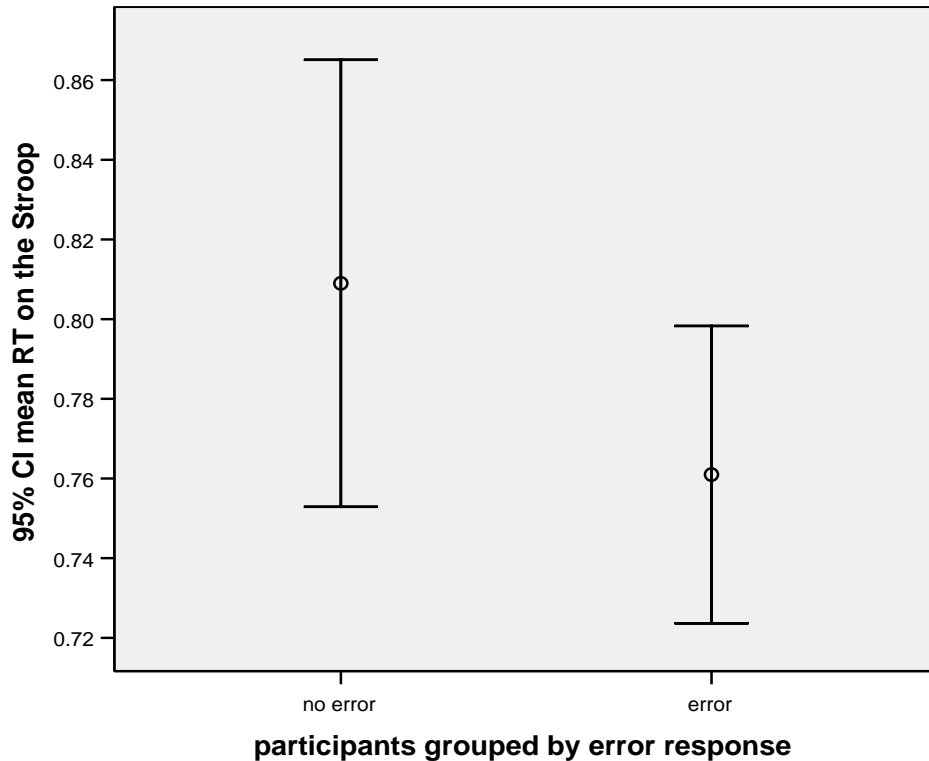






The percentage of error per Stroop stimulus was checked in the control group and no Stroop item exceeded 6% error. For the clinical group no Stroop item exceeded an error rate of 14%. The next step in the analysis or error on the Stroop was to check whether making an error on an item had a negative impact on the response times (i.e. resulted in longer latencies). The error bar below clearly indicates that, contrary to expectation, within 95% confidence limits participants who made errors were somewhat quicker in their response times. However, a t-test comparing the mean latencies for Stroop items where an error occurred with those items where no error occurred indicated that participants making errors were not significantly faster on Stroop item responses than those not making errors ( $t=1.45$ ,  $df = 53$ ,  $p = .15$ ).





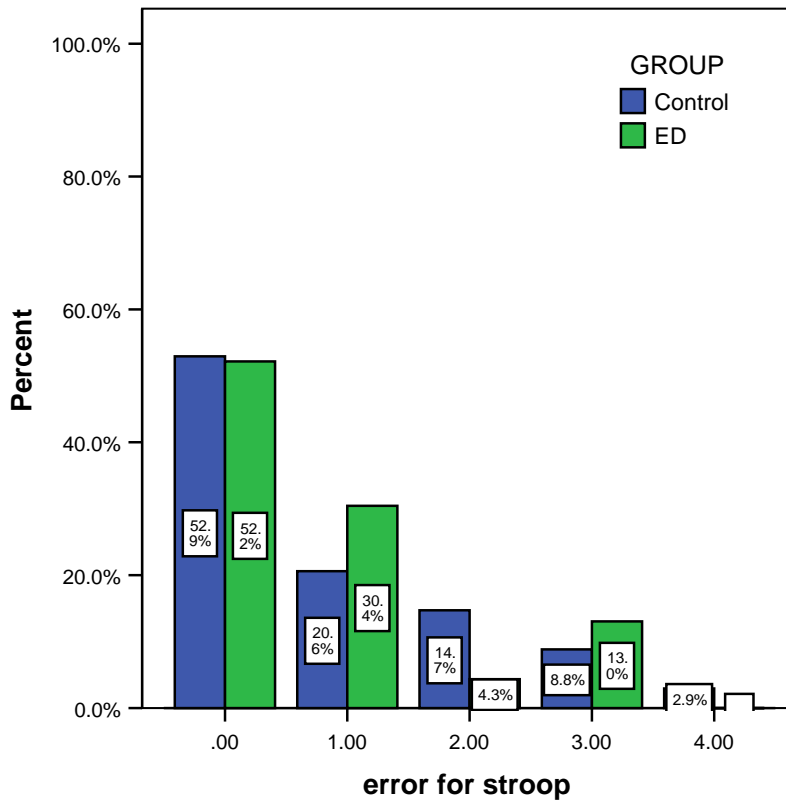
This exploration of the data indicated that no one Stroop item exceeded an error rate of 15% and that an error response on a Stroop item did not result in a slower reaction time. For this reason, there appeared to be no reason to exclude any Stroop item on the basis of error in subsequent analyses.

## 2) Frequency of errors per participant.

The frequency data for the number of errors per participant is shown in the table below. This indicates that 52.9% of cases made no errors in the control group and 52.2% of the clinical ED cases made no errors. A bar chart indicating the casewise error response rate for the control and clinical ED groups is also shown below. It would appear from this bar chart that the control group made less number of errors than the clinical ED group on individual Stroop items. The clinical ED group appeared to make more percentage of errors on particular Stroop items (i.e. variable 159; see box plots). However a chi square analysis performed on the two groups revealed no significant differences between the clinical ED group and the control group in terms of error on the Stroop ( $\chi^2$  Fishers Exact Test (df = 1, n=57) = 2.7, NS).

Table to show frequency data for error responses on the Stroop task for participants in the control and clinical ED group

GROUP	Valid	Number of errors per participant	Frequency	Percent	Valid Percent	Cumulative Percent
Control		.00	18	52.9	52.9	52.9
		1.00	7	20.6	20.6	73.5
		2.00	5	14.7	14.7	88.2
		3.00	3	8.8	8.8	97.1
		4.00	1	2.9	2.9	100.0
ED		.00	12	52.2	52.2	52.2
		1.00	7	30.4	30.4	82.6
		2.00	1	4.3	4.3	87.0
		3.00	3	13.0	13.0	100.0



Bar chart displaying the % error for the Stroop responses for participants in the control and clinical ED group.

*Analysis showing correlations between categories of Stroop stimuli*

GROUP			Body Mean	Food Mean	Self Esteem Mean	Body Neutral Mean	Food Neutral Mean	Self Esteem Neutral Mean	
Control Group (N=33)	Body Mean	Pearson Correlation	1	.872	.844	.887	.846	.840	
		Sig. (2-tailed)		.000	.000	.000	.000	.000	
	Food Mean	Pearson Correlation	.872	1	.862	.894	.908	.859	
		Sig. (2-tailed)	.000		.000	.000	.000	.000	
	Self Esteem Mean	Pearson Correlation	.844	.862	1	.797	.889	.838	
		Sig. (2-tailed)	.000	.000		.000	.000	.000	
	Body Neutral Mean	Pearson Correlation	.887	.894	.797	1	.855	.797	
		Sig. (2-tailed)	.000	.000	.000		.000	.000	
	Food Neutral Mean	Pearson Correlation	.846	.908	.889	.855	1	.837	
		Sig. (2-tailed)	.000	.000	.000	.000		.000	
	Self Esteem Neutral Mean	Pearson Correlation	.840	.859	.838	.797	.837	1	
		Sig. (2-tailed)	.000	.000	.000	.000	.000		
	Clinical Group (N=22)	Body Mean	Pearson Correlation	1	.827	.907	.865	.890	.805
			Sig. (2-tailed)		.000	.000	.000	.000	.000
Food Mean		Pearson Correlation	.827	1	.782	.838	.912	.910	
		Sig. (2-tailed)	.000		.000	.000	.000	.000	
SE Mean		Pearson Correlation	.907	.782	1	.844	.864	.825	
		Sig. (2-tailed)	.000	.000		.000	.000	.000	
Body Neutral Mean		Pearson Correlation	.865	.838	.844	1	.886	.846	
		Sig. (2-tailed)	.000	.000	.000		.000	.000	
Food Neutral Mean		Pearson Correlation	.890	.912	.864	.886	1	.844	
		Sig. (2-tailed)	.000	.000	.000	.000		.000	
Self Esteem Neutral Mean		Pearson Correlation	.805	.910	.825	.846	.844	1	
		Sig. (2-tailed)	.000	.000	.000	.000	.000		

Preparatory analysis was conducted to determine the strength of the correlations between the threat and neutral categories of words. This was carried out to investigate both the strength of the relationship between the categories and also as a check on the equivalent degree of difficulty between the stimuli categories. The results are shown in the table above and indicate the all categories of Stroop stimuli were significantly correlated.

### **Preparatory analysis in relation to the anagram solution task.**

If a participant produced a miss-spelt word, produced an incorrect word, made no response or produced one of the few alternative solutions to some of the anagrams, an error was recorded.

Analysis of the error responses on the anagram solution task was then performed to determine:

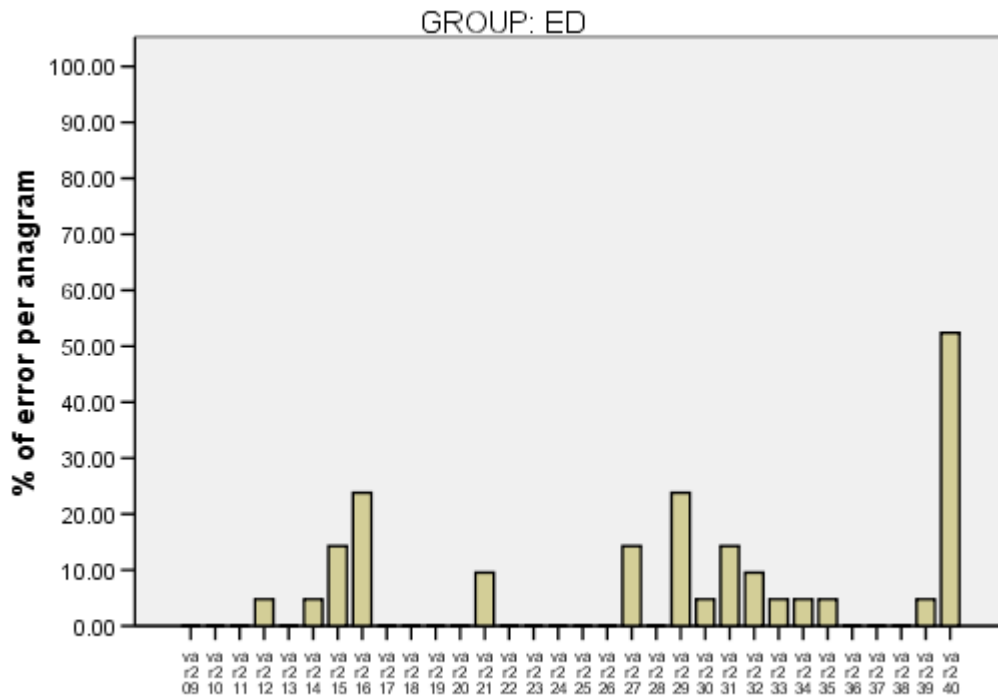
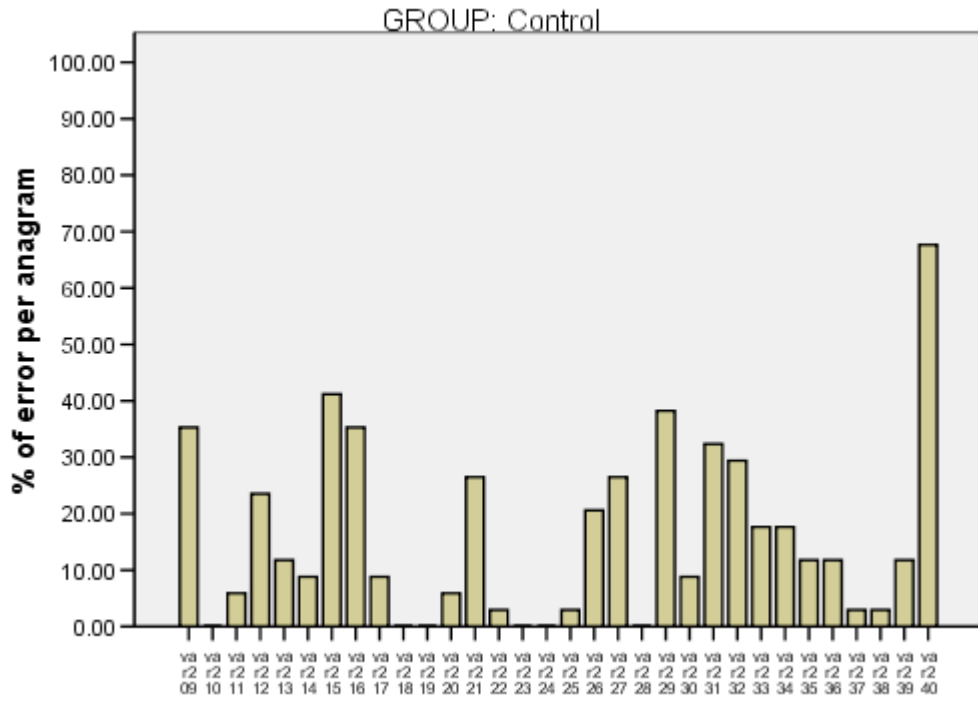
- 1) the error rate per individual anagram word
  - 2) the anagram error rate per participant
- 3) *Frequency of errors per anagram word*

The error rate data was examined to detect any individual anagram word with an unusually high error rate. The number of errors for each anagram were initially examined. These figures indicated that the clinical group made less errors overall (34.8% made no error) than the control group (5.9% made no error) on individual anagram items.

The bar charts displayed below graphically illustrate the percentage of errors per anagram that participants made in the clinical ED and control groups. It was clear from these charts that one anagram (v 120 'insult') produced a high degree of error in both groups (67.6% control group and 52.4% clinical ED group). This anagram was subsequently discarded and excluded from the analysis. It also appeared that the control group made a greater degree of errors than the clinical group and made them across a greater number of anagrams.

The percentage of error per anagram exceeded 30% for some words in the control group, however no individual anagram exceeded 30% in the clinical group. For this reason it was not feasible to exclude any anagram where the error was over 30% as the differences between the two groups was marked (i.e. on variable 209 see bar charts).

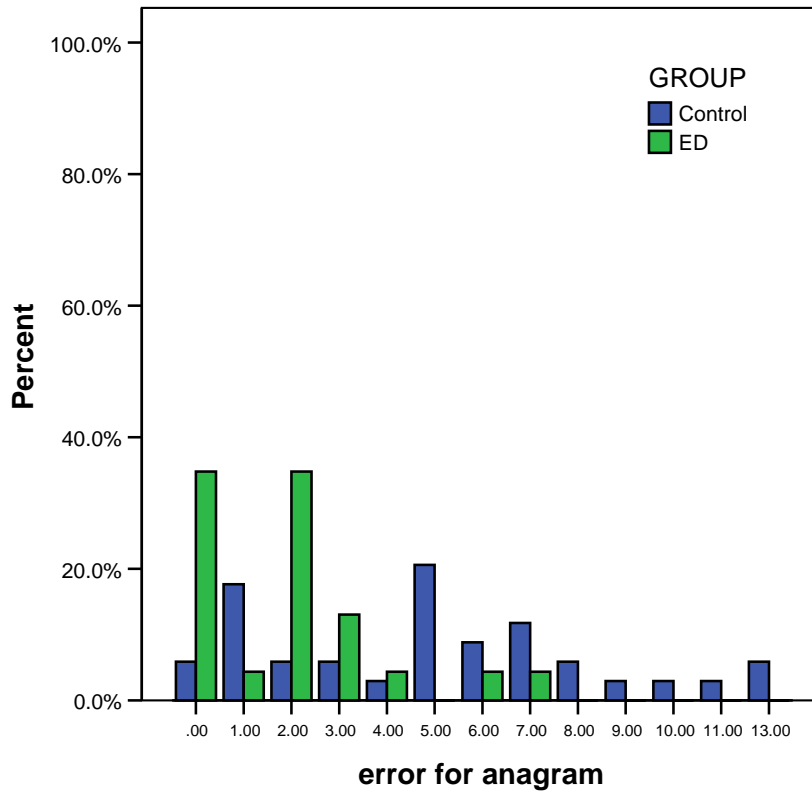
Bar graphs to show % error per anagram stimulus for each group



*Frequencies of anagram solution error per participant*

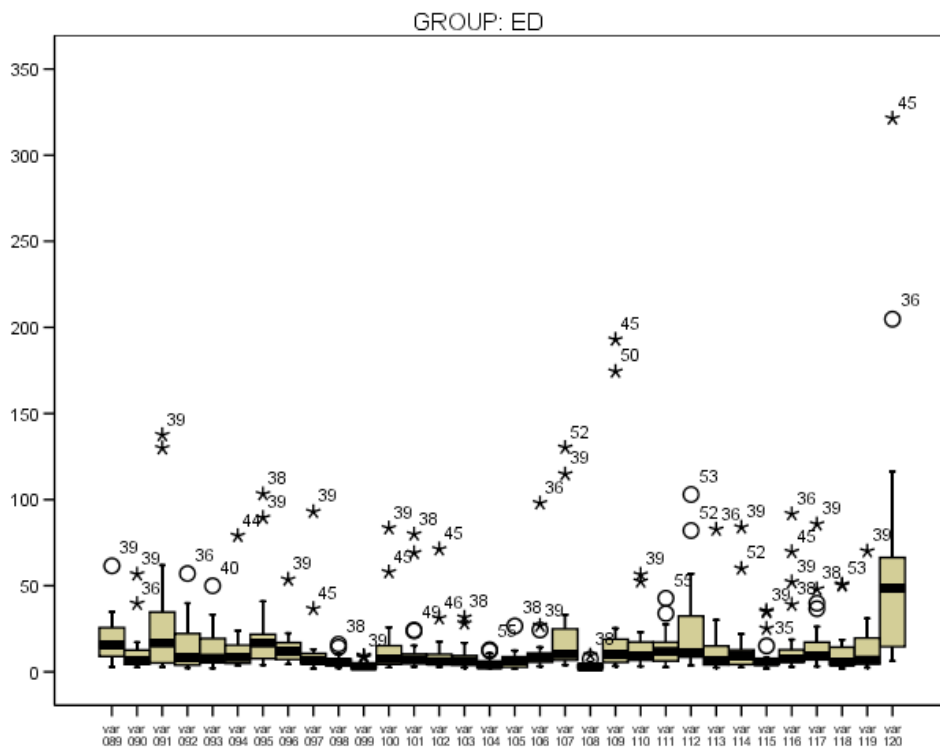
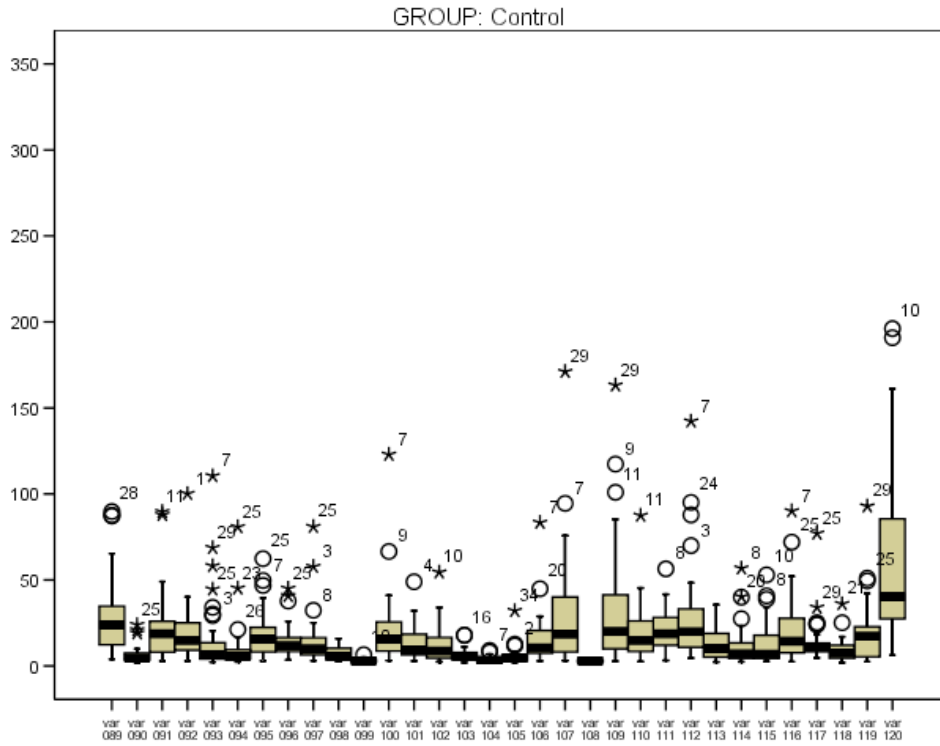
A bar chart indicating the casewise error response rate on the anagram task for the control and clinical ED groups is shown below. Higher error rates appeared to have been generated exclusively by controls.

*Bar chart displaying the overall error (%) for the anagram task for the comparison and clinical ED group.*



There was no indication to remove any case on the basis of an unreasonably high error rate. The previous research using the anagram solution task as a measure of cognitive avoidance gave no indication of how to manage error with the anagram data (Waller & Meyer 1997; Meyer et al 2005). Therefore it was decided to exclude all individual anagram errors case wise. Additionally any solution times in excess of 50 seconds or greater than 3 SDs from the 75<sup>th</sup> percentile were excluded (see box plots below).

Box plots showing individual anagram solution times for each group



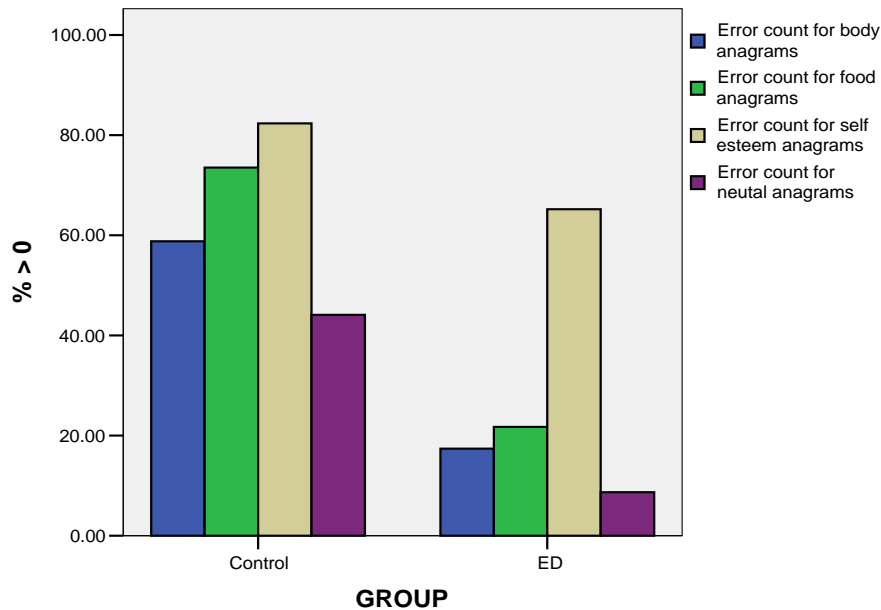


Non-parametric correlational analysis was performed to determine whether there were associations between making an error and anagram solution times, depending on the semantic category of word (i.e. food, body, self-esteem threat and neutral anagrams) between the control and clinical ED groups. The findings are displayed in the table below and show that within the control group, there was a significant association between the amount of error and the food anagram solution times.

GROUP				BODY_MED	FOOD_MED	SE_MED	NEUT_MED
Control (N=34)	Spearman's rho	error anagram	for Correlation Coefficient Sig. (2-tailed)	.070 .696	.459(**) .006	.283 .105	.176 .319
ED (N=23)	Spearman's rho	error anagram	for Correlation Coefficient Sig. (2-tailed)	.187 .393	.275 .204	.260 .230	.367 .085

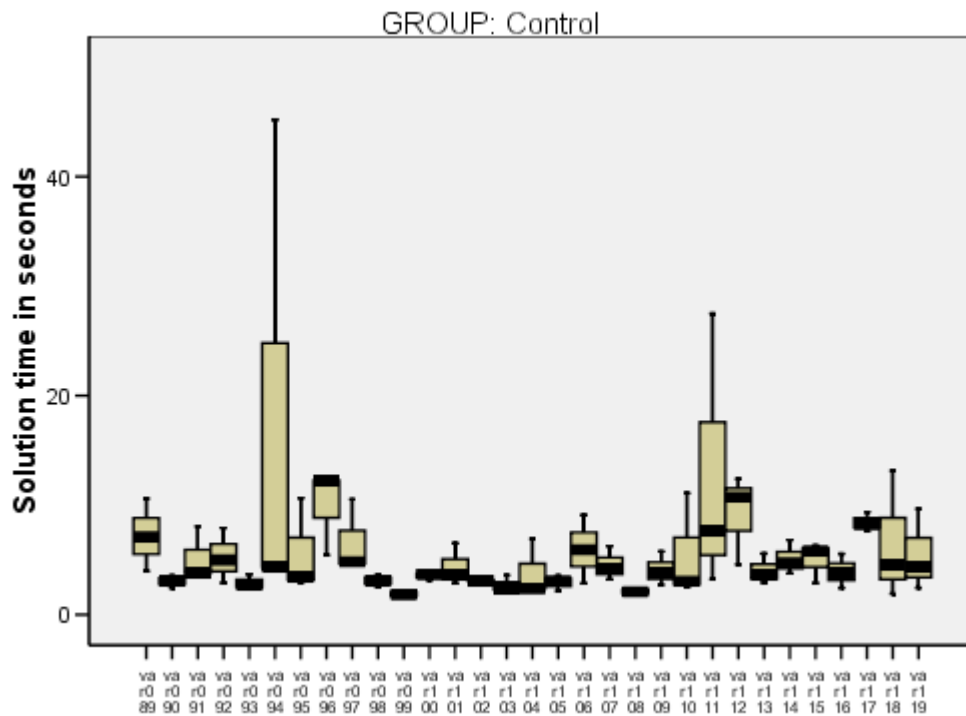
\*\* Correlation is significant at the 0.01 level (2-tailed).

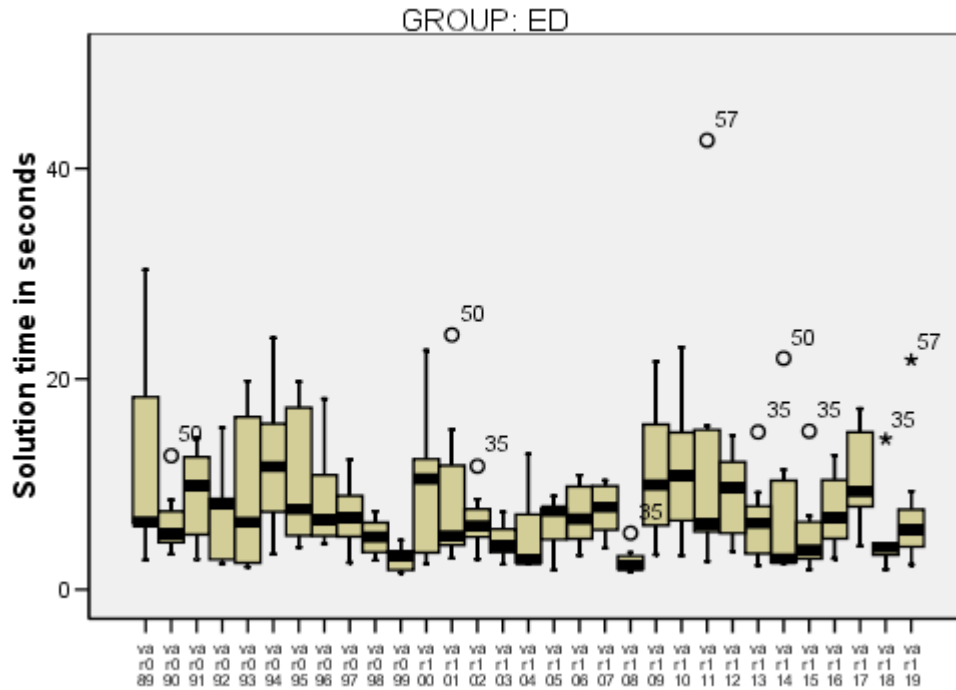
Analysis was performed to determine whether there were differences in the amount of error, depending on the semantic category of word (i.e. food, body, self-esteem and control) between the comparison and clinical ED groups. This indicated a significant difference between the number of errors and the semantic category of the word for the comparison group ( $\chi^2$  (3, n=34) = 30.5,  $p > .001$ ) and the clinical group ( $\chi^2$  (3, n=23) = 29.7,  $p > .001$ ). The bar chart displayed below illustrates the differences in the percentage error count on each semantic category of anagram for the ED clinical group and the comparison group. Generally, self esteem anagrams produced greater error.



Following removal of each individual respondent's error on an anagram, box plots were reproduced to check the distribution of anagram solution times for those anagrams correctly solved (see below). These box plots clearly indicate abnormalities in the distribution of the data and thus a more robust measure of central tendency, the median was decided upon to compute subsequent analyses for the anagram tasks. Non-parametric tests would be used due to abnormalities in the distribution of the data.

*Box plots displaying the distribution of anagram solution times for those stimuli correctly solved in the control and clinical groups*





*Analysis showing correlations between categories of anagram stimuli*

Preliminary analysis was conducted to determine the strength of the correlations between the threat and neutral anagram categories. This enabled inferences to be made with regard to the degree of difficulty between the anagram categories. The results, indicating significant correlations between each category are shown in the table below.

GROUP				Body Mean	Food Mean	Self esteem Mean
Control (N=33)	Spearman's rho	Body Mean	Correlation Coefficient	1.000	.874(**)	.818(**)
			Sig. (2-tailed)	.	.000	.000
		Food Mean	Correlation Coefficient	.874(**)	1.000	.834(**)
			Sig. (2-tailed)	.000	.	.000
		Self Esteem Mean	Correlation Coefficient	.818(**)	.834(**)	1.000
			Sig. (2-tailed)	.000	.000	.
		Body Neutral Mean	Correlation Coefficient	.904(**)	.864(**)	.762(**)
			Sig. (2-tailed)	.000	.000	.000
Food Neutral Mean	Correlation Coefficient	.861(**)	.860(**)	.859(**)		
	Sig. (2-tailed)	.000	.000	.000		
Self Esteem Neutral Mean	Correlation Coefficient	.800(**)	.837(**)	.830(**)		
	Sig. (2-tailed)	.000	.000	.000		
ED (N=22)	Spearman's rho	Body Mean	Correlation Coefficient	1.000	.779(**)	.938(**)
			Sig. (2-tailed)	.	.000	.000
		Food Mean	Correlation Coefficient	.779(**)	1.000	.694(**)
			Sig. (2-tailed)	.000	.	.000
		SE Mean	Correlation Coefficient	.938(**)	.694(**)	1.000
			Sig. (2-tailed)	.000	.000	.
		Body Neutral Mean	Correlation Coefficient	.836(**)	.802(**)	.817(**)
			Sig. (2-tailed)	.000	.000	.000
Food Neutral Mean	Correlation Coefficient	.818(**)	.892(**)	.768(**)		
	Sig. (2-tailed)	.000	.000	.000		
Self Esteem Neutral Mean	Correlation Coefficient	.774(**)	.841(**)	.783(**)		
	Sig. (2-tailed)	.000	.000	.000		

**Journal Ready Copy of Research**

**Cognitive avoidance in eating disorders**

**for submission to the International Journal  
of Eating Disorders**

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Cognitive avoidance in eating disorders

## ABSTRACT

**Objective:** To examine the relationship between eating disorders and cognitive avoidance using a strategic processing task.

**Method:** 23 women with eating disorders and 34 controls completed a strategic processing anagram solution task of disorder relevant, threat and neutral anagrams. All participants completed measures of eating disorder pathology and cognitive coping style.

**Results:** There was some indication that women with eating disorders showed cognitive avoidance of food and self esteem related threats relative to neutral anagrams. Differences between the clinical and control groups were inconclusive.

**Conclusion:** The findings are discussed in the context of the previous research. It is proposed that future research should use paradigms which differentiate between attentional bias and cognitive avoidance.

**Keywords:** eating disorders, cognitive avoidance, disorder relevant, self esteem threats, cognitive processing.

## *Introduction*

Research has suggested that people demonstrating eating pathology process disorder relevant information in two key ways. First, there is an automatic process involving attentional bias to the information (i.e. stimuli relating to body shape, food and weight). This has been found relatively consistently in eating disorder patients (1-6). Secondly, there is some evidence that patients with eating disorders might also attempt to divert their attention away from this information, particularly if it is construed as threatening (i.e. a threat to self esteem such as 'failure'; 7-9). This is framed as a defensive process of cognitive avoidance, as patients are unable to sustain their attention on the threat due to the negative thoughts and affect that may arise (10-13). However, there is very little evidence demonstrating the presence of cognitive avoidance in eating disordered patients.

Theoretical models such as the "escape from self awareness" conceptualisation of binge eating (14-15) and the "blocking" model (16-17) offer accounts of eating disorder psychopathology as an avoidant mechanism. Both models suggest that eating behaviours are motivated attempts to reduce short term awareness of difficult emotions and cognitions that the individual finds intolerable. In those with binge eating, through seeking to escape a negative self focus the individual may narrow the focus of their attention to very present and immediate behaviour such as eating (14-15). Forms of avoidant coping might also serve to suppress experience such as thought suppression (18-20), dissociation (21), and processes such as worry and rumination (22-26). Processes of cognitive avoidance could be reasonably encompassed by the ACT concept of experiential avoidance (27-28) which comprises forms of avoidance such as attempts to escape stressful experiences (i.e. avoidant coping), attempts to become separate from aversive events and accompanying emotions (e.g. detached coping), or to inhibit the expression of emotions (e.g. emotional suppression). Experiential avoidance, together with ineffective cognitive-behavioural emotional control strategies (e.g. dietary restriction in ED) have been implicated in the aetiology and maintenance of eating pathology (29-30).



The research evidence exploring cognitive avoidance to date has used various cognitive processing paradigms with non-clinical populations displaying some eating pathology (1; 9-10). These studies have found evidence of cognitive avoidance in women with bulimic attitudes. A key study employed an anagram solution task to measure cognitive avoidance within a clinical eating disordered population (11). As a strategic processing task, this involved active engagement with threatening stimulus words (e.g. single-word anagrams for food such as 'cake'), self esteem threat (e.g. 'fail') and neutral words which the participant was required to solve under timed conditions. Longer solution times for threat words in comparison to neutral words were indicative of the individual seeking to avoid engagement with the threat word.

The study by Meyer et al (11) found evidence that bulimic individuals took longer to process the self esteem threat anagrams than controls. There were no differences in anagram solution time observed for the food related words. This study lends some support to a proposition within the "escape" model 14 that for bulimic individuals, ego or self esteem threats might be more relevant in the development of eating psychopathology than the more disorder specific threats related to symptoms. To date, no conclusive evidence has been found in relation to cognitive avoidance in a restrictive anorexic group. One might expect this to function differently, as those with restrictive eating do not use binge-eating to shift the focus of their attention.

It is clear that there is little empirical evidence available investigating cognitive avoidance with a clinical eating disorder sample. In general, the evidence base for the presence of cognitive avoidance in eating disorders is at an early stage. There is scope for refinement and development of the paradigms. The process of cognitive avoidance should be explored within eating disorders other than bulimia to examine if it is a process which can be found across eating pathology. There are some limitations to anagram paradigm as it has been used, such as matching anagram words appropriately for difficulty, for length of word and for emotional valence. The previous research has also been limited in the stimuli it has focused upon, employing only two semantic classes of stimuli (e.g. food and threat).

The overall goal of the present research was to establish whether patients with eating disorders show cognitive avoidance for eating, shape/weight and self esteem threat stimuli and if so whether this process is specific to patients with eating disorders. This study attempted to explore the role of cognitive avoidance in eating disordered behaviour by targeting a clinical population across eating disorder diagnoses. By using a computerised modification of the anagram solution task used in previous research, the current study aimed to provide support for but also advance this paradigm by addressing some of the limitations. This study also attempted to explore experiential avoidance in eating disorders, as this has close links with cognitive avoidance. The study was approved by the local research ethics committee. It was hypothesised that:

- 1) cognitive avoidance for food, body and self esteem threat stimuli will (a) be present in patients with and eating disorder and (b) be stronger in patients with eating disorders than controls
- 2) that eating disordered behaviour (i.e. bulimic or anorexic behaviour) will have a moderating effect on cognitive avoidance
- 3) that there will be a relationship between experiential avoidance and cognitive avoidance in eating disorder patients.

## Method

*Participants:* The clinical participant group were recruited from a community eating disorders service (n=23). They were all female, aged over 16 and had a body mass index (BMI) of not less than 13 and not greater than 27. To test hypothesis 2, the clinical group were split by diagnosis together with their scores on the Eating Disorders Inventory-3 (EDI-3). This resulted in two groups of patients; those who used binge-purge behaviours (n=15) and those who were restrictive (n=8).

The control group were recruited from a university sample. All were female, aged over 16, were within a normal weight range (BMI 20-25), were not currently dieting or displaying problematic eating behaviour outside of normal limits (as measured by 3 subscales of the EDI-3). All participants were required to have computer keyboard and mouse skills. Those participants with dyslexia were excluded from the study.

### Materials:

*Stimuli:* Threat stimuli were drawn from a pool of those previously reported in the cognitive avoidance research and from words used in prior studies of attentional bias. Neutral anagrams were generated for this study from 3 semantic categories (i.e. animals, household and office objects). Criteria were employed to match words for length and frequency of use in the English language, consistent with previous research. Participants were asked to complete 32 single-word anagrams consisting of words up to a maximum of 6 letters. Anagrams consisted of food, body, self esteem threat and neutral words, with 8 words in each category. Anagrams were randomised across the semantic categories and presented to all participants in the same order.

*Apparatus:* The stimuli were presented on a 15" Sony Vaio FX101 laptop. A software programme designed for the study presented the stimuli and recorded response latencies. Participants received task instructions on the screen prior to beginning the task. These were also written out for them. They were instructed to work as quickly as possible, to try not to make any mistakes and that they would be timed for the task. Participants completed a short practise trial prior to beginning the task.

Measures: All participants completed all measures.

*The Eating Disorder Inventory 3 RF (EDI-3; Garner, 2004 31):* The EDI-3 is a widely utilised self-report measure of eating disorder symptoms. The three primary subscales of the EDI-3 were used; the Drive for Thinness (DT), Bulimia (B) and Body Dissatisfaction (BD) scales. This consists of 25 items scored on a 0-4 scale. The EDI-3 has been shown to have good internal consistency ( $r=.90-.97$ ), content and criterion-based and construct validity ( $\alpha=.80$ ) with good test-retest reliability ( $r=.98$ ). It has norms available for anorexia (Restricting and Binge-Eating/Purging type), bulimia and eating disorder NOS individuals. Mean raw scores are available for non-clinical samples.

*Acceptance & Action Questionnaire (AAQ; Hayes et al, 2004 32):* The AAQ is a measure of experiential avoidance. The 16 item version was used, which is undergoing validation. The psychometric properties of this scale have been established in clinical and non-clinical samples. The AAQ has reasonable internal consistency; Cronbach's  $\alpha$  of .70 and on comparison with the White Bear Suppression Inventory (a measure of avoidant coping 33) showed convergent validity of  $r =0.44-0.50$ . Each item is scored from 1 (never true) to 7 (always true) with half of the items reversed scored. For the purposes of this study, higher scores indicated greater experiential avoidance.

*Thought Control Questionnaire (TCQ; Wells & Davies, 1994 34):* The TCQ is a well utilised and researched measure of thought control strategies believed to have a link to psychopathology. It consists of 30 items that can be summed to give a total score and comprises 5 subscales of Distraction, Punishment, Re-appraisal, Social control and Worry. The subscales have been shown to have moderate to strong internal consistency (Cronbach  $\alpha$  of .64 - .79 for the subscales) and have good test re-test reliability ( $r=.68-.83$ ). The subscales of interest were Punishment and Worry as it has been indicated that a tendency to use these strategies to control unwanted thoughts has significant associations with emotional disorder and psychological disturbance 35.

*Anxious Thoughts Inventory (AnTI; Wells, 1994 36):* The AnTI has been widely used in clinical research and is a measure of the content and process of anxious thoughts. It comprises 22 items which can be summed to give a total score that comprises 3 subscales; Social worry, Health worry

and Meta-worry. The subscales have good internal consistency (Chronbach  $\alpha$  of 0.84, 0.81 and 0.75 respectively). This measure is particularly useful in assessing the content of pathological worry and difficulties in the regulation of thought.

Statistical analyses:

Data analysis was based on anagram solution time (in seconds) for correct responses. One anagram produced a high degree of error in both groups (67.6% for controls and 52.4% for the clinical group) and was automatically excluded from the analysis. There was a significant difference between the amount of error for the control group (5.9% made no error) and the clinical ED group (34.8% made no error) on individual anagram items ( $z=3.51, p = .001$ ). Due to the variation in the percentage of error per anagram between the groups, it was not appropriate to exclude any individual anagram on the basis of a percentage error rate. As it was unclear how to manage error within the anagram data based on previous research 10-11, all individual anagram errors were excluded case wise. Additionally any solution times in excess of 50 seconds or greater than 3 standard deviations from the 75<sup>th</sup> percentile were excluded. Due to abnormalities in the distribution of the data, the median statistic was used in the analysis of the anagram task.

To answer the key experimental hypotheses relating to cognitive avoidance, a series of planned comparisons within and between groups were conducted and planned to be tested 1-tailed. To investigate the hypothesis relating to experiential avoidance and cognitive avoidance, correlational analyses were used.

## Results

### Demographic and group characteristics:

The demographic and group characteristics are shown in Table 1. As expected there were significant group differences between BMI, the EDI-3, AnTI, TCQ and AAQ.

**Table 1: Age, BMI, eating disorder psychopathology, anxious thoughts, thought control strategies and experiential avoidance scores (and SD) by group**

	Clinical ED Group N=23	Control group N=34	Group differences
Mean age	28.60 (8.60)	22.15 (4.73)	$t=3.65$ (53) $p = .001$
Mean BMI	18.00 (2.70)	21.66 (2.44)	$t=5.44$ (53), $p = .001$
EDI-3 DT	24.00 (5.60)	4.60 (5.03)	$z=13.60$ (53), $p=.001$
EDI-3 B	13.40 (10.50)	2.30 (3.33)	$z=5.70$ , (53), $p=.001$
EDI-3 BD	33.60 (7.73)	12.40 (8.70)	$z=9.40$ (53), $p=.001$
TCQ Punishment	13.52 (4.03)	9.90 (2.50)	$z=3.60$ (53), $p=.001$
TCQ Worry	13.00 (3.10)	9.80 (3.04)	$z=4.00$ (53), $p=.001$
AnTI Total	56.00 (12.00)	40.5 (11.30)	$z=4.30$ (53), $p=.001$
AAQ Total	67.1 (12.0)	51.2 (9.4)	$z=5.90$ (53), $p=.001$

*Hypothesis 1:* cognitive avoidance for food, body and self esteem threat stimuli will (a) be present in patients with and eating disorder in comparison to neutral stimuli and (b) be stronger in patients with eating disorders than controls. Due to abnormalities in the distribution of the data, non-parametric Mann Whitney U tests were used in the analysis. The descriptive statistics for the anagram solution task are shown in Table 2.

Within the eating disorder group there was a significant difference between participants mean anagram solution times on food anagrams ( $z=2.20$ ,  $p=.01$ ; Cohen's  $d=.40$ ) and self esteem threat anagrams ( $z=2.70$ ,  $p=.01$ ; Cohen's  $d=.40$ ) in comparison with the neutral anagrams. There were no significant differences for solution times between body anagrams and neutral anagrams ( $z=1.20$ ,  $p=.10$ ; Cohen's  $d=.16$ ). Therefore, experimental hypothesis 1 could only be partially accepted because the effect size for the body anagram comparison was very small. It was concluded that eating disorder participants demonstrated cognitive avoidance for food and self esteem threat anagrams in comparison to neutral anagrams.

**Table 2: Anagram solution times (and SDs) in seconds for eating disorder and control groups**

	Clinical ED Group N=22	Binge-purge subgroup N=14	Restricting subgroup N=8	Control group N=34
Body anagram	8.30 (5.1)	8.15 (5.00)	8.50 (5.40)	9.30 (5.00)
Food anagram	8.80 (4.2)	9.06 (4.00)	8.26 (5.00)	9.80 (6.00)
Self esteem anagram	9.00 (4.3)	8.47 (4.00)	9.86 (5.20)	11.60 (5.00)
Neutral anagram	7.40 (5.1)	6.53 (3.00)	9.36 (7.60)	6.50 (3.40)

On inspection of the mean anagram solution times, it appeared contrary to prediction that the control group produced longer solution times than the clinical group. This had the potential to obscure the findings between the groups and so was further explored in a post hoc investigation, to be discussed.

*Hypothesis 1b:* Given the above, to further investigate if the control group were significantly different from the clinical group the Mann Whitney U comparisons were performed 2 tailed. There

were no significant differences on anagram solution time between the groups for the body anagrams ( $z=-1.10$ ,  $p=.30$ ; Cohen's  $d=-.40$ ) or food anagrams ( $z=-3.00$ ,  $p=.80$ ; Cohen's  $d=-.11$ ). Negative effect sizes denote that the control group performed more slowly on these anagrams, contrary to prediction. Indeed this result was significant for the self esteem threat anagrams ( $z=-2.20$ ,  $p=.01$ ; Cohen's  $d=-.50$ ), against the hypothesis. For this reason the experimental hypothesis that cognitive avoidance would be stronger in the clinical group than the control group was rejected.

#### *The effect of eating disordered behaviour on cognitive avoidance:*

The clinical group was split into two by eating disordered behaviour, i.e. those using binge-purge behaviours ( $n=14$ ) and those who restrict ( $n=8$ ). This was based upon their diagnosis and their scores on the EDI-3 subscales.

*Hypothesis 2:* eating disordered behaviour (i.e. bulimic or anorexic behaviour) will have a moderating effect on cognitive avoidance.

A Mann Whitney U test revealed no significant difference between the eating disordered behaviour groups for anagram solution times for body ( $z=-.13$ ,  $p=.90$ ; Cohen's  $d=-.06$ ), food ( $z=.81$ ,  $p=.40$ ; Cohen's  $d=.17$ ) or self esteem threats ( $z=-.53$ ,  $p=.60$ ; Cohen's  $d=-.36$ ). Negative effect sizes denote that the restricting group processed these anagrams more slowly. The effect sizes were small and so the hypothesis that type of eating disordered behaviour would have a moderating effect of anagram solution time was rejected.

#### *Experiential avoidance:*

*Hypothesis 3:* theoretically experiential avoidance appears to subsume cognitive avoidance, therefore it was expected that there would be a relationship between the participants scores on the AAQ and performance on the anagram task.

Unexpectedly, correlational analysis did not reveal any relationships between scores on the AAQ and solution times for the threat anagrams. The findings are displayed in Table 3. No relationships were found for either group.



**Table 3: Correlations between anagram solution times and experiential avoidance for eating disorder and control groups**

	Clinical ED Group (N=22)		Control Group (N=33)	
	Spearman's rho Correlation	p value	Spearman's rho Correlation	p value
AAQ with Body Anagram Median	.24	.30	.10	.60
AAQ with Food Anagram Median	.05	.80	-.23	.20
AAQ with Self Esteem Anagram Median	.27	.23	-.05	.80

Post hoc analysis relating to the control group

Post hoc investigations of the control group were performed as it emerged that they appeared to produce longer anagram solution times than the clinical group (i.e. indicating greater cognitive avoidance). Within subjects post hoc comparisons indicated that participants in the control group produced significantly longer anagram solution times for food words ( $z=4.10$ ,  $p=.001$ , 2-tailed), body words ( $z=4.10$ ,  $p=.001$ , 2-tailed) and self esteem threat anagrams ( $z=6.50$ ,  $p=.001$ , 2-tailed) than neutral anagrams. These effects were much greater than for the clinical group (Cohen's  $d$  of .72, .70 and 1.22 respectively). Prior investigations indicated that the control group produced significantly more errors than the clinical group therefore this suggests there may have been factors specific to the control group that may have obscured the findings on the anagram solution task.

## Conclusions

Support was found for the presence of cognitive avoidance within the eating disorder group for food and self esteem threats. However, these findings were compromised by the lack of a significant effect between the clinical and comparison groups. Post hoc tests indicated that cognitive avoidance was not specific to the eating disorder group, as the control group displayed longer anagram solution times for the threat anagrams than the clinical group. This was unexpected and contradicts the previous findings (11). However, parallels can be drawn between the findings of existing research and the present study. In Meyer et al's study (11), although bulimic participants took longer to solve the 'ego-threat' words (i.e. those related to self esteem), no differences were found for the food anagrams. Post hoc tests revealed that the clinical group solved food anagrams faster than the control group, particularly the restrictive participants. Restrictive participants also solved the ego-threat anagrams in similar times to the control group (11). Within non-clinical samples there is evidence to suggest that those with a lower BMI solve threat anagrams more quickly (10). These prior findings are significant for the present study as having a mixed clinical group for the main hypotheses may have obscured the important effects of eating disordered behaviour. Further research is warranted with larger samples to determine the effect of disorder specific behaviour on cognitive avoidance.

Within the previous research, faster anagram solution times have been suggested to represent processes of attentional bias in operation within the task (11). It has been highlighted that attentional bias and cognitive avoidance do not occur independently of each other during information processing (37-38). Therefore it is possible that attentional biases to the disorder relevant and self esteem threat stimuli may account for the faster solution times in the clinical group.

It is possible that the control group did display greater degrees of cognitive avoidance than the clinical group. This would indicate that cognitive avoidance is a generic process, not specific to psychopathology. This is a reasonable suggestion which would benefit from further exploration in the research. However, the amount of error generated by the control group may help to explain

these findings. It is possible that the control group found the anagrams more complex than the clinical group, thus they made more errors and took longer to solve them. There was some variation between the groups that may go some way to explaining the task specific differences in error. For example the control group were younger than the clinical group. This may be important as there has been some indication that age may affect cognitive biases (39). Although there were no significant differences between the groups, level of English grammar and comprehension may also have had an effect, as there was a trend towards more participants with English as a second language in the control group. This may have inflated the error rate and had an impact on anagram solution time. Future research should be mindful of these factors.

Despite indications that experiential avoidance was likely to be a key feature of the eating disorder group in this study, it was of note that this did not appear to be an explanatory variable for cognitive avoidance. This is contrary to expectation, as it is likely that the construct of experiential avoidance (27-28) would encompass avoidant cognitive processes. This may be both a feature of the way that experiential avoidance is constructed within the AAQ and a result of the limitations of this study. The AAQ questionnaire requires further validation. However the existing theoretical and clinical evidence would suggest that experiential avoidance plays an important role in the development and maintenance of ED (29-30).

This study had a number of strengths. Notably, only one other study has explored cognitive avoidance in a clinical eating disorder sample using the anagram solution paradigm. This study attempted to add more weight to the literature in support of the relevance of cognitive avoidance to an eating disordered population. It also attempted to advance the paradigm by attempting to improve matching procedures for stimulus words and extending the disorder relevant stimuli to include body words. Presenting the task in a computerised way was also beneficial as it minimised demand characteristics and experimenter effects. It also allowed for more accurate recording of response times than via stopwatch. This study attempted to explore cognitive avoidance by eating disordered behaviour, as opposed to diagnosis. This is in line with a transdiagnostic (40), more functional view of eating disorders. However the numbers in each group may have been too low to

detect any differences. This study is also one of the first to measure experiential avoidance in a clinical eating disorder group.

The study had a number of limitations, including the lack of a pilot study to obtain normative solution times for the anagram task. As the target words were different to that used in the prior research, direct comparison was not possible. Therefore establishing norms with which to compare clinical samples and ensure anagrams are of equivalent difficulty is crucial for future research. It is possible that the stimuli used were not as relevant to the current concerns of eating disordered individuals as hoped. Ways to improve this would be asking a group of eating disorder participants to rate a pool of target words in terms of the degree of threat. This may improve the ecological validity of the target words used. Finally, the anagram solution task may not adequately distinguish between biases towards threat and cognitive avoidance of threat. Developing paradigms that tease out differences between vigilance to threat (i.e. attentional bias) and avoidance of threat would be worthwhile, although this is with recognition that the processes may be interdependent.

Given the evidence to support cognitive avoidance within the eating disorder group in this and prior research, it is reasonable to conclude that this process may have relevance for individuals with eating disorders. Theoretical accounts conceptualise eating disordered behaviours themselves as motivated attempts to regulate affect through the avoidance or “escape” they provide. There is much evidence to suggest that efforts to regulate emotion by attempting to avoid, control and suppress experience may ultimately exacerbate and perpetuate distress (27-28; 41-44). As it seems likely that avoidance would perpetuate the symptoms associated with eating disorders, particular clinical techniques to address this may be warranted. These may already be encompassed within CBT (i.e. exposure and response prevention) but it may be that avoidant processes may be more usefully addressed by using clinical approaches such as ACT (27-28). This approach would seem to be beneficial as it highlights the long term effects of experiential avoidance in maintaining psychopathology. Within treatment, ACT emphasises the acceptance of previously avoided negative thoughts and emotions as a route to recovery. This approach has been usefully modified for eating disorders (30) and therapeutic outcome studies measuring

changes in avoidant style of coping would provide support for the use of this approach. This is a challenge for clinical research.

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