

UNIVERSITY OF SOUTHAMPTON

FACULTY OF MEDICINE, HEALTH AND LIFE SCIENCES

School of Psychology

Investigating the Role of Implicit Self-Esteem in Bulimia Nervosa

by

Elaine S. Cockerham

(volume 1 of 1)

This thesis is submitted in partial fulfilment for the degree of

Doctor in Clinical Psychology

June 2006

Word Count: 19,074

Thesis Abstract

Current cognitive models of Bulimia Nervosa (BN) emphasize the importance of global negative self-evaluations in the development and maintenance of the disorder. However, there are inconsistencies in the findings of research that has examined the relationship between levels of self-esteem and BN. Although investigations are being made into, and tools designed to measure *implicit* self-esteem, to date in the eating disorder literature self-esteem has only been measured using self-report questionnaires and thus may only allow access to *explicit* self-esteem. The literature review examines the relevance of self-esteem within cognitive behavioural theories of BN and reviews the literature that has attempted to investigate relationships between levels of self-esteem and BN. Research investigating implicit self-esteem is then reviewed and the value of extending this research into the area of eating disorders considered. The empirical research then primarily investigates whether there are differences in implicit biases of self between individuals with eating disorders compared to healthy controls, using the Implicit Associations Test (IAT: Greenwald, McGhee, & Schwartz, 1998; Greenwald & Farnham, 2000). Differences between the groups in explicit self-esteem are also investigated. The results show a significant difference between the groups on both the explicit and implicit measures of self-esteem, but show that individuals with eating disorders actually have higher levels of implicit self-esteem. The results are discussed in relation to other research that has found that a positive implicit self-esteem bias exists in clinical populations and that considers the discrepancies between implicit and explicit measures.

TABLE OF CONTENTS

List of tables	7
List of figures	8
 Acknowledgements	 9
 Literature Review:	 10
<i>The role of self-esteem in bulimia nervosa and the value of extending investigations into implicit self-esteem.</i>	
Abstract	11
Introduction	12
Description of Bulimia Nervosa	16
Prevalence of Bulimia Nervosa	17
Theory and Treatment of Bulimia Nervosa	17
The Role of Self-Esteem in the Development and Maintenance of Bulimia Nervosa	23
The Relationship between Self-Esteem and Bulimia Nervosa	26
Conceptualisation and Measurement of Self-Esteem in Bulimia Nervosa	30
Limitations of Self-Report Measures	31
Implicit Measures	33
The Development of Implicit Self-Esteem	35
The Value of Investigating Implicit Self-Esteem	36
Theoretical Interpretations of the Relationship between Implicit	40

and explicit Self-Esteem	
The Value of Investigating Implicit Self-Esteem in Bulimia Nervosa	45
Improving Implicit Self-Esteem	47
Conclusion	48
References	52
Empirical Paper:	73
<i>Implicit Self-Esteem in Eating Disorders</i>	
Abstract	74
Introduction	75
Method	83
Participants	83
Measures	85
Procedure	93
Results	93
Flower-Insect Implicit Associations Test	94
Self-Esteem Implicit Associations Test	95
Explicit Self-Esteem	99
Discussion	100
References	110
Appendices	123
Appendix A: School of Psychology Ethics Committee Approval Letter	124

Appendix B: COREC Approval Letter	125
Appendix C: Poster Advert	127
Appendix D: Participant Information Sheet	128
Appendix E: Consent Form	130
Appendix F: Debriefing Form	131
Appendix G: Debriefing Information	132
Appendix H: IAT Block Presentation	133
Appendix I: Example IAT Block Presentations	134

LIST OF TABLES

- Table 1:** Means, standard deviations and range of scores for both IATs **95**
for both the eating disordered ($n = 20$) and healthy control
($n = 20$) groups.
- Table 2:** Means, standard deviations and range of scores for both the **99**
eating disordered ($n = 20$) and healthy control ($n = 20$) groups
on the explicit measures.

LIST OF FIGURES

Figure 1: Interaction between the groups on the congruent and incongruent blocks of the SE-IAT.	96
--	-----------

ACKNOWLEDGEMENTS

I would like to give special thanks to my supervisors, Dr Lusia Stopa and Dr Lorraine Bell for their much valued guidance and support during the process and completion of this thesis. I would also like to thank Aiden Gregg for designing and allowing use of the IAT programmes and for providing statistical support. Finally, I thank all of those who participated in this study.

**THE ROLE OF SELF-ESTEEM IN BULIMIA NERVOSA
AND THE VALUE OF EXTENDING INVESTIGATIONS
INTO IMPLICIT SELF-ESTEEM**

Running Head: Bulimia Nervosa and Implicit Self-Esteem

Elaine S. Cockerham

Prepared for submission to Psychological Bulletin

Correspondence regarding this article should be addressed to:

Elaine S. Cockerham, Doctoral Programme in Clinical Psychology, (34
Bassett Crescent East), School of Psychology, University of Southampton,
Hants, SO17 1BJ. esc203@soton.ac.uk.

Abstract

Traditionally self-esteem has been measured using self-report questionnaires, however, more recently tools have been designed to measure and investigate implicit self-esteem. Although the evidence is only just developing, a lack of correlation is often found between implicit and explicit measures of self-esteem and thus it is thought that implicit self-esteem may operate in a different way to explicit self-esteem. Cognitive behavioural models of Bulimia Nervosa (BN) continue to emphasise the importance of self-esteem in the development and maintenance of the disorder, yet research findings fail to support a clear relationship between self-esteem and BN. Therefore, the question of whether the traditional method of measurement of self-esteem (i.e. using self-report) is adequate is raised. The aim of the literature review is to consider the role of self-esteem in BN and consider the value of furthering investigations into the area of implicit self-esteem. Therefore, cognitive behavioural theory of BN will be reviewed in order to understand the relevance of self-esteem within such theories. The literature that has attempted to investigate relationships between levels of self-esteem and BN will be considered. The research investigating implicit self-esteem will then be reviewed, and finally, the value of extending this research into the area of eating disorders considered.

KEYWORDS: *Bulimia nervosa, implicit self-esteem, explicit self-esteem, cognitive behavioural theory.*

Introduction

The concept of self-esteem refers to a person's evaluation of, or attitude towards him or herself (James, 1890) and the idea that individuals are keenly motivated to maintain high levels of self-esteem and to defend their self-esteem when it comes under threat is widely accepted by theorists (Pyszcznski, Greenberg, Solomon, Arndt, & Schimel, 2004). Indeed, the vast majority of psychological theories assume that self-esteem is a pervasive force in human motivation that is generally adaptive and is associated with a broad range of desirable outcomes. However, the pursuit of self-esteem can also lead to negative consequences and undesirable behaviour (Pyszcznski et al., 2004). For example, in Bulimia Nervosa (BN), an eating disorder with a high prevalence amongst women, self-esteem is thought to be derived from beliefs about body, weight and shape, which leads to a cycle of strict dietary control, followed by binge eating and compensatory behaviour. This review examines current conceptual models of BN and focuses particularly on the role of self-esteem within them.

Self-esteem is central to cognitive behavioural models of BN (e.g. Fairburn, Marcus, & Wilson, 1993b; Wilson, Fairburn, & Agras, 1997) and has long been recognised as important in the development and maintenance of the disorder. More specifically, self-evaluations in individuals with BN are believed to be influenced by body, shape and weight concerns, which are thought to determine the individual's self-esteem (DSM-IV: American Psychiatric Association, 2004). Cognitive behavioural therapy for Bulimia Nervosa (CBT-BN) based upon cognitive behavioural models has now been thoroughly investigated with consistent positive findings (e.g. Fairburn,

Peveler, Jones, Hope, & O'Connor, 1993a; Wilson & Fairburn, 1998; Agras, Crow, Halmi, Mitchell, & Kraemer, 2000a; Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000b; Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). As such CBT-BN is currently recommended as the first-line treatment for adults (National Collaborating Centre for Mental Health, 2004).

However, although CBT-BN is effective for some, approximately 50 percent of individuals do not recover and may actually derive no benefit at all (Wilson et al, 2002). As a result, the model upon which current treatment is based is open to question and has recently been expanded. In the latest expansion other key maintenance factors are hypothesised, including 'core low self-esteem', which involves global negative self-evaluations not specifically related to weight and shape. It is argued that core low self-esteem may account for poor outcome in certain individuals (Fairburn, Cooper, & Shafran, 2003) and some authors now suggest that treatment specifically for self-esteem is essential for successful recovery (Yellowless, 1997). To date, however, self-esteem has not been addressed directly in standard adaptations of CBT-BN.

Although self-esteem continues to be central to theories of BN, research has not always found a relationship between levels of self-esteem and BN (e.g. Garner, Olmsted, Davis, Rockert, Goldbloom, & Eagle, 1990; Davis, Olmsted, & Rockert, 1992; Turnbull, Schmidt, Troop, Tiller, Todd, & Treasure, 1997; Bell, 2002). Inconsistencies are particularly apparent where measurement has involved global self-esteem self-report questionnaires. As a result, some researchers have developed specific weight and shape related self-esteem questionnaires. Compared to measures of global self-esteem, in

some cases these appear better at distinguishing individuals with eating disorders from others (Geller, Johnston, Madson, Goldner, Remick, & Birmingham, 1998). However, this is contrary to recent theoretical developments that highlight the importance of global self-evaluations in BN (Fairburn et al., 2003).

Regardless of the particular dimension (e.g. global or weight related), in order to measure self-esteem in BN, researchers to date have relied on self-report questionnaires. The very nature of self-report measures, however, only enable investigation of explicit self-evaluations and as such are subject to a number of self-presentational biases (e.g. Kernis, Greenier, Herlocker, Whisenhunt, & Abend, 1997). Recent theoretical developments also suggest that self-esteem operates not only at an explicit level, but at an implicit level as well, involving unconscious, automatic processes. Implicit self-esteem therefore, would supposedly not be affected by self-presentational biases. This has led to a new wave of research investigating implicit self-esteem and a number of paradigms have been developed for this purpose. To date, however, no research exists to investigate implicit self-esteem in BN or indeed in eating disorders in general.

When comparing explicit and implicit measures of self-esteem in other areas of psychology (although the evidence is not conclusive), there is often a lack of correlation between the two. This suggests that explicit and implicit self-esteem may be independent constructs (Karpinski & Hilton, 2001). The implicit construct may involve an evaluation of the self that occurs unintentionally and without awareness (Greenwald & Banaji, 1995) and therefore may influence behaviours automatically without conscious

deliberation (McClelland, Koestner, & Weinberger, 1989). Whereas, the explicit construct may represent more conscious, deliberate assessment of self (Greenwald & Banaj, 1995) and therefore will guide more effortful and deliberate behaviour (McClelland et al., 1989). Research in BN that has only measured explicit self-esteem may only be providing half the picture. Some studies have also found that implicit self-esteem can predict behaviours that explicit self-esteem cannot (e.g. Hetts, Sakumu, & Pelham, 1999; Spalding & Hardin, 1999), and argue that both measures are required to provide an accurate account of an individual's self-esteem (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; Kernis, Abend, Goldman, Shrira, Paradise, & Hampton, 2005; Zeigler-Hill, 2006). Therefore, there may be serious limitations in restricting investigations of self-esteem in BN just to explicit self-report measures. Theoretical understanding of the disorder may be advanced if both explicit and implicit self-esteem is investigated.

The aim of this review is to consider the essential features of BN and the model upon which the current evidence based treatment is founded. Although other models of BN exist, they do not yet have the same evidence base to support their use and therefore will not be considered in this review. Particular attention will be given to the role of self-esteem, with consideration of how self-esteem has become so central to current theories of BN. The literature examining relationships between self-esteem and BN will be reviewed, including an examination of the weaknesses of self-report measures, followed by an introduction to implicit self-esteem and the measures developed to assess this. The inconsistencies found between explicit and implicit measures of self-esteem and theoretical explanations for

these differences will be considered. Finally, the value of investigating implicit self-esteem in BN will be discussed.

Description of Bulimia Nervosa

The critical disturbance in individuals with BN is that self-evaluation is unduly influenced by body, shape and weight, which are typically the most important factors in determining self-esteem (DSM-IV: American Psychiatric Association, 2004). The essential features of BN are *binge eating*, which is defined as eating an amount of food in a discrete period of time (usually less than two hours) that is definitely larger than most individuals would eat under similar circumstances, and inappropriate *compensatory methods*, such as purging by self-inducing vomiting, misusing laxatives, diuretics, or enemas, or non-purging methods such as, fasting, or excessive exercise to prevent weight gain (DSM-IV: American Psychiatric Association, 2004).

Individuals with BN are typically ashamed of their eating habits and therefore binges usually occur in secret. Binges are often associated with a sense of lack of control and may continue until the individual is uncomfortably or painfully full. Binge eating is typically triggered by dysphoric mood states, interpersonal stressors, intense hunger following dietary restraint, or feelings related to body weight, body shape, or food. While binge eating may transiently reduce dysphoria, disparaging self-criticism and depressed mood often follow (DSM-IV: American Psychiatric Association, 2004).

Compensatory behaviours then occur in order to counteract the effect of binge eating on weight. The person, therefore, usually maintains a weight within the normal range despite overeating, but commonly progresses into a vicious cycle of attempted dieting, binge eating, and compensatory purging,

frequently on a daily basis (National Collaborating Centre for Mental Health, 2004).

Prevalence of Bulimia Nervosa

The prevalence of BN is likely to be underestimated as individuals with BN tend to conceal their problems and avoid professional help (Hoek & van Hoeken, 2003). However, community studies show that BN is predominantly a female disorder and estimate the prevalence to be approximately one percent, with an even social class distribution (National Collaborating Centre for Mental Health, 2004). These rates steadily increased in developed countries during the 1980s and 1990s (National Collaborating Centre for Mental Health, 2004) but are now stable. The disorder is predominantly seen in older adolescents with a mean age of onset between 18 and 19 years (Hall & Hay, 2001). Between one and five percent of adolescent girls meet the criteria for BN, but up to 50 percent are thought to engage in occasional self-induced vomiting and binge eating (Hoek & van Hoeken, 2003).

Theory and Treatment of Bulimia Nervosa

Cognitive behavioural models of eating disorders have remained relatively unchanged for the last two decades (e.g. Fairburn, 1981; Slade, 1982; Fairburn, 1985; Fairburn & Cooper, 1997), with the early 'starvation-binge-purge' models being influential in the development of CBT-BN, first described by Fairburn in 1981 (Fairburn, 1981). Further procedural details were described in 1985 (Fairburn, 1985) together with a more complete exposition of the theory in 1986 (Fairburn, 1986). A full treatment manual was later published in 1993 (Fairburn et al., 1993b) and the theory elaborated further in 1997 (Fairburn & Cooper, 1997) when a supplement to the manual

was also produced (Wilson et al., 1997). A further expansion of the theory has recently been described (Fairburn et al., 2003).

The cognitive behavioural model of BN focuses on the centrality of overvalued ideas about body, weight, and shape, to which the initiation and maintenance of bulimic symptomatology are attributed (Fairburn & Cooper, 1997; Vitousek & Hollon, 1990; Cooper & Fairburn, 1993; Vitousek, 1996). This model suggests that BN occurs in a context where low-self esteem becomes linked with weight and shape concerns, which in turn become inextricably linked with self-worth. Indeed, the model posits that low self-esteem is the most proximal risk factor for developing overvalued ideas about body, weight, and appearance (Meijboom, Jensen, Kampman, & Schouten, 1999).

According to the theory, this dysfunctional system for evaluating self worth is central to the maintenance of BN (Fairburn et al., 2003). Whereas most people evaluate themselves on the basis of perceived importance in a number of domains of life (e.g. the quality of their relationships, work, parenting, etc), people with eating disorders judge themselves largely or exclusively in terms of their eating habits, shape or weight and also their ability to control them. Most of the other clinical features can be understood as stemming directly from this 'core psychopathology'. Individuals possessing overvalued ideas about weight and shape equate their self-worth with their body appearance and place great importance on exerting self-control over dietary restraint and losing weight. They try to adhere to multiple, extreme and highly specific dietary rules and tend to react negatively to the (almost inevitable) breaking of them, with even minor dietary slips interpreted as

evidence of their lack of self-control. The result is that they respond by temporarily abandoning their efforts to restrict their eating. Binge eating can then lead to various compensatory behaviours such as vomiting, excessive exercise and the use of laxatives to avoid gaining weight (Stice, 2001). A highly distinctive pattern of eating in which sustained dietary restraint is repeatedly punctuated by episodes of binge eating emerges. Binge eating in itself also maintains the 'core psychopathology' by magnifying concerns about ability to control eating, shape and weight. This encourages yet greater dietary restraint, thus further increasing the risk of binge eating.

Following the development of the cognitive behavioural model of BN, a number of research trials have investigated the benefits of CBT-BN (e.g. Fairburn et al., 1993a; Agras et al., 2000a; Agras et al., 2000b; Wilson et al., 2002) and over 60 randomised controlled trials have evaluated a range of treatments for BN (e.g. Thackwray, Smith, Bodfish, & Meyers, 1993; Joiner, Heatherton, & Keele, 1997; Wilfley & Cohen, 1997; Wilson & Fairburn, 1998). Their findings have been remarkably consistent, showing that CBT-BN is effective at reducing core features of BN, such as binge eating and is superior to other therapies because effects are achieved more quickly. There is also more evidence to support the use of CBT-BN compared to other therapies. As such, CBT-BN is recommended as the first-line treatment for adults with BN (National Collaborating Centre for Mental Health, 2004).

The existing evidence to support the use of CBT-BN is however, not without limitations. For example, most outcome studies have relied on self-report questionnaires as measures and have generally only measured improvement by considering reduction in bulimic behaviours (e.g. binge

eating) rather than looking at specific cognitions (Anderson & Maloney, 2001). Studies to date are also mainly pre, post-test designs, with some considering outcome at short-term follow up. Only one study (Fairburn, Norman, Welch, O'Connor, Doll, & Peveler, 1995) has considered long-term follow up and actually found that 37 percent of patients met diagnostic criteria (DSM-IV: American Psychiatric Association, 1994) for an eating disorder after treatment. Even at post-test, only 40 to 50 percent of patients being treated with CBT-BN cease binge eating and purging completely. Of the remainder, some show partial improvement, but a number appear to derive no benefit at all (Wilson et al., 2002). Therefore, although CBT-BN is well established, the treatment appears to have significant limitations. This raises questions about the validity of the underlying theory on which the treatment is based.

Given the limited effectiveness of CBT-BN, several researchers have criticised Fairburn's earlier model. First, it does not consider the wider social and psychological mechanisms that contribute to the development and maintenance of negative self-evaluations (Wilson et al., 1997; Wilson, 1999). As such, generic negative self-evaluation (low self-esteem) and broader negative affect (as antecedents to bulimic behaviours) are not addressed in standard adaptations of CBT-BN (e.g. Fairburn et al., 1993b; Wilson et al., 1997). This seems contrary to some evidence that has found that individuals with low self-esteem respond poorly to treatment (Fairburn, Kirk, O'Connor, Anastasiades, & Cooper, 1987; Fairburn et al., 1993a). Also, although negative self-evaluation (low self-esteem) is considered a risk factor in the development of BN, measures used to test the theory have generally not considered specific cognitions (Anderson & Maloney, 2001). Exploration of

negative thoughts associated with eating, shape and weight will likely reveal certain underlying assumptions and core beliefs not related to eating, weight and shape (Cooper, Wells, & Todd, 2004). Thus negative self-evaluation (low self-esteem) may actually extend further than eating, weight and shape. Indeed, the role of deeper level cognitions in BN has now begun. Particular types of automatic thought (Cooper et al., 2004), underlying assumptions (Cooper & Todd, 1997), and core beliefs (Cooper, Todd, & Cohen-Tovee, 1996; Waller, Ohanian, Meyer, & Osman, 2000) are important, and are thought to reflect global negative self-evaluation (Cooper, Todd, & Wells, 1998).

To summarise, many individuals appear to derive little or no benefit from CBT-BN, particularly in the longer term. Therefore, there may be weaknesses in the model upon which treatment is based and a more sophisticated model may be required (Grilo, Devin, Cachelin, & Yanovski, 1997). As such, greater emphasis has been placed on investigating and understanding specific and deeper level cognitions in BN, and it is now thought that self-evaluation extends beyond thoughts of eating, weight and shape to more global negative views of self.

Following these developments, Fairburn's earlier model has been extended (Fairburn et al., 2003). Specifically, the new theory proposes that in certain individuals one or more of four additional maintaining processes may interact with the core eating disorder maintaining mechanisms (specified in the earlier model), and when this occurs it is an obstacle to change. The first of these additional maintaining mechanisms concerns the influence of severe perfectionism. The second, the impact of unconditional and pervasive low

self-esteem ('core low self-esteem'). The third, difficulty coping with intense mood states ('mood intolerance') and the fourth is interpersonal and developmental in character ('interpersonal difficulties').

Of interest to this review is the inclusion of 'core low self-esteem'. The revised model proposes that a sub-group of individuals with BN have global negative views of themselves. Thus, rather than thinking negatively about themselves as a result of their inability to control their eating, weight and shape, these individuals have an unconditional and pervasive negative view of themselves (Fairburn et al., 2003). Negative self-evaluations in these individuals are seen as part of their permanent identity, are autonomous, and largely independent of performance. In other words they are less affected by changes in the state of the eating disorder. According to the model, such 'core low self-esteem' can obstruct change in general through two principal mechanisms and thus may account for some individuals who do not benefit from CBT-BN. First, core low self-esteem can create feelings of hopelessness about the individual's capacity to change, thereby undermining compliance with treatment. Second, it can result in them pursuing highly valued goals with particular determination, such as in this case, the pursuit of control over weight, eating and shape. Also the negative self-evaluative state is thought to be self-perpetuating as these individuals show particularly pronounced negative cognitive processing biases, combined with over-generalisation, and thus may perceive any 'failure' as confirmation that they themselves are failures, thereby reaffirming their overall negative view of themselves. As such if core self-esteem were corrected, outcome should improve as a result (Fairburn et al., 2003).

It therefore appears that self-esteem is a core concept in the latest theories and models of BN, and furthermore, that low self-esteem may account for a lack of treatment benefit for some individuals. Before reviewing the research that has considered the relationship between BN and levels of self-esteem, it may be of value to look at why self-esteem has become central to cognitive behavioural models and to understand how self-esteem operates in BN.

The Role of Self-esteem in the Development and Maintenance of Bulimia Nervosa

To summarise thus far, it is recognized that self-evaluations in individuals with BN are influenced by body, weight, and shape concerns, which are thought to determine their self-esteem. This is a key concept in theories and models of BN and noted as a defining diagnostic feature (DSM-IV: American Psychiatric Association, 2004). Prevalence studies also find that BN is predominantly a female disorder, with approximately 90 percent of those diagnosed being female, and that BN is more prevalent in Western societies (National Collaborating Centre for Mental Health, 2004). BN also often develops in late stage adolescence at a time of vulnerability when a number of psychological and physical changes are occurring (Feldman, Feldman, & Goodman, 1998). Social theorists have attempted to explain why it is that weight, body and shape concerns seem to be most apparent in young females in Western societies.

Western culture appears to value the physical body (Goldenberg, McCoy, Greenberg, Psyzczynski, & Solomon, 2000). The media bombard us with images of the ideal appearances of men and women and evidence

reveals that individuals who are perceived as meeting these standards of attractiveness are rewarded. Attractive individuals are seen as more interesting, kind, outgoing, strong, and intelligent (Dion, Berscheid, & Walster, 1972; Eagly, Ashmore, Makhijana, & Longo, 1991; Ritts, Patterson, & Tubbs, 1992). They are more likely to be employed (Marlowe, Schneider, & Nelson, 1996), to be pursued for romantic relationships (Singh & Young, 1995) and are generally more popular and socially skilled than unattractive people (Feingold, 1992). Unfortunately, a consequence of living in such a body orientated culture is that the standards of attractiveness and fitness may become internalized (McKinley & Hyde, 1996; Fredrickson & Roberts, 1997; Morry & Staska, 2001). The physical body may then become a potential source of self-esteem. Although individuals who believe they are meeting these standards may derive a variety of psychological benefits from their bodies (e.g. Berscheid, Walster, & Bohmstedt, 1973; Cash, 1990), those who believe they are failing to meet the standards may develop a hypercritical view of their body (Wiederman & Pryor, 1999).

It also seems that females are most vulnerable to socialisation processes. Social and cultural pressures towards thinness in females are reflected in normative dissatisfaction with weight, body size, and appearance in industrialized, Western societies (Striegel-Moore, Silberstein, & Rodin, 1986; Fallon, Katzman, & Wooley, 1994). The incorporation of cultural beliefs regarding thinness as the equivalent of female beauty may lead to a greater drive for thinness. As such, failure to meet these standards may lead to reduced self-esteem, and negative evaluations, where weight and shape is overvalued, thus leading to engagement in extreme dietary restriction (Polivy

& Herman, 1993) and possibly the development of an eating disorder such as BN.

Not all women, however, who fail to meet cultural standards develop eating disorders. As previously discussed, more recent research investigating deeper level cognitions has shown that negative self-evaluations and assumptions appear to be important to the development of eating disorders (Cooper et al., 1996) but are not characteristic of normal dieters (Cooper & Turner, 2000). Therefore, normal dieters may indeed be influenced by cultural standards, but may be protected from developing eating disorders because they hold more positive self-evaluations. On the other hand, negative self-evaluations (i.e. core low self-esteem) may render individuals who are equally influenced by cultural standards more likely to develop an eating disorder (Vitousek & Hollon, 1990; Silverston, 1992; Wood, Waller, & Gowers, 1994; Button, Sonuga-Barke, Davies, & Thompson, 1996; Yellowlees, 1997; Fairburn, Shafran, & Cooper, 1999; Fairburn et al., 2003).

To summarise, cultural standards may play a part in determining beliefs and values about appearance, weight, and shape and these may become a source of self-esteem. This may then lead to certain individuals (particularly females) striving to achieve these standards in order to enhance their self-esteem, particularly if they already hold core negative self-evaluations. If, as discussed, such negative self-evaluations do have a more central role in the development and maintenance of BN than previously thought, a vicious cycle of low self-esteem leading to a desire for improvement through striving for the thin ideal may result. This may lead to symptoms of BN that further reduce self-esteem (Yellowlees, 1997), and may

account for poor treatment outcome (Loeb, Wilson, Gilbert, & Laubovie, 2000). However, the existing literature fails to support a clear relationship between low self-esteem and BN. A conflict between one group of studies which show a relationship between levels of self-esteem and BN and another group that does not will now be discussed.

The Relationship between Self-esteem and Bulimia Nervosa

Despite research endeavours over the past few decades there remains little agreement regarding the interplay of factors involved in the development, maintenance, and treatment of BN. BN appears to have multifactorial aetiologies, with familial, intrapersonal, biological, cultural, and psychological factors involved in the development of the disorder (Agras & Kirkley, 1986; Strober, 1986; Blouin, Zuro, & Blouin, 1990; Mirkin, 1990; Nussbaum, 1992; Woodside, 1995; Streiger, Young, Ng Ying Kin, Koerner, Israel, Lageix et al., 2001). In relation to self-esteem, a number of studies have found a relationship between levels of self-esteem and BN (Garner & Garner, 1986; Hesse-Biber & Marino, 1991; Silverston, 1990; Weiss & Ebert, 1983), although it remains unclear whether low self-esteem precedes the onset of BN or whether it is a symptom of the disorder (Jacobi, Hayward, de Zwann, Kraemer, & Agras, 2004). A further body of evidence exists that shows that improved self-esteem aids recovery from BN and helps to maintain treatment benefits. This would suggest that self-esteem plays an important role in BN. Yet other research has failed to find any association between levels of self-esteem and features of BN.

First, when looking at the evidence that supports a relationship between levels of self-esteem and BN, it is clear that a number of cross

sectional studies have found that individuals with BN exhibit lower self-esteem than healthy controls (Freeman, Sinclair, Turnbull, & Annandale, 1985; Baell & Wertheim, 1992; Garner, Rockert, Davis, Garner, Olmstead, & Eagle, 1993; Davis, McVey, Heinman, Rockert, & Kennedy, 1999). There are however, limitations to these studies. For example, healthy controls are most often selected from college students who have higher prevalence rates of eating disorders. It is also difficult to conclude that low self-esteem is specific to BN rather than more generally to other psychiatric disorders as few studies have included a psychiatric control group. In addition, with the exception of one study (Jacobi, Thomas, de Zwann, Nutzinger, & Dahme, 2002) depressive symptomology was not controlled for. Depression and self-esteem are highly correlated (Haaga, Dyck, & Ernst, 1991; Bernet, Ingham, & Johnson, 1993) and therefore it is unclear whether the self-esteem deficits found in these studies were confounded by depressive symptomology. However, encouragingly, one study has found that after controlling for depression, self-esteem was lower among individuals with eating disorders, and also that self-esteem was lower than in a psychiatric control group (Jacobi et al., 2004).

A series of cross sectional studies have also attempted to retrospectively assess self-esteem prior to the onset of the eating disorder (Fairburn, Welch, Doll, Davies, & O'Connor, 1997; Fairburn, Cooper, Doll, & Welch, 1999). Negative self-evaluation predating the onset of the disorder was more common in individuals with current eating disorder symptoms than in healthy controls. However, the reliability of these findings are questionable

as they rely on retrospective measures and also once again these studies failed to control for depressive symptomology.

On the basis of longitudinal assessment, there appears to be a slight superiority of studies confirming the presence of low self-esteem prior to the onset of an eating disorder. For example, low self-esteem predicted elevated eating disorder symptomology four years later in a sample of adolescent girls (Button et al., 1996), and in another study was associated with development of an eating disorder two years later (Ghaderi & Scott, 2001).

Self-esteem has also been found to moderate the interaction between other key factors in eating disorders, namely perfectionism and perceived weight status, in predicting bulimic symptoms (Vohs, Bardone, Joiner, & Abrahamson, 1999). More specifically, women who perceive themselves as overweight and who are also high in perfectionism are less likely to exhibit bulimic symptoms if they have high self-esteem. On the other hand those with low self-esteem and similar stress conditions are more likely to exhibit bulimic symptoms (Vohs et al., 1999). Self-esteem was also found to partially mediate the relationship between externalized self-perceptions and a combined measure of weight and shape concern, which in turn fully mediated the relationship between self-esteem and both dietary restraint and uncontrolled eating in an undergraduate female sample (Ross & Wade, 2004).

Raising self-esteem can in some cases, enhance recovery from BN. For example, those with lower levels of self-esteem have been found to respond more poorly to treatment (Fairburn et al., 1987; Baell & Wertheim, 1992; Fairburn et al., 1993a). Also, although in an uncontrolled study, a

group for individuals with eating disorders, aimed specifically at raising self-esteem, greatly improved not only symptoms of self-esteem and depression, but also eating attitudes (Newns, Bell, & Thomas, 2003). Raising self-esteem is also helpful in maintaining change following treatment (Beresin, Gordan, & Herzog, 1989; Hsu, Crisp, & Callender, 1992; Rorty, Yager, & Rossotto, 1993; Petersen & Rosenvinge, 2002). In one of the few studies to assess self-esteem at 18 month follow up, individuals who had recovered from BN, reported an increase in self-esteem (Troop, Schmidt, Turnbull, & Treasure, 2000).

Despite the limitations, some studies have shown that self-esteem is lower in individuals with eating disorders and that self-esteem may play a part in improved treatment outcome. As such, this research provides support for theorists who propose that self-esteem acts centrally in the cycle of perpetuating eating disorder symptoms (e.g. Yellowless, 1997).

However, whilst a large number of studies support a relationship between BN and levels of self-esteem, contradictory evidence has also been found. A number of studies have failed to find any association between levels of self-esteem and BN (Garner et al., 1990; Davis et al., 1992; Turnbull et al., 1997; Bell, 2002).

Those providing narrative reviews of predictors of outcome specifically for BN have found few consistent factors (Keel & Mitchell, 1997; Vaz, 1998). In the study with the largest sample size of any to date, self-esteem as a pre-treatment factor did not predict outcome (Bell, 2002) and as such is not listed as a primary predictor of outcome for treatment of BN in the current NICE guidelines (National Institute of Clinical Excellence: National Collaborating

Centre for Mental Health, 2004). It would seem then that given the contradictory evidence and the amount of evidence that has failed to support a relationship between levels of self-esteem and BN that the overall aetiology of BN remains unclear (Jacobi et al., 2004). Furthermore, the evidence supporting a relationship between BN and levels of self-esteem should be considered with regards to the conflicting evidence and in the light of methodological weaknesses.

Apart from the methodological weaknesses already discussed (e.g. sample selection, shortfall of longitudinal data, and confounding of depressive symptomology), the way in which self-esteem is conceptualised and measured may also be a limitation of the research to date that has investigated self-esteem in BN.

Conceptualisation and Measurement of Self-esteem in Bulimia Nervosa

Traditionally, self-esteem was conceptualised as a global, unidimensional construct regarding the personal judgement of one's own worth (Rosenberg, 1965). A variety of global self-esteem measures exist and have been used to assess the contribution of self-esteem in eating disorders, such as the Rosenberg Self-Esteem inventory (RSE: Rosenberg, 1965) and the Robson self-esteem inventory (Robson, 1989). However, more recent conceptualisations of self-esteem suggest that it is multidimensional (Marsh, 1986). In BN weight and shape concerns are considered a possible dimension of self-esteem and measures have now been developed to assess shape and weight related aspects of self-esteem, such as the Shape And Weight Based Self-esteem inventory (SAWBS: Geller, Johnston, & Madston, 1997). The SAWBS has been found to distinguish females with eating

disorders from other psychiatric groups and healthy controls, whereas some global measures of self-esteem have not (Geller et al., 1998).

The research using the SAWBS suggests that how individuals find sources of self-esteem (e.g. from attributes of body, shape, and weight) is critical to eating disorder aetiology and maintenance, yet cognitive behavioural models of BN suggest that core (global) low self-esteem is critical. Although research using the SAWBS consistently distinguishes individuals with eating disorders from those without, given the implication of core low self-esteem in BN, it should be possible to measure self-esteem using one of the available global measures of self-esteem. It therefore seems curious to develop and use weight and shape related self-esteem measures. Particularly given the importance placed on core low self-esteem in current models of BN, which emphasise the nature of more global negative self-evaluations rather than self-esteem being linked to specific attributes of weight, shape and eating.

Limitations of Self-Report Measures

Regardless of the type of self-esteem measure used, either global or dimension specific, a further weakness of these measures is that they are all self-report questionnaires. That is, they rely on the individual to explicitly report feelings about themselves. Although, traditionally it has been common practice to measure self-esteem using direct self-report questionnaires (Allport, 1937; Rogers, 1951; Rosenberg, 1979; Tatarodi & Swann, 1995), there are a number of limitations to consider when using self-report measures.

Self-report measures have been heavily attacked for a number of years. They are argued to be unstable (Kernis et al., 1997; Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000), susceptible to demand characteristics (Orne, 1962), and evaluation apprehension (Rosenberg, 1969). They are also confounded by impression management (Tedeschi, Schlenker, & Bonoma, 1971; Weber & Cook, 1972), social desirability, self-deception and the need for approval (Aidman, 1999).

Despite the limitations of self-report measures, many are well validated and reliable, and generally quick and easy to administer. With a lack of other more ecological measures, self-report has continued to be used in both research and clinical practice. However, this does not make such practice acceptable, especially as it has been suggested that some elements of self-esteem may operate implicitly and as such self-evaluation may be inaccessible to self-report (Greenwald & Banaji, 1995).

When considering self-esteem, conventional psychological theory proposed that self-evaluative processes operated through conscious (explicit) self-reflection (Sedikides & Strube, 1997; Baumeister, 1998). More recent evidence however, finds that many important social-cognitive processes can function without any need for conscious guidance (Greenwald & Banaji, 1995; Bargh & Chartrand, 1999) and thus self-evaluations may operate at unconscious (implicit) levels (Kihlstrom & Cantor, 1984; Devine, 1989; Greenwald & Banaji, 1995; Kihlstrom, 1999; Koole, Dijksterhuis, & van Knippenberg, 2001; Pelham, Mirenberg, & Jones, 2002). It appears then, that certain elements of self-esteem (implicit) may be inaccessible to introspection and may be undetected by self-report measures. Rather implicit self-esteem

may only be observed indirectly using implicit measures, where individuals should be unaware of and unable to exercise control over the processes being assessed.

Implicit Measures

Indeed, following the resurgence of theorising, a number of paradigms designed to measure automatic reactions (i.e. implicit attitudes) to certain stimuli have been developed in recent years, such as the affective priming task (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), the Go/no task (GNAT; Nosek & Banaji, 2001), the Extrinsic Affective Simon Task (EAST; De Houwer, 2003), and the masked affective priming task (Frings & Wentura, 2003). Unfortunately the reliability of these measurement methods is either unknown (e.g. EAST and masked affective priming) or is very low, based on the handful of studies where it has been tested (e.g. affective priming, $\alpha = .26$, Banse, 2001; GNAT, split half reliability = .20, Nosek & Banaji, 2001). The most reliable procedure to date that measures implicit attitudes is the Implicit Associations Test (IAT: Greenwald, McGhee, & Schwartz, 1998), which is a computer based reaction time measure that assesses the relative strength of association between two concept categories. The simple idea behind the IAT is that it should be easier to map two concepts onto a single response when those concepts are somehow similar or associated in memory (e.g. flowers and positive words, and insects and negative words) than when the concepts are dissimilar or unrelated (e.g. flowers and negative words, and insects and positive words). Typically the IAT has been used to assess positive and negative evaluations of certain social stimuli, such as

different races (Greenwald et al., 1998; Dasgupta, McGhee, Greenwald, & Banaji, 2000) and religions (Rudman, Greenwald, Mellott, & Schwartz, 1999).

More recently, the IAT has been used to measure implicit self-esteem (SE-IAT: Greenwald & Farnham, 2000). Implicit self-esteem is defined as “the introspectively unidentified (or inaccurately identified) effect of the self-attitude on evaluation of self-associated and self-dissociated objects” (Greenwald & Banaji, 1995, p. 11). This suggests that self-esteem goes hand in hand with positive self-evaluation of self-associated stimuli. Measurement is achieved by pairing positive and negative words with concepts related to self, (e.g. me, self, and my) and other (e.g. they and them). Positive implicit self-esteem would be reflected in individuals who find it easier (are faster) to respond to positive and self (or negative and other) than positive and other (or negative and self) paired concepts.

The IAT is now the most widely used implicit assessment method, with the greatest evidence of construct and predictive validity (Perugini, 2005). Several studies have shown good IAT internal consistency values (usually $\alpha = .80$), and reasonable test-retest values (usually $r = .60$) (Bosson, Swann, & Pennebaker, 2000; Greenwald & Farnham, 2000; Koole et al., 2001).

Given the recognition of implicit self-esteem and the relative reliability and validity of the SE-IAT, it has now been used extensively in studies of self-esteem (e.g. Hetts et al., 1999; Bosson et al., 2000; Koole et al., 2001; Rudman, Greenwald, & McGhee, 2001b). With traditional explicit measures appearing to be subject to a number of self-presentational biases and appearing to provide an incomplete picture of self-esteem, there appears to be value in investigating implicit self-esteem. Before looking at the research

investigating implicit self-esteem and the value this may add to the existing knowledge and theories of self-esteem, it may be worthwhile to first consider one theoretical attempt to understand how implicit self-esteem may have developed and why it may be different to explicit self-esteem.

The Development of Implicit Self-Esteem

It is proposed that implicit elements of self-esteem may develop in early childhood when self-evaluations become automated (Koole et al., 2001). For example where young children's self-evaluations are often characterised by a preference for positive feedback, as found in their preference for voices that sound accepting (Fernald, 1993). This initial tendency towards positivity may reflect young children's primary concern with establishing a secure position of the self (Solomon, Greenberg, & Pyszczynski, 1991). Self-enhancement then occurs by accepting positive information and rejecting negative information, which fits with the notion that individuals are generally motivated to maintain high levels of self-esteem and defend their self-esteem when it comes under threat (Pyszczynski et al., 2004). Implicit self-evaluations then are likely to be produced by rather primitive self-enhancement mechanisms, are therefore automatic and unintentional, and may influence behaviour automatically. Alternatively, explicit self-evaluations may involve more sophisticated cognitive judgements of self (Koole et al., 2001) and involve conscious and deliberate processes and may guide more deliberate, conscious behaviour (McClelland et al., 1989).

From this viewpoint it would seem that explicit and implicit self-esteem operate in different ways and as such may not be related. Indeed there is

now reliable evidence of the existence of both implicit (unconscious) and explicit (conscious) self-esteem (Hetts et al., 1999; Hetts & Pelham, 2002) with interesting findings. Attention will now be turned to the research investigating the existence of implicit self-esteem, with particular reference to the similarities and differences found between implicit and explicit measures.

The Value of Investigating Implicit Self-Esteem

First, by considering the evidence that has found differences between implicit and explicit measures, it appears that a lack of correlation has emerged. In a systematic evaluation of the correlations between various measures of implicit and explicit self-esteem (although some implicit measures correlated significantly with explicit measures) the magnitude of the observed correlations was relatively small (all $r < .27$; Bosson et al., 2000). Other studies have also found weakly positive correlations (Spalding & Hardin, 1999; Greenwald & Farnham, 2000; Bosson, 2003; Jordan et al., 2003). Specifically in relation to the IAT, although the group based averages on the IAT and explicit measures typically correspond, the correlational data are more ambiguous. By averaging the correlations that emerged between the IAT and explicit attitudes across three studies, an average correlation of $r = .25$ was found (Greenwald et al., 1998). Examination of the individual correlations shows that they ranged from $r = -.04$ to $r = .64$, with only two of the 16 reaching conventional levels of significance (Karpinski & Hilton, 2001).

Interestingly one particular study found that implicit self-esteem predicted some behavioural consequences that explicit self-esteem did not (Spalding & Hardin, 1999), supporting the idea that implicit and explicit systems are distinct. In this study, participants took part in either a self-

relevant or a self-irrelevant interview and were then rated by the interviewer on their anxiety. When the interview was self-relevant participants low in implicit self-esteem appeared more anxious than participants high in implicit self-esteem. Explicit self-esteem on the other hand did not predict participants' apparent anxiety (Devos & Banaji, 2003). Therefore, knowing a person's level of explicit self-esteem may tell us virtually nothing about his or her level of implicit self-esteem, and many individuals who report positive self-views may also possess relatively negative implicit self-views. This suggests that although individuals may be motivated to defend their self-esteem by explicitly reporting higher levels, their measure of implicit self-esteem may provide a more accurate reflection of their actual self-esteem.

However, it has been suggested that the notion of two distinct self-esteem systems (implicit and explicit) is inferred, rather than directly tested (Fazio & Olson, 2003). It is suggested that their typically low correlation provides evidence not of the existence of two independent systems, but rather of the discriminant validity between two different types of measures, where one relies on self-report (explicit evaluations), and the other on reaction times (implicit evaluations).

Furthermore, in opposition to the evidence that finds a lack of correlation between implicit and explicit measures of self-esteem, some research has shown that implicit and explicit measures of self-esteem are predictably related and has found degrees of correspondence between them (Blair, 2002). When collapsing across individuals, the pattern of means that typically emerge in implicit studies using the IAT, show that the IAT and explicit measures reveal the same overall preference. That is, the same

pattern of results appear on explicit and implicit measures, showing that individuals have more favourable attitudes towards flowers than towards insects, towards musical instruments than weapons, and towards 'White' names than 'Black' names in a Caucasian American sample (Greenwald et al., 1998). However, this data includes evaluation of a range of attitudes and is not specific to self-esteem.

Low implicit self-esteem is also found to have negative consequences that are comparable to those of low explicit self-esteem. This is demonstrated in individuals with low implicit self-esteem who show diminished levels of aspiration after failure (Greenwald & Farnham, 2000) and more anxiety during a personal interview (Spalding & Hardin, 1999) than individuals with high implicit self-esteem, which may suggest explicit and implicit self-esteem operate in a similar manner.

Similarly, threats to self-concept that can lead to decreased explicit self-esteem can also lead to decreased implicit self-esteem (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999; Jones, Pelham, Mirenberg, & Hetts, 2002). However, if existential threats operate most strongly at unconscious levels (Arndt, Greenberg, Pyszczynski, & Solomon, 1997), it is likely that high implicit self-esteem rather than high explicit self-esteem would better enable an individual to cope with such threats. Low implicit self-esteem on the other hand may result in a diminished ability to cope with such threats. If existential threats do operate most strongly at implicit levels then the 'buffer' function of implicit self-esteem against threatening experiences (see Pyszczynski et al., 2004 for a review of self-esteem theories) could well be more important than that of explicit self-esteem (Hetts & Pelham, 2002). Therefore, even if implicit

and explicit self-esteem operate in a similar manner it may be beneficial to assess levels of implicit self-esteem as well as explicit self-esteem.

Preliminary evidence does indeed suggest that high implicit self-esteem is more important for coping with stigmatization than high explicit self-esteem (Hetts & Pelham, 2002). Therefore, similarly, high implicit self-esteem may protect individuals from developing eating disorders. For example, if existential threats to self-esteem such as cultural idealisation of thinness and denigration of fatness that drive body dissatisfaction and weight loss attempts are implicitly received and processed (Grover, Keel, & Mitchell, 2003), high implicit self-esteem may serve to protect ('buffer') individuals against such threats.

Given the inconsistencies in the research findings, a number of theoretical interpretations of the relationship or lack of relationship, between implicit and explicit measures have been proposed and may offer an insight in to how implicit and explicit self-esteem operate. One theory supports the idea of explicit and implicit attitudes as single constructs (unitary model) and therefore, would expect implicit and explicit measures to be related. Another theory supports the idea of the independent model of the relationship between implicit and explicit attitudes, and would expect to find differences between the measures. Finally, a third perspective, the environmental association model suggests that exposure to cultural stereotypes will influence relationships between implicit and explicit measures, and therefore, supports the idea that implicit and explicit measures may or may not be related.

Theoretical Interpretations of the Relationship between Implicit and Explicit Self-Esteem

The independent model considers implicit and explicit attitudes as independent and unrelated, which tap different underlying constructs, (Devine, 1989; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Greenwald & Banaji, 1995; Wilson, Linsey, & Schooler, 2000). According to this theory, an individual may have two attitudes towards the same object, one implicit and one explicit at the same time (Wilson et al., 2000). Therefore, this theory supports the idea that implicit and explicit measures may predict completely different aspects of behaviour (Hetts et al., 1999; Spalding & Hardin, 1999).

Alternatively, the unitary model theorises that implicit and explicit attitudes reflect a single attitudinal construct (Fazio & Olsen, 2003). According to this perspective, attitudes are similar to icebergs, with explicit attitudes residing above the surface of conscious control and implicit attitudes residing below it. The activation of an evaluation is presumed to follow a single processing stream. Implicit measures tap the evaluation before conscious control processes can be initiated, and explicit measures tap the evaluation after intentional processes have had opportunity to alter the response. From this perspective implicit and explicit evaluations differ only to the extent that explicit responses are altered through controlled processes (Fazio & Olsen, 2003).

If implicit and explicit measures tap a single attitudinal construct, albeit in different places, one implication of this view is that, given the right conditions, implicit attitudes, explicit attitudes, and attitude-related behaviours

should all correlate. On the other hand an implication of the independent model is that correlations between the IAT and explicit measures should be low to non-existent. Having reviewed the literature in this area it appears that there is contradictory evidence. Therefore, perhaps neither the unitary or independent theory adequately account for the similarities or differences found between implicit and explicit measures.

Alternatively, an environmental association model has been proposed (Karpinski & Hilton, 2001) that suggests that exposure to cultural stereotypes will influence the relationship between implicit and explicit measures. To explain more fully, an IAT study found that Korean participants showed an IAT bias for Korean names over Japanese names, whereas Japanese American participants showed a bias for Japanese names over Korean names (Greenwald et al., 1998). It is interesting to note that this effect was moderated by the degree to which participants were immersed in Asian culture. The more a Korean was immersed in Asian culture, the greater bias he or she showed for Korean names. Similarly, the more a Japanese participant was immersed in Asian culture, the greater bias he or she showed for Japanese names. Individuals who are more immersed in Asian culture are presumably more likely to be exposed to the knowledge of that culture, including its stereotypes. Perhaps it is this immersion that the IAT detects rather than the extent to which a person consciously or unconsciously endorses cultural stereotypes (Karpinski & Hilton, 2001). These results suggest an environmental association model of implicit attitudes. Whereas explicit measures assess an individual's level of endorsement toward an attitude object, implicit measures may tap associations a person has been

exposed to in his or her environment. According to the environmental association model of implicit attitudes, a high score on a 'White/Black' IAT, for example, should not be seen as indicating that the individual has more favourable evaluations of 'White' individuals compared to 'Black' individuals. Instead, the score may simply indicate that the individual has been exposed to a larger number of positive-White and negative-Black associations than negative-White and positive-Black associations. Therefore, according to the environmental associations model implicit and explicit measures may reflect similarities or differences depending on exposure to cultural stereotypes and whether an individual explicitly endorses or denies a certain attitude.

Rather than joining the debate about whether or not measures of explicit and implicit self-esteem correlate an interesting series of studies has emerged that emphasise the importance of both the similarities and the differences found between implicit and explicit measures of self-esteem (Jordan et al., 2003; Kernis et al., 2005; Zeigler-Hill, 2006). These researchers suggest that similarities or differences may exist between measures of implicit and explicit self-esteem and that discrepancies found between the measures are important and may reflect 'fragile' self-esteem (Jordan et al., 2003; Kernis et al., 2005; Zeigler-Hill, 2006).

This research is based on the premise that the pursuit or existence of high self-esteem may be associated with less desirable or adaptive behaviour. Although typically high self-esteem is viewed as an indicator of psychological health, conflicting views of its adaptive value can be found in the literature. On the one hand self-esteem is thought to reflect optimal functioning and it is seen as a necessary precursor to productivity and

happiness (Baumeister, 1998). Indeed, positive self-views are associated with less depression (Tennen & Affleck, 1993), less neuroticism (Robins, Hendin, & Trzesniewski, 2001), and higher levels of life satisfaction (Diener, 1984). Yet when positive self-views are cast as vanity, conceit, arrogance, or narcissism, they assume more negative connotations. Rather than indicating healthy adjustment and well-being, overly positive self-opinions can signal maladjustment and delusion (Colvin, Block, & Funder, 1995).

In this vein positive self-views have been linked to a number of behaviours that can be viewed as defensive and potentially maladaptive, such as prejudice (Crocker, Thompson, McGraw, & Ingerman, 1987), aggression and violence (Baumeister, Smart, & Boden, 1996), and pervasive self-serving biases (Blaine & Crocker, 1993). Interestingly participants high in explicit self-esteem, but low in implicit self-esteem have the highest levels of narcissism, an indicator of defensiveness, and those with relatively low-implicit self-esteem but high explicit self-esteem behave more defensively (Jordan et al., 2003). Therefore, it is argued that both measures are required to portray an accurate picture of self-esteem (Jordan et al., 2003; Kernis et al., 2005; Zeigler-Hill, 2006). True high self-esteem is depicted as secure and adaptive when both implicit and explicit self-esteem is high, whereas self-esteem is seen as fragile and maladaptive when implicit self-esteem is low and explicit self-esteem high.

To recap, there are contradictory findings in the research investigating relationships between implicit and explicit measures of self-esteem and a number of theories have been presented to explain these differences (and/or similarities). Although inconclusive, the majority of the research to date has

found that implicit and explicit measures are weakly correlated thus suggesting that implicit and explicit self-esteem are distinct processes. As a result implicit and explicit self-esteem can operate in different ways (e.g. Greenwald et al., 1998) and in some cases implicit self-esteem can predict behaviour where explicit self-esteem cannot (Hetts et al., 1999; Spalding & Hardin, 1999). High implicit self-esteem may also offer more protection against existential threats to self that operate strongly at an unconscious level. If this is the case then the validity of measuring self-esteem through self-report measures alone should be questioned as they would only provide half of the picture. Indeed, a true picture of self-esteem may only be achieved by measuring both implicit and explicit self-esteem (Jordan et al., 2003; Kernis et al., 2005; Zeigler-Hill, 2006).

Despite further investigations being required, these preliminary findings demonstrate the importance of continuing this investigation and the possible value of measuring implicit self-esteem. Investigating levels of implicit self-esteem might actually provide entry into the mind of the eating disordered individual that cannot be achieved with explicit self-report measures (Vartanian, Polivy, & Herman, 2004). Given the weaknesses of explicit self-report measures, and the differences found between explicit and implicit measures, measures of implicit self-esteem may also provide more accurate and useful data that is not influenced by pressures to appear socially desirable or by other potential response biases. Implicit measures may also better predict risk of developing BN than the currently used explicit measures.

The Value of Investigating Implicit Self-esteem in Bulimia Nervosa

Although there has been a surge in research on implicit self-esteem, to the author's knowledge, to date, no research exists that directly assesses implicit self-esteem in individuals with BN (or eating disorders generally). This is despite the central importance of global core low self-esteem theorised in recent cognitive behavioural models.

A few studies have however begun to investigate implicit attitudes amongst individuals with eating difficulties (e.g. restrained eaters and obese individuals) compared to healthy controls. For example, an investigation of implicit and explicit attitudes towards high fat foods in obesity, found that obese people found it easier to respond with the same key to the combination of high-fat words and negative words as compared with the reversed combination, suggesting that they have an implicit negative attitude towards high-fat foods. The same result was found among normal weight controls, but the effect was less pronounced (Roefs & Jansen, 2002).

In a further study which investigated whether restrained eaters had stronger schematic associations between meal size and body size, than did unrestrained eaters, both groups were found to have equally strong automatic associations between meal-size and body-size stimuli. That is, both groups were much quicker to respond to pictures of large meals and fat words (and pictures of small meals and thin words) paired together on a single response key than they were to pictures of large meals and thin words (and pictures of small meals and fat words) paired together (Vartarian et al., 2004).

Gender differences in implicit and explicit attitudes towards being overweight have also been investigated. Normal weight and overweight individuals completed the IAT and an explicit measure of eating disorder. It was found that men implicitly identified themselves as light regardless of actual weight, whereas women's implicit weight status was related to actual weight, explicit weight appraisal and implicit self-esteem. In other words women demonstrated an implicit association between heavy and bad. Thus women seemed to accept weight as a defining aspect of their value, whereas men appeared to be protected somehow from body dissatisfaction by failing to identify themselves as heavy, even when they were objectively overweight (Grover et al., 2003).

Although the research in this area to date is sparse, there is indeed some evidence to suggest that implicit attitudes exist and are different in individuals with eating difficulties, compared to those without. Also the evidence to suggest that implicit attitudes differ for men and women (with women making more implicit associations between heavy and bad) is interesting given that BN is predominantly a female disorder.

Hypothetically, by reviewing the existing literature on implicit self-esteem in other areas of psychology and by accepting the hypothesised importance of core low self-esteem in BN, it would seem that understanding and investigating implicit self-esteem in BN may be of great importance. Furthermore, some research has started to investigate ways to improve implicit self-esteem which will now be reviewed.

Improving Implicit Self-Esteem

There is now some evidence investigating ways to improve implicit self-esteem using the principles thought to contribute to its development. For example, if implicit attitudes measured by the IAT are learned associations, it follows that implicit attitudes could be unlearned by repeating pairings that are contrary to the associations that currently exist and that this would result in improved implicit self-esteem. One study has indeed found that presenting participants with repeated pairings of the category 'old people' with positive words resulted in a significant reduction in the strength of the implicit associations assessed by the IAT, whereas explicit attitudes remained the same (Karpinski & Hilton, 2001). A further study influenced implicit self-esteem through classical conditioning (Baccus, Baldwin, & Packer, 2004). Participants played a computer game where self-relevant stimuli (e.g. the individual's name) or non relevant stimuli were paired with smiling faces, rejecting faces, or neutral faces. Every time the participants clicked on a self relevant stimulus a smiling face appeared. Amongst individuals with low self-esteem, repeated pairing of self-relevant stimuli with smiling faces increased implicit self-esteem as measured with the IAT. Potentially then, if low implicit self-esteem was found to exist in individuals with BN (and assuming this is the result of learned associations) then treatments that involve counter-attitudinal pairings could potentially alter these implicit attitudes (Vartanian et al., 2004). This would then modify unconscious maladaptive beliefs as in one aim of cognitive therapy. It is not known however, whether prolonged changes in implicit attitude occur. Also, cognitive behavioural therapy for low

self-esteem may in itself improve implicit self-esteem but has not yet been investigated.

Conclusion

In summary, self-evaluations in individuals with BN are believed to be influenced by body, weight and shape concerns, which are thought to determine their self-esteem (DSM-IV, American Psychiatric Association, 2004). Yet, research investigating relationships between levels of self-esteem and BN (using measures of global explicit self-esteem) yield inconsistent findings (e.g. Garner et al., 1990; Davis et al., 1992; Turnbull et al., 1997; Bell, 2002). Therefore, researchers have developed more dimension specific measures of self-esteem based on the links between shape and weight concerns and self-esteem (Geller et al., 1997). Whilst such measures of shape and weight based self-esteem have been found to be better at distinguishing individuals with eating disorders from others (Geller et al., 1998), this seems contrary to recent developments in cognitive behaviour theory. With approximately half of individuals treated with CBT-BN appearing to derive little or no benefit (Wilson et al., 2002) researchers have started to investigate the contribution of deeper level self-evaluative processes (Cooper et al., 1996) and highlight the importance of global core low self-esteem in maintaining BN (Fairburn et al., 2003). If global core low self-esteem is central in the maintenance of BN, then global explicit self-esteem measures should in theory adequately detect low self-esteem in individuals with BN.

However, as discussed previously the research findings are inconsistent and do not clearly support a relationship between levels of self-esteem and BN. Whilst it may be hypothesised then that global self-esteem

may not be central to the maintenance of BN, with recent theorists continuing to stress the importance of core low self-esteem in models of BN, it is perhaps more likely that the method of assessment is inadequate.

The methodological weaknesses of the studies investigating the relationship between levels of self-esteem and BN have been considered, and it appears that explicit self-report measures may be an inadequate form of assessment. Not only are explicit self-esteem measures subject to a number of self-presentational biases (Kernis et al., 1997), but also researchers have found that elements of self-esteem may operate implicitly (i.e. unconsciously) and measures now exist to assess implicit self-esteem. Measures of implicit cognitions are thought to assess associations between two concepts that are presumably activated without conscious awareness, and as such are believed to be free from response biases. The IAT in particular has adequate reliability and validity and therefore, may be entirely appropriate for use with individuals with BN, particularly given that these individuals may deny systems that reflect a sense of shame (Vartanian et al., 2004) and as such may not explicitly report certain aspects of self. Implicit measures of self-esteem therefore may be useful as they are presumably free from response biases, and may measure an element of self-esteem (implicit) not previously investigated in BN.

Investigations into implicit self-esteem may also be beneficial and entirely relevant in BN as preliminary research (although inconclusive) in other areas of psychology has shown that explicit and implicit self-esteem may operate in different ways and that implicit self-esteem may predict some behaviours that explicit self-esteem does not (e.g. Spalding & Hardin, 1999).

It is also hypothesised that high implicit self-esteem is more beneficial in defending against existential threats to self. Therefore, when considering BN, if threats to self-esteem (such as cultural idealisation of thinness and denigration of fatness that drive body dissatisfaction and weight loss attempts) are implicitly received and processed (Grover et al., 2003) then low implicit self-esteem may influence an individual's ability to cope with such threats (Arndt et al., 1997). Coupled with core low self-esteem, this may account for some individuals attempting to defend their self-esteem through dysfunctional strategies such as controlling eating, weight and shape, and subsequently developing BN. Furthermore, it has been found that females hold different implicit attitudes to males, which is interesting as BN appears to be predominantly a female disorder.

To conclude, explicit self-esteem may only present half the picture. Social psychologists have developed theories of implicit self-esteem (i.e. have identified that self-esteem operates at an implicit level as well as an explicit level) and tools have been developed to measure it. Having considered the research investigating implicit self-esteem, it would seem that extending this into the area of BN would be beneficial. Future research could investigate implicit self-esteem in individuals with BN, or indeed other eating disorders. This may provide a fuller understanding of the processes occurring in BN, in particular the automatic implicit processes involved in core self-evaluations (i.e. core low self-esteem). Also with research into self-esteem in BN providing inconsistent results, application of an implicit measure may yield additional information, thus then allowing for more accurate prediction of risk and treatment outcome. With core low self-esteem hypothesised as

central to recent models of BN and researchers suggesting that in order to improve outcome, self-esteem should be addressed directly (Geller et al., 1997; Yellowlees, 1997; News et al., 2003; Fairburn et al., 2003) it may be worthwhile to investigate changes in implicit self-esteem. It would be interesting to use the IAT as a pre and post test measure to investigate whether changes in implicit self-esteem occurred over the course of therapy in BN. Finally, with research investigating ways to improve implicit self-esteem alternative treatment approaches may be tested or developed.

References

- Agras, W. S., Crow, S. J., Halmi, K. A., Mitchell, G. T., & Kraemer, H. C. (2000a). Outcome predictors for the cognitive behavioural treatment of bulimia nervosa: data from a multisite study. *American Journal of Psychiatry*, *157*, 1302-1308.
- Agras, W. S., & Kirkley, B. G. (1986). Bulimia: Theories of etiology. In K. D. Brownell, and J. P. Foreyt (Eds.), *Handbook of Eating Disorders: Physiology, Psychology, and Treatment of Obesity, Anorexia, and Bulimia* (pp. 367-370). New York: Basic Books.
- Agras, W. S., Walsh, B. T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000b). A multi-centre comparison of cognitive behavioural therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry*, *57*, 459-466.
- Aidman, E. V. (1999). Measuring individual differences in implicit self-concept: initial validation of the self-apperception test. *Personality and Individual Differences*, *27*, 211-228.
- Allport, G. W. (1937). *Personality: A Psychological Interpretation*. New York: Holt, Rinehart & Winston.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Washington: DC. American Psychiatric Association.
- American Psychiatric Association. (2004). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Washington: DC. American Psychiatric Association Text Revision.

- Anderson, D. A., & Maloney, K. C. (2001). The efficacy of cognitive behavioural therapy on the core symptoms of bulimia nervosa. *Clinical Psychology Review, 21*, 971-988.
- Arndt, J., Greenberg, J., Pyszczynski, T., & Solomon, S. (1997). Subliminal exposure to death-related stimuli increases defense of the cultural worldview. *Psychological Science, 8*, 379-385.
- Baccus, J. R., Baldwin, M. W., & Packer, D. (2004). Increasing implicit self-esteem through classical conditioning. *Psychological Science, 15*(7), 498-502.
- Baell, W. K., & Wertheim, E. H. (1992). Predictors of outcome in the treatment of bulimia nervosa. *British Journal of Clinical Psychology, 31*, 330-332.
- Banse, R. (2001). Affective priming with liked and disliked persons: prime visibility determines congruency and incongruency effects. *Cognition and Emotion, 15*, 501-520.
- Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist, 54*, 462-479.
- Baumeister, R. F. (1998). The self. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of Social Psychology* (4th ed., pp. 680-740). New York: McGraw-Hill.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). The relation of threatened egotism to violence and aggression: the dark side of high self-esteem. *Psychological Review, 103*, 5-33.

- Bell, L. (2002). Does concurrent psychopathology at presentation influence response to treatment for bulimia nervosa? *Journal of Eating and Weight Disorders*, 7(3), 168-181.
- Beresin, E. V., Gordon, C., & Herzog, D. B. (1989). The process of recovering from anorexia nervosa. *Journal of the American Academy of Psychoanalysis*, 17, 103-130.
- Bernet, C. Z., Ingham, R. E., & Johnson, B. R. (1993). Self-esteem. In C. G. Costello (Ed.), *Symptoms of Depression* (pp. 141-159). New York: Wiley.
- Berscheid, E., Walster, E., & Bohmstedt, G. (1973). The happy American body: a survey report. *Psychology Today*, 7, 119-131.
- Blaine, B., & Crocker, J. (1993). Self-esteem and self-serving biases in reaction to positive and negative events: an integrative review. In R. F. Baumeister (Ed.), *Self-esteem: The Puzzle of Low Self-regard* (pp. 55-85). Hillsdale, NJ: Erlbaum.
- Blair, I. V. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review*, 6, 242-261.
- Blouin, A. G., Zuro, C., & Blouin, J. H. (1990). Family environment in bulimia nervosa: The role of depression. *International Journal of Eating Disorders*, 9, 649-658.
- Bosson, J. K. (2003). Discrepant explicit and implicit self-esteem: relations to self and friend ratings of personality and physical health. Unpublished manuscript. University of Texas, Austin.
- Bosson, J. K., Swann, W. B., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: the blind men and the

elephant revisited? *Journal of Personality and Social Psychology*, *79*, 631-643.

Button, E. J., Songuga-Barke, E. J. S., Davies, J., & Thompson, M. (1996). A prospective study of self-esteem in the prediction of eating problems in adolescent schoolgirls: questionnaire findings. *British Journal of Clinical Psychology*, *35*, 193-203.

Cash, T. F. (1990). The psychology of physical appearance: aesthetics, attributes, and images. In T. F. Cash & T. Pruzunsky (Eds.), *Body Images: Development, deviance and change* (pp. 51-79). New York: Guilford Press.

Colvin, C. R., Block, J., & Funder, D. C. (1995). Overly positive self-evaluations and personality: negative implications for mental health. *Journal of Personality and Social Psychology*, *68*, 1152-1162.

Cooper, M. J., & Fairburn, C. G. (1993). Confusion over the core psychopathology of bulimia nervosa. *International Journal of Eating Disorders*, *13*, 385-389.

Cooper, M. J., & Todd, G. (1997). Selective processing of three types of stimuli in eating disorders. *British Journal of Clinical Psychology*, *36*, 895-898.

Cooper, M. J., Todd, G., & Cohen-Tovee, E. (1996). Core beliefs in eating disorders. *International Cognitive Therapy Newsletter*, *10*(2), 2-3.

Cooper, M. J., Todd, G., & Wells, A. (1998). Content, origins, and consequences of dysfunctional beliefs in anorexia nervosa and bulimia nervosa. *Journal of Cognitive Psychotherapy*, *12*, 213-230.

- Cooper, M. J., & Turner, H. (2000). Underlying assumptions and core beliefs in anorexia nervosa and dieting. *British Journal of Clinical Psychology, 39*, 215-218.
- Cooper, M. J., Wells, A., & Todd, G. (2004). A cognitive theory of bulimia nervosa. *British Journal of Clinical Psychology, 43*, 1-16.
- Crocker, J., Thompson, L., McGraw, K., & Ingerman, C. (1987). Downward comparison, prejudice and evaluations of others: effects of self-esteem and threat. *Journal of Personality and Social Psychology, 52*, 907-916.
- Dasgupta, N., McGhee, D. E., Greenwald, A. G., & Banaji, M. R. (2000). Automatic preference for white Americans eliminating the familiarity explanation. *Journal of Experimental Social Psychology, 36*, 316-328.
- Davis, R., Olmstead, M. P., & Rockert, W. (1992). Brief group psycho-education for bulimia nervosa II: prediction of clinical outcome. *International Journal of Eating Disorders, 11*, 205-211.
- Davis, R., McVey, G., Heinman, M., Rockert, W., & Kennedy, S. (1999). Sequencing of cognitive behavioural treatments of bulimia nervosa. *International Journal of Eating Disorders, 25*, 361-374.
- De Houwer, J. (2003). The extrinsic affective Simon task. *Experimental Psychology, 50*(2), 77-85.
- Devine, P. G. (1989). Stereotypes and prejudice: their automatic and controlled components. *Journal of Personality and Social Psychology, 56*(1), 5-18.

- Devos, T., & Banaji, M. R. (2003). Implicit self and identity. In M. R. Leary & J. P. Tangey (Eds.), *Handbook of Self and Identity* (pp.153-175). New York: Guilford.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*, 542-575.
- Dion, K. K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, *24*, 285-290.
- Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the nature of prejudice: automatic and controlled processes. *Journal of Experimental Social Psychology*, *33*, 510-540.
- Eagly, A. H., Ashmore, R. D., Makhijana, M. G., & Longo, L. C. (1991). What is beautiful is good but...: a meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, *110*, 109-128.
- Fairburn, C. G. (1981). A cognitive behavioural approach to the management of bulimia. *Psychological Medicine*, *11*, 697-706.
- Fairburn, C. G. (1985). Cognitive behavioural treatment for bulimia. In D. M. Garner, & P. E. Garfinkel (Eds.), *Handbook of Psychotherapy for Anorexia Nervosa and Bulimia* (pp. 160-192). New York: Guilford Press.
- Fairburn, C. G. (1986). Cognitive behaviour therapy for bulimia nervosa. *British Review of Bulimia and Anorexia Nervosa*, *1*(1), 13-18.
- Fairburn, C. G., & Cooper, P. J. (1997). Eating disorders. In K. Hawton, P. M. Salkovskis, J. Kirk, & D. M. Clark (Eds.), *Cognitive Behaviour Therapy for Psychiatric Problems* (pp. 277-314). Oxford: Oxford University Press.

- Fairburn, C. G., Cooper, Z., Doll, H. A., & Welch, S. L. (1999). Risk factors for anorexia nervosa: Three integrated case-control comparisons. *Archives of General Psychiatry*, *56*, 468-476.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A transdiagnostic theory and treatment. *Behaviour Research and Therapy*, *41*, 509-528.
- Fairburn, C. G., Kirk, J., O'Connor, M., Anastasiades, P., & Cooper, P. J. (1987). Prognostic factors in bulimia nervosa. *British Journal of Clinical Psychology*, *26*, 223-224.
- Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993b). cognitive behavioural therapy for binge-eating and bulimia nervosa: a comprehensive treatment manual. In C. G. Fairburn, & G. T. Wilson (Eds.), *Binge Eating: Nature, Assessment and Treatment* (pp. 361-404). New York: Guilford Press.
- Fairburn, C. G., Norman, P. A., Welch, S. L., O'Connor, M. E., Doll, H. A., & Peveler, R. C. (1995). A prospective study of outcome in bulimia nervosa and the long term effects of three psychological treatments. *Archives of General Psychiatry*, *52*, 304-312.
- Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993a). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology*, *61*, 696-698.
- Fairburn, C. G., Shafran, R., & Cooper, Z. (1999). A cognitive behavioural theory of eating disorders. *Behaviour Research and Therapy*, *37*, 1-13.

- Fairburn, C. G., Welch, S. L., Doll, H. A., Davies, B. A., & O'Connor, M. F. (1997). Risk factors for bulimia nervosa: a community based case-control study. *Archives of General Psychiatry*, *54*, 509-517.
- Fallon, P., Katzman, M. A., & Wooley, S. C. (1994). *Feminist Perspectives on Eating Disorders*. New York: Guilford Press.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: their meaning and uses. *Annual Review of Psychology*, *54*, 297-327.
- Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, *50*, 229-238.
- Feingold, A. (1992). Good looking people are not what we think. *Psychological Bulletin*, *111*, 304-341.
- Feldman, W., Feldman, E., & Goodman, J. T. (1998). Culture vs. biology: children's attitude towards thinness and fatness. *Pediatrics*, *81*, 190-194.
- Fernald, A. (1993). Approval and disapproval: implicit responsiveness to vocal affect in familiar and unfamiliar languages. *Child Development*, *64*, 657-674.
- Fredrickson, B. L., & Roberts, T. (1997). Objectification theory: toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*, 173-206.
- Freeman, C. P., Sinclair, E., Turnbull, J., Annandale, A. (1985). Psychotherapy for bulimia: a controlled study. *Journal of Psychiatric Research*, *19*, 473-478.

- Frings, C. G., & Wentura, D. (2003). Who is watching big brother? TV consumption predicted by masked affective priming. *European Journal of Social Psychology, 33*, 779-791.
- Garner, D. M., & Garner, M. Y. (1986). Self-concept deficiencies in eating disorders. In L. M. Hartman & K. R. Blankstein (Eds.), *Perception of Self in Emotional Disorder and Psychotherapy* (pp. 133-156). New York. Plenum Press.
- Garner, D. M., Olmsted, M. P., Davis, R., Rockert, W., Goldbloom, D. & Eagle, M. (1990). The association between bulimic symptoms and reported psychopathology. *International Journal of Eating Disorders, 9*, 1-15.
- Garner, D. M., Rockert, W., Davis, R., Garner, M. V., Olmstead, M. P., & Eagle, M. (1993). Comparison of cognitive-behavioral and supportive-expressive therapy for bulimia nervosa. *American Journal of Psychiatry, 150*, 37-46.
- Geller, J., Johnston, C., & Madsen, K. (1997). The role of shape and weight in self-concept-the shape and weight based self-esteem inventory. *Cognitive Therapy and Research, 21*, 5-24.
- Geller, J., Johnston, C., Madsen, K., Goldner, E. M., Remick, R. A., & Birmingham, C. L. (1998). Shape and weight based self-esteem and the eating disorders. *International Journal of Eating Disorders, 24*, 285-298.
- Gharderi, A., & Scott, B. (2001). Prevalence, incidence and prospective risk factors for eating disorders. *Acta Psychiatrica Scandinavica, 104*, 122-130.

- Goldenberg, J. L., McCoy, S. K., Greenberg, J., Pyszczynski, T., & Solomon, S. (2000). The body as a source of self-esteem: the effect of morality salience on identification with one's body, interest in sex, and appearance monitoring. *Journal of Personality and Social Psychology*, *79*, 118-130.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem and stereotypes. *Psychological Review*, *102*, 4-27.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*, 1022-1038.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology*, *74*, 1464-1480.
- Grillo, C. M., Devlin, M. J., Cachelin, F. M., & Yanovski, S. Z. (1997). Report of the National Institutes of Health (NIH) workshop on the development of research priorities in eating disorders. *Psychopharmacology Bulletin*, *33*, 321-333.
- Grover, V. P., Keel, P. M., & Mitchell, J. P. (2003). Gender differences in implicit weight identity. *International Journal of Eating Disorders*, *34*, 125-135.
- Haaga, D. A. F., Dyck, M. J., & Ernst, D. (1991). Empirical status of cognitive theory of depression. *Psychological Bulletin*, *110*, 215-236.
- Hall, A., & Hay, P. J. (2001). Eating disorder patient referrals from a population region. 1977-1986. *Psychological Medicine*, *21*(3), 697-701.

- Hesse-Biber, S., & Marino, M. (1990). From high school to college: Changes in women's self-concept and its relationship to eating problems. *Journal of Psychology, 125*, 199-216.
- Hetts, J. J., & Pelham, B. W. (2002). A case for the non-conscious self-concept. In G. Moskowitz (Ed.), *Cognitive Social Psychology: The Princeton Symposium on the Legacy and Future of Social Cognition* (pp. 105-123). Mahwah, NJ: Erlbaum.
- Hetts, J. J., Sakuma, M., & Pelham, B. W., (1999). Two roads to positive regard: implicit and explicit self-evaluation and culture. *Journal of Experimental Social Psychology, 35*, 512-559.
- Hoek, H. W., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorders. *International journal of Eating Disorders, 34*, 383-396.
- Hsu, L., Crisp, A. H., & Callender, J. S. (1992). Recovery in anorexia nervosa: the patient's perspective. *International Journal of Eating Disorders, 11*, 341-350.
- Jacobi, C., Hayward, C., de Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin, 130*(1), 19-65.
- Jacobi, C., Thomas, P., de Zwaan, M., Nutzinger, D. O., & Dahme, B. (2002). Specificity of self-concept disturbances in eating disorders. *International Journal of Eating Disorders, 35*, 204-210.
- James, W. (1890). *The Principles of Psychology*. New York: Holt.

- Joiner, T. E., Heatherton, T. F., & Keele, P. K. (1997). Ten year stability and predictive validity of five bulimia-related indicators. *American Journal of Psychiatry, 154*(8), 1133-1138.
- Jones, J. T., Pelham, B. W., Mirenberg, M. C., & Hetts, J. J. (2002). Name letter preferences are not merely mere exposure: implicit egotism as self-regulation. *Journal of Experimental Social Psychology, 38*, 170-177.
- Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology, 85*(5), 969-978.
- Karpinski, A., & Hilton, J. L. (2001). Attitudes and the implicit associations test. *Journal of Personality and Social Psychology, 81*, 774-788.
- Keel, P. K., & Mitchel, J. E. (1997). Outcome in bulimia nervosa. *American Journal of Psychiatry, 154*(3), 313-321.
- Kernis, M. H., Abend, T. A., Goldman, B. M., Shrira, I., Paradise, A. N., & Hampton, C. (2005). Self-serving responses arising from discrepancies between explicit and implicit self-esteem. *Self and Identity, 4*, 311-330.
- Kernis, M. H., Greenier, K. D., Herlocker, C. E., Whisenhunt, C. R., & Abend, T. A. (1997). Self-perceptions of reactions to doing well or poorly: the roles of stability and level of self-esteem. *Personality and Individual Differences, 22*, 845-854.
- Kernis, M. H., Paradis, A. W., Whitaker, D. J., Wheatman, S. R., & Goldman, B. N. (2000). Master of one's psychological domain? Not likely if one's

- self-esteem is unstable. *Personality and Social Psychology Bulletin*, 26, 1297-1305.
- Kilhstrom, J. F. (1999). The discovery of the unconscious. Paper presented at the meeting of the Australian Psychological Society, Hobart, Tasmania.
- Kilhstrom, J. F., & Cantor, N. (1984). Mental representations of the self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 17, pp. 1-47). Orlando, FL: Academic.
- Koole, S. L., Dijksterhuis, A., & van Knippenberg, A. (2001). What's in a name: implicit self-esteem and the automatic self. *Journal of Personality and Social Psychology*, 80, 669-685.
- Koole, S. L., Smeets, K., van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology*, 77, 111-125.
- Loeb, K. L., Wilson, G. T., Gilbert, J. S., Laubovie, E. (2000). Guided and unguided self-help for binge-eating. *Behaviour Research and Therapy*, 38, 259-272.
- Marlowe, C. M., Schneider, S. L., & Nelson, C. E. (1996). Gender and attractiveness biases in hiring decisions: are more experienced managers less biased? *Journal of Applied Psychology*, 81, 11-21.
- McClelland, D. C., Koestner, R., & Weinberger, J. (1989). How do self-attributed implicit motives differ? *Psychological Review*, 96, 690-702.
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale. *Psychology of Women Quarterly*, 20, 181-215.

- Meijboom, A., Jensen, A., Kampman, M., & Schouten, E. (1999). An experimental test of the relationship between self-esteem and concern about body shape and weight in restrained eaters. *International Journal of Eating Disorders, 25*, 327-334.
- Mirkin, M. P. (1990). Eating disorders: A feminist family therapy perspective. In M. P. Mirkin (Ed.), *The Social and Political Context of Family Therapy* (pp. 89-119). MA, US: Allyn and Bacon.
- Morry, M. M., & Staska, S. L. (2001). Magazine exposure: internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science, 33*, 269-279.
- National Collaborating Centre for Mental Health (2004). *Eating Disorders. Core Interventions in the Treatment and Management of Anorexia Nervosa, Bulimia Nervosa and Related Eating Disorders*. British Psychological Society and Royal College of Psychiatrists.
- Newns, K., Bell, L., & Thomas, S. (2003). The impact of a self-esteem group people with eating disorders: an uncontrolled study. *Clinical Psychology and Psychotherapy, 10*, 64-68.
- Nosek, B. A., & Banaji, M. R. (2001). The go/no-go associations task. *Social Cognition, 19*, 625-666.
- Nussbaum, M. P. (1992). Nutritional concerns. In L. Bralow (Ed.), *Textbook of Adolescent Medicine* (pp. 536-541). Saunders. Philadelphia.
- Orne, M. T. (1962). On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. *American Psychologist, 17*, 776-783.

- Pelham, B. W., Mirenberg, M. C., & Jones, J. J. (2002). Why Susie sells seashells by the seashore: implicit egotism and major life decisions. *Journal of Personality and Social Psychology, 82*, 469-487.
- Perugini, M. (2005). Predictive models of implicit and explicit attitudes. *British Journal of Social Psychology, 44*, 29-45.
- Peterson, G., & Rosenvinge, J. H., (2002). Improvement and recovery from eating disorders: A patient perspective. *Eating Disorders, 10*(1), 61-72.
- Polivy, J., & Herman, C. P. (1993). Etiology of binge eating: psychological mechanisms. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge Eating: Nature, Assessment and Treatment* (pp. 173-205). New York: Guilford Press.
- Pyszcznski, T., Greenberg, J., Solomon, S., Arndt, J., & Schimel, J. (2004). Why do people need self-esteem? A theoretical and empirical review. *Psychological Bulletin, 130*(3), 435-468.
- Ritts, V., Patterson, M. L., & Tubbs, M. E. (1992). Expectations, impressions, and judgements of physical attractive students: a review. *Review of Educational Research, 62*, 413-426.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: construct validation of a single-item measure and the Rosenberg Self-esteem Scale. *Personality and Social Psychology Bulletin, 27*, 151-161.
- Robson, P. (1989). Development of a new self report questionnaire designed to measure self-esteem, *Psychological Medicine, 19*, 513-518.
- Roefs, A., & Jansen, A. (2002). Implicit and explicit attitudes to high fat foods in obesity. *Journal of Abnormal Psychology, 111*(3), 517-521.

- Rogers, C. (1951). *Client Centered Therapy*. Boston: Houghton Mifflin.
- Rorty, M., Yager, J., & Rossotto, E. (1993). Why and how do women recover from bulimia nervosa? The subjective appraisals of forty women recovered for a year or more. *International Journal of Eating Disorders, 14*, 249-260.
- Rosenberg, M. (1965). *Society and Adolescent Self-image*. Princeton: Princeton University Press.
- Rosenberg, M. (1969). The conditions and consequences of evaluation apprehension. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in Behavioral Research* (pp. 279-349). New York: Academic Press.
- Rosenberg, M. (1979). *Conceiving the Self*. New York: Basic books.
- Ross, M., & Wade, T. D. (2004). Shape and weight concern and self-esteem as mediators of externalized self-perception, dietary restraint and uncontrolled eating. *European Eating Disorders Review, 12*, 129-136.
- Rudman, L. A., Greenwald, A. G., McGhee, D. E. (2001b) Implicit self-concept and evaluative implicit gender stereotypes: self and ingroup share desirable traits. *Personality and Social Psychology Bulletin, 27*, 1164-1178.
- Rudman, L. A., Greenwald, A. G., Mellott, D. S., & Schwartz, J. L. K. (1999). Measuring the automatic components of prejudice: flexibility and generability of the implicit associations test. *Social Cognition, 17*, 437-465.
- Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, to thine own

- self be better. In M. P. Zanna (Ed.), *Advances in Experimental Psychology* (Vol. 29, pp. 209-269). New York. Academic Press.
- Silverstone, P. H. (1990). Low self-esteem in eating disordered patients in absence of depression. *Psychological Reports*, *67*, 276-278.
- Silverstone, P. H. (1992). Is chronic low self-esteem the cause of eating disorders? *Medical Hypothesis*, *39*, 311-315.
- Singh, D., & Young, R. K. (1995). Body weight, waist to hip ratio, breasts and hips: role in judgements of female attractiveness and desirability for relationships. *Ethology and Sociobiology*, *16*, 483-507.
- Slade, P. D. (1982). Towards a functional analysis of anorexia nervosa and bulimia nervosa. *British Journal of Clinical Psychology*, *21*, 167-179.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behaviour: the psychological functions of self-esteem and cultural worldviews. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (pp. 91-159). San Diego: Academic Press.
- Spalding, L. R., & Hardin, C. D. (1999). Unconscious unease and self-handicapping: behavioural consequences of individual differences in implicit and explicit self-esteem. *Psychological Science*, *10*, 535-539.
- Steiger, H., Young, S. N., Ng Ying Kin, N. M. K., Koerner, N., Israel, M., Lageix, P., et al. (2001). Implications of impulsive and affective symptoms for serotonin function in bulimia nervosa. *Psychological Medicine*, *31*, 85-95.

- Stice, E. (2001). A prospective test of the dual-pathway model of bulimic pathology: Mediating effects of dieting and negative affect. *Journal of Abnormal Psychology, 110*, 124-135.
- Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist, 41*, 246-263.
- Strober, M. (1986). Anorexia nervosa: History and psychological concepts. In K. D. Brownell, and J. P. Foreyt. (Eds.), *Handbook of Eating Disorders: Physiology, Psychology, and Treatment of Obesity, Anorexia, and Bulimia* (pp. 231-246). Basic Books. New York.
- Tafarodi, R. W., & Swann, W. B. (1995). Self-liking and self-competence as dimensions of global self-esteem: initial validation of a measure. *Journal of Personality Assessment, 65*, 322-342.
- Tedeschi, J. T., Schlenker, B. R., Bonoma, T. V. (1971). Cognitive dissonance: private ratiocination or public spectacle? *American Psychologist, 26*, 685-695.
- Tennen, H., & Affleck, G. (1993). The puzzles of self-esteem: a clinical perspective. In R. F. Baumeister (Ed.), *Self-esteem: The Puzzle of Low Self-regard* (pp. 241-262). New York: Plenum Press.
- Thackwray, D. E., Smith, M. C., Bodfish, J. W., & Meyers, A. W. (1993). A comparison of behavioural and cognitive behavioural interventions for bulimia nervosa. *Journal of Consulting and Clinical Psychology, 61*(4), 639-645.

- Troop, N. A., Schmidt, U. H., Turnbull, S. J., & Treasure, J. L. (2000). Self-esteem and responsibility for change in recovery from bulimia nervosa. *European Eating Disorders Review*, *8*(5), 384-393.
- Turnbull, S. J., Schmidt, U. H., Troop, N. A., Tiller, J. M., Todd, G., & Treasure, J. L. (1997). Predictors of outcome for two treatments for bulimia nervosa: short and long term. *International Journal of Eating Disorders*, *21*, 17-22.
- Vartanian, L. R., Polivy, J., & Herman, C. P. (2004). Implicit cognitions and eating disorders: their application in research and treatment. *Cognitive and Behavioral Practice*, *11*, 160-167.
- Vaz, F. L. (1998). Outcome of bulimia nervosa: prognostic indicators. *Journal of Psychosomatic Research*, *45*(5), 391-400.
- Vitousek, K. M. (1996). The current status of cognitive-behavioural models of anorexia nervosa and bulimia nervosa. In P. M. Salkovskis (Ed.), *Frontiers of Cognitive Therapy* (pp. 383-418). New York, US: Guilford Press.
- Vitousek, K. M., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research*, *14*, 191-214.
- Vohs, K. D., Bardone, A. M., Joiner, & Abramson, L. Y. (1999). Perfectionism, perceived weight status, and self-esteem interact to predict bulimic symptoms: a model of bulimic symptom development. *Journal of Abnormal Psychology*, *108*(4), 695-700.

- Waller, G., Ohanian, V., Meyer, C., & Osman, S. (2000). Cognitive content among bulimic women; the role of core beliefs. *International Journal of Eating Disorders*, 28, 235-241.
- Weber, S. J., & Cook, T. D. (1972). Subject effects in laboratory research: an examination of subject roles, demand characteristics, and valid inference. *Psychological Bulletin*, 77, 273-295.
- Wiederman, M. W., & Pryor, T. L. (1999). Body dissatisfaction and depression among women: the mediating role of drive for thinness. *International Journal of Eating Disorders*, 27(1), 90-95
- Weiss, S., & Ebert, M. H. (1983). Psychological and behavioral characteristics of normal-weight bulimics and normal weight controls. *Psychosomatic Medicine*, 45, 293-303.
- Wilfley, D. E., & Cohen, L. R. (1997). Psychological treatment of bulimia nervosa and binge eating disorder. *Psychopharmacology Bulletin*, 33, 437-454.
- Wilson, G. T. (1999). Cognitive behaviour therapy for eating disorders: Process and problems. *Behaviour, Research and Therapy*, 37(1), 79-95.
- Wilson, G. T., & Fairburn, C. G. (1998). Treatments for eating disorders. In P. E. Nathan & J. M. Gordon (Eds.), *Treatments that Work* (pp. 501-530). New York: Oxford University Press.
- Wilson, G. T., Fairburn, C. G., Agras, W. S. (1997). Cognitive behaviour therapy for bulimia nervosa. In D. M. Garner & P. E. Garfinkel (Eds.), *Handbook of Treatment for Eating Disorders* (pp. 67-93). New York: Guilford Press.

- Wilson, G. T., Fairburn, C. C., Agras, W. S., Walsh, B. T., & Kraemer, H. (2002). Cognitive behavioural therapy for bulimia nervosa: time course and mechanisms of change. *Journal of Consulting and Clinical Psychology, 70*(2), 267-274.
- Wilson, T. D., Lindsay, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*, 101-126.
- Wood, A., Waller, G., & Gowers, S. (1994). Predictors of eating pathology in adolescent girls. *European Eating Disorders Review, 2*, 6-13.
- Woodside, D. B. (1995). A review of anorexia nervosa and bulimia nervosa. *Current Problems in Pediatrics, 25*, 67-89.
- Yellowlees, A. (1997). *Working with Eating Disorders and Self-esteem*. Folens Limited: Dunstable and Dublin.
- Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: implications for narcissism and self-esteem instability. *Journal of Personality, 74*(1), 119-143.

IMPLICIT SELF-ESTEEM IN EATING DISORDERS

Running Head: Implicit Self-Esteem in Eating Disorders

Elaine S. Cockerham

Prepared for submission to the International Journal of Eating Disorders

Correspondence regarding this article should be addressed to:

Elaine S. Cockerham, Doctorate Programme in Clinical Psychology, (34
Bassett Crescent East), School of Psychology, University of Southampton,
Hants, SO17 1BJ, esc203@soton.ac.uk.

Abstract

Objective: The aims of the study were to investigate whether individuals with eating disorders had a less positive implicit self-esteem bias and lower levels of explicit self-esteem compared to individuals without eating disorders.

Method: There were two groups of female participants; one with an eating disorder (Bulimia Nervosa or Binge Eating Disorder: $n = 20$) and a healthy control group ($n = 20$). They completed a self-esteem version of the Implicit Association Test (IAT: Greenwald, McGhee, & Schwartz, 1998; Greenwald & Farnham, 2000) in order to compare implicit self-esteem biases. Participants also completed the Rosenberg Self-Esteem inventory (RSE: Rosenberg, 1965) and the Shape And Weight Based Self-esteem inventory (SAWBS; Geller, Johnston, & Madsen, 1997) to compare differences in explicit self-esteem. Speed (reaction time), depression, social anxiety, and perfectionism were measured and controlled for as covariants.

Results: There were significant differences between the groups on both the explicit (RSE and SAWBS) and implicit (IAT) measures. Individuals with eating disorders reported lower levels of explicit self-esteem, but had higher levels of implicit self-esteem (IAT-D effect scores) than healthy controls.

Conclusion: The results are discussed in relation to other research that has found a positive implicit self-esteem bias in clinical populations and considers the discrepancies found between implicit and explicit measures of self-esteem. The clinical implications of the results are also considered.

KEYWORDS: *Implicit self-esteem, explicit self-esteem, bulimia nervosa, eating disorders, cognitive behavioural model.*

Introduction

Cognitive behavioural models of Bulimia Nervosa (BN) focus on the centrality of overvalued ideas about body, weight, and shape to which the initiation and maintenance of bulimic symptomology are attributed (Vitousek & Hollon, 1990; Cooper & Fairburn, 1993; Vitousek, 1996; Fairburn & Cooper, 1997). This model suggests that BN occurs in a context where low self-esteem becomes linked with weight and shape concerns, which in turn become linked with self-worth. The model posits that low self-esteem is the most important risk factor for developing overvalued ideas about body, weight, and appearance (Meijboom, Jensen, Kampman, & Schouten, 1999).

Most recently, theorists emphasise the role of deeper level cognitions, which by nature may not be accessible to conscious reflection (Cooper, Todd, & Cohen-Tovee, 1996; Cooper & Todd, 1997; Cooper, Todd, & Wells, 1998; Waller, Ohanian, Meyer, & Osman, 2000; Cooper, Wells, & Todd, 2004), and suggest that the impact of unconditional and pervasive (global core) low self-esteem is central to the maintenance of BN (Fairburn, Cooper, & Shafran, 2003). Thus, rather than thinking negatively about themselves as a result of their inability to control their eating, weight, and shape, some individuals may have global negative views about themselves that are seen as part of their permanent identity. This may obstruct change in some individuals through two mechanisms. First, it may create feelings of hopelessness about the individual's capacity to change, thereby undermining compliance with treatment. Second, global core low self-esteem could result in individuals pursuing highly valued goals with particular determination, such as, the pursuit of control over eating, weight, and shape. A further important

point is that the negative self-evaluative state is thought to be self-perpetuating as these individuals show pronounced negative cognitive processing biases, combined with over-generalisation. They may therefore perceive any failure as confirmation that they themselves are failures, thereby reaffirming their overall negative self-view (Fairburn et al., 2003).

If self-esteem acts centrally in the cycle perpetuating eating disorder symptoms, treatment outcome should improve if self-esteem is directly addressed (Yellowlees, 1997; Fairburn et al., 2003) and there is some evidence to support this idea. In a study without a comparison control group, a group aimed at raising self-esteem for individuals with eating disorders greatly improved symptoms of self-esteem, depression and eating attitudes (Newns, Bell, & Thomas, 2003). Other studies have also found that raising self-esteem helps maintain change following treatment (Beresin, Gordan, & Herzog, 1989; Hsu, Crisp, & Callender, 1992; Rorty, Yager, & Rossotto, 1993; Petersen & Rosenvinge, 2002) and that raising self-esteem can enhance recovery from BN. For example, those who responded poorly to treatment had lower levels of self-esteem than those who responded well (Fairburn, Kirk, O'Connor, & Anastasides, 1987; Baell & Weirtheim, 1992; Fairburn, Peveler, Jones, Hope, & Doll, 1993a).

Despite these findings, the existing evidence that has attempted to establish and predict the likelihood of developing and recovering from BN by measuring self-esteem has produced inconsistent findings. Although a number of studies have found that individuals with eating disorders have lower levels of self-esteem than healthy controls (Freeman, Sinclair, Turnbull, & Annandale, 1985; Baell & Wertheim, 1992; Garner, Rockert, Davis, Garner,

Olmstead, & Eagle, 1993; Fairburn, Welch, Doll, Davies, & O'Connor, 1997; Davis, McVey, Heinman, Rockert, & Kennedy, 1999), there are a number of limitations to these studies. First, they did not control for symptoms of depression. Depression and self-esteem are highly correlated (Haaga, Dyck, & Ernst, 1991; Bernet, Ingham, & Johnson, 1993) and therefore these studies may be confounded by depressive symptomology. Second, these studies generally consider self-esteem before and after treatment. Only a few studies investigate the long term effects of low self-esteem in the maintenance and relapse of eating disorders (Troop, Schmidt, Turnbull, & Treasure, 2000). As a result, little is known about how self-esteem may change over the course of the disorder. Finally, it is also unclear whether self-esteem issues pre-date BN or are a consequence or symptom of BN. Symptoms of low self-esteem have been found to pre-date the onset of the eating disorder (Fairburn et al., 1997), however, self-esteem was only assessed retrospectively.

A number of studies have also failed to find a relationship between low levels of self-esteem and BN (Garner, Olmsted, Davis, Rockert, Goldbloom, & Eagle, 1990; Davis, Olmsted, & Rockert, 1992; Turnbull, Schmidt, Troop, Tiller, Todd, & Treasure, 1997; Bell, 2002). As a consequence, self-esteem is not listed as a primary predictor of outcome for treatment of BN in the current NICE guidelines (National Institute of Clinical Excellence: National Collaborating Centre for Mental Health, 2004).

Although these inconsistencies exist in the research literature, low self-esteem remains central to current models of BN, and therefore researchers have started to develop and use specific weight and shape related self-esteem measures, such as the Shape And Weight Based Self-

esteem inventory (SAWBS; Geller, Johnston, & Madsen, 1997) rather than global self-esteem measures. The SAWBS is better at distinguishing individuals with eating disorders from those without (Geller, Johnston, Madsen, Goldner, Remick, & Birmingham, 1998) than global self-esteem self-report questionnaires. However, this is inconsistent with recent theories that emphasise the importance of deeper level cognitions (such as global core low self-esteem) in the development and maintenance of BN. If self-esteem in BN involves core global self-evaluations, then in theory, global measures should be able to detect these differences.

A further limitation of the measurement of self-esteem in eating disorders to date is that, regardless of the type of self-esteem measure used (global or weight and shape specific), they rely on explicit self-report questionnaires. Such self-report measures have been criticised because they rely on the individual to explicitly report feelings about themselves and as such are thought to be subject to a number of self-enhancing and self-presentational biases (Rosenberg, 1969; Weber & Cook, 1972; Kernis, Greenier, Herlocker, Whisenhunt, & Abend, 1997; Aidman, 1999; Kernis, Paradise, Whitaker, Wheatmen, & Goldman, 2000). Furthermore, in social psychology, theoretical developments suggest that self-esteem operates not just at an explicit level but also at an implicit level. Implicit evaluations of the self are thought to occur unintentionally and without conscious awareness, whereas explicit evaluations are thought to be subject to conscious reflection (e.g. Greenwald & Banaji, 1995). If self-esteem in BN is now thought to be related to deeper level cognitions, which by their very nature may not be consciously accessible (Beck, Rush, Shaw, & Emery, 1979), then implicit

self-esteem measures should be included in any study of self-esteem in eating disorders.

Implicit self-esteem has been defined as an automatic evaluation of the self (Greenwald & Banaji, 1995), and a number of tools have been developed that measure self-evaluations indirectly. The most widely used measure is the Implicit Associations Test (IAT; Greenwald, McGhee, & Schwartz, 1998), which has reasonable reliability and validity (Bosson, Swann, & Pennebaker, 2000). The IAT was originally designed to measure implicit associations between concepts, such as flowers and insects, with certain attributes, such as pleasant and unpleasant words. It was later adapted to measure self-esteem (Greenwald & Farnham, 2000) using the concepts of 'self' (e.g. me) and 'other' (e.g. them), which were paired with positive (e.g. love) and negative (e.g. ugly) words. The idea behind the IAT is that it should be easier for individuals to respond when the two concepts that share a response key are congruent (e.g. self and positive or flowers and pleasant words), because these concepts are cognitively related in memory. By comparison, it should be harder to respond when the two concepts that share a response key are incongruent (e.g. self and negative or flowers and unpleasant words), because they are not cognitively related in memory.

Within healthy populations a large body of evidence demonstrates that individuals display a positive implicit self-esteem bias (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellot, 2002). The IAT has now been adapted by clinical researchers to investigate beliefs in different types of psychopathology (see De Houwer, 2002 for a review), where a negative implicit bias might be expected. However, although in some cases group

differences have been found, implicit self-evaluation appears to remain positive, albeit reduced, in certain psychopathological states or conditions. For example, after a negative mood induction, the implicit bias of formerly depressed patients decreased more than in a control group of never depressed individuals (Gemar, Segal, Sagrati, & Kennedy, 2001). A lower implicit self-esteem bias has also been found amongst high socially anxious individuals compared with low socially anxious individuals (de Jong, 2002; Tanner, Stopa, & DeHouwer, 2005).

Low implicit self-esteem can have negative consequences for the self. Individuals with lower levels of implicit self-esteem showed diminished levels of aspiration after a failure manipulation (Greenwald & Farnham, 2000) and more anxiety during a personal interview (Spalding & Hardin, 1999) than individuals with more positive implicit self-esteem. Therefore, detecting reduced implicit self-esteem biases may help predict certain behaviours.

The literature also reveals a puzzling finding, which is that implicit and explicit self-esteem do not seem to correlate very highly (Spalding & Hardin, 1999; Bosson et al., 2000; Greenwald & Farnham, 2000; Bosson, 2003; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003). Therefore, rather than being part of the same system that can be measured in different ways, implicit and explicit self-esteem may actually be distinct processes that operate in different ways. Thus, measuring explicit self-esteem (i.e. using self-report measures) may actually provide no information about implicit self-esteem.

Finally, the discrepancies found between explicit and implicit measures of self-esteem are thought to be important as they may

differentiate between secure and fragile forms of self-esteem (Kernis, 2003; Jordan et al., 2003; Kernis, Abend, Goldman, Shrira, Paradise, & Hampton, 2005; Zeigler-Hill, 2006). Rather than suggesting that implicit and explicit measures of self-esteem should or should not correlate, the discrepancies found between them have been associated with a number of negative behaviours, for example paranoia (Bentall, Kinderman, & Kaney, 1994), defensiveness and narcissism (Jordan et al., 2003), which are known to be associated with certain psychopathological conditions. Therefore, once again, measuring self-esteem using both explicit and implicit tools may provide more complete and detailed information and may identify those at risk of developing certain psychopathologies.

In summary, although there are contradictory research findings on the relationship between levels of self-esteem and behaviours associated with BN, current cognitive behavioural models of BN continue to emphasize the key role of self-esteem in the development and maintenance of the disorder. Indeed the role of deeper level cognitions (i.e. core and dysfunctional beliefs) are generally accepted by cognitive theorists as crucial in the development of certain psychopathologies (e.g. Beck, 1976) and core global negative self-evaluations are thought to be central to the maintenance of BN (Fairburn et al., 2003). Deeper level cognitions are often described as implicit in the sense that individuals may be unaware that they have them or because they can influence behaviour in an automatic manner, and as such, may require access through implicit measures. Explicit attitudes, on the other hand, are thought to involve conscious beliefs, which as a result, are subject to self-presentational strategies. Research also exists to suggest that self-esteem

may operate through two distinct systems (implicit and explicit) and therefore, continuing to measure self-esteem using only explicit measures may provide inaccurate information or at least only partial information about the role of self-esteem in BN. With research developing to investigate implicit self-esteem, the IAT provides a useful tool for measuring dysfunctional beliefs by providing a way to directly tap the cognitive structures (i.e. associations between concepts) that are assumed to play a crucial role in eating disorders that also by its nature circumvents the problems of self-presentational strategies (Vatavian, Polivy, & Herman, 2004).

To our knowledge there is no research to date that considers implicit self-esteem in eating disorders. The main objective of this study was therefore to measure (implicit) self-esteem using the IAT and to make comparisons between an eating disordered and healthy control group. It was hypothesized that individuals with eating disorders would have a less positive implicit self-esteem bias compared to individuals without eating disorders. In other words, individuals with eating disorders would be slower to respond when the concepts of 'self' and positive words were paired together on a single response key, and faster to respond when the concepts of 'self' and negative words were paired together than healthy controls. As a result the difference between the two conditions would produce a lower implicit self-esteem score for individuals with eating disorders compared to healthy controls. In addition it was hypothesized that individuals with eating disorders would have lower levels of explicit self-esteem compared to individuals without eating disorders.

Some additional factors (depression, perfectionism and social anxiety) were measured and controlled for to ensure that they did not have an impact on the results of the IAT or explicit self-esteem measures. Depression is highly correlated with self-esteem (e.g. Haaga et al., 1991; Bernet et al., 1993), and therefore it was important to ensure that any observed results were not due to depressive symptomology. Similarly, perfectionism is theorised to play a significant role in eating disorders (see Franco-Paredes, Mancilla-Díaz, Vázquez-Arévalo, López-Águilar, & Alvarez-Rayón, 2005 for a review). Attempting to control eating habits, weight and shape, and adhering to strict rules to achieve these standards is perfectionistic in nature and therefore, perfectionism was controlled for. Preoccupation with appearance and how the self is perceived by others has also been linked to deficits in social self confidence and raised levels of social anxiety (Striegel-Moore, Silberstein, & Rodin, 1993; Grabhorn, Stenner, Kaufhold, Overbeck & Stangier 2005) and as such social anxiety was controlled for.

Finally, in order to ensure that the results from the SE-IAT were not due to idiosyncratic responding on the part of the eating disordered group, a neutral IAT (flower-insect IAT) was included to check that the eating disordered group responded normally.

Method

Approval for this study was granted by the school of psychology ethics committee (see appendix A) and COREC (see appendix B).

Participants

The participants with eating disorders (Binge Eating Disorder: BED or BN) were recruited from mental health or specialist eating disorder services. Twenty participants were self selected as they responded to either poster adverts (appendix C) or participant information sheets (appendix D). Seventeen of these participants had BN and three had BED. A matched healthy control group based on gender, age, BMI, and marital status were recruited using a university research participation scheme for which they received course credits. Of the 39 participants who responded, 31 were invited to take part in the study (based on the matching criteria). Of those invited to participate, seven were excluded as they had raised levels of eating pathology and a further four were excluded because they did not meet the criteria for the improved scoring algorithm (see IAT data reduction section below). The final sample comprised 20 eating disordered and 20 healthy control participants ($n = 40$).

The participants with eating disorders had already received a diagnosis of either BN or BED, but were screened further using the Structured Clinical Interview for DSM IV TR axis 1 Disorders (SCID-1: First, Gibbon, Spitzer, & Williams, 2001) to ensure that their symptoms were current. The SCID was also used to screen controls to ensure they did not have any eating disordered pathology. The Bulimic Inventory Test, Edinburgh (BITE: Henderson & Freeman, 1987) was used as a further screening tool. Scores of 10 or more on the symptom scale, and scores of five or more on the severity scale, indicate a raised level of eating difficulty. Therefore, any healthy control participant scoring 10 or more on the symptom scale or five or more on the severity scale was excluded.

Measures

Explicit Measures

The Bulimic Inventory Test Edinburgh (BITE; Henderson & Freeman, 1987) is a 33 item self-report measure designed to identify subjects with symptoms of bulimia nervosa or binge-eating. It consists of two scales, the symptom scale and the severity scale. Scores of 10 and above on the symptom scale and five and above on the severity scale indicate raised levels of eating pathology. Both the symptom scale and the severity scale have good inter-item reliability, $\alpha = .96$ and $\alpha = .62$ respectively, and good test-retest reliability, $r = .86$ (Henderson & Freeman, 1987).

The Beck Depression Inventory, second edition (BDI-II; Beck, Steer, & Brown, 1996) is a revised version of the original BDI (Beck et al., 1979). It is a 21-item, four choice inventory designed to assess levels of depression and has been used with a variety of clinical populations (see Beck and Steer, 1984). Scores range from 0-63. Alpha reliability coefficients of the BDI have been found to exceed .90 in a range of populations (Beck, Steer, & Garbin, 1988). BDI scores were entered as a covariate in the analyses to determine whether depression affected scores on the IAT.

The Rosenberg Self-Esteem scale (RSE; Rosenberg, 1965) is a global measure of self-esteem. It is a 10-item self-report inventory, which asks participants to respond using a four-point scale, ranging from, 1, strongly disagree, to 4, strongly agree. The RSE is reliable, valid, and commonly used in research and clinical practice (see Blascovich & Tomaka, 1991). Higher scores indicate lower levels of self-esteem. RSE scores were compared between the groups to investigate differences in explicit self-esteem.

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1997) is a 20-item, self-report measure of social anxiety. For each item respondents are asked to indicate how much each statement is characteristically true of them on a five-point Likert rating scale ranging from not at all to extremely. The scale is shown to have high internal consistency, $\alpha = .90$, and has good test-retest reliability, $r = .92$ (Mattick & Clarke, 1997). Higher scores indicate more social anxiety. SIAS scores were entered as a covariate in the analyses to determine whether social anxiety affected scores on the IAT.

The Shape And Weight Based Self-esteem inventory (SAWBS; Geller, Johnston, & Madsen, 1997) measures the contribution of shape and weight to overall self-esteem. First, participants select from a list of attributes (e.g. romantic relationships, weight and shape, competence at work) those that are important to how they have felt about themselves over the past four weeks. They then rank order the attributes in terms of how much their opinion of themselves is based on each. Then, they divide a circle into pieces, such that each piece reflects how much their self-opinion is based on each of the ranked attributes. The SAWBS score is the angle, in degrees, of the shape and weight section of the circle. The SAWBS has good validity and test-retest reliability, $r = .81$ (Geller, Johnston, Madsen, Goldher, Remick, & Birmingham, 1998). Larger angles represent larger proportions of overall self-esteem that are made up of shape and weight concerns. SAWBS scores were compared between groups to investigate differences in explicit self-esteem, related specifically to weight and shape.

The Positive And Negative Perfectionism Scale (PANPS; Terry-Short, Owens, Slade, & Dewey, 1994) is a 40-item self-report questionnaire

designed to measure perfectionism defined in terms of both positive and negative outcomes, and as such it divides into two subscales; positive perfectionism and negative perfectionism. Positive perfectionism is described as deriving from positive reinforcement and negative perfectionism is described as perfectionist behaviour that is developed through negative reinforcement. The questionnaire is available in a standardised format and has good reliability and internal validity (Terry-Short et al., 1994). Higher scores on both subscales represent higher levels of positive and negative perfectionism. PANPS scores were entered in the analyses as covariates to determine whether perfectionism affected scores on the IAT.

Implicit Measures

The original Implicit Associations Test (IAT: Greenwald et al., 1998) and the later self-esteem specific IAT (SE-IAT: Greenwald, & Farnham, 2000) are computer based reaction time measures that assess the relative strength of association between two concept categories. The IAT is found to possess reasonable test-retest reliability ($r = .60$) and good internal consistency values ($\alpha = .80$; Bosson et al., 2000). The IATs used were replications of the original (Greenwald et al. 1998). The programme took the form of a windows compatible executive file, which was created using Authorware 7.0 (Macromedia, 2006). Both IATs were administered on an Ergo, Preceptor 601 laptop computer using a black background screen. The IAT programmes appeared in the middle of the screen in a 15 by 12cm information box. General instructions appeared in this box and participants could move forward and backward through them as required. Each block appeared on a green background within this box, with the category words

positioned in the left and right hand top corners of the box in capital letters.

The words to be categorised appeared in the middle of the box in lower case.

Participants pressed P on the keyboard for words associated with the right hand category and Q for words associated with the left hand category.

Self-esteem IAT paradigm (SE-IAT)

The SE-IAT involved pairing positive (valuable, worthy, acceptable, competent, reliable, and confident) and negative (defective, inadequate, inferior, weak, worthless, and critical) attribute concept words with target concepts of 'self' (me, I, myself, my, mine, and own) and 'other' (they, them, themselves, their, theirs, and others). The same words were used for all participants, and were presented randomly within each trial.

The SE-IAT assessed the strength of association between attribute and target concepts by representing categories of stimuli on a pair of computer response keys (Q and P) in a series of five discrimination tasks. The first two blocks involved simple discrimination tasks in which participants were asked to categorize sets of stimuli (negative words vs. positive words, followed by other vs. self words) into their appropriate categories by pressing one of two response keys (pressing the Q key for negative and the P key for positive words, followed by the Q key for other words and the P key for self words). Twenty-four response trials were used in the first two blocks. In the third block, the first two discrimination tasks were combined so that participants responded to negative or other words (and positive or self words) with the same response keys (Q key for negative or other, and P key for positive or self). This is known as the 'congruent block', in that it should be easier to respond when the concepts are cognitively related, thereby

producing faster response times. Forty-nine response trials were used in the third block. The fourth block involved a reversal in the response requirements for other and self words (Q key for self words, and P key for other words). Twenty-four response trials were used in the fourth block. Finally, the fifth block of the procedure incorporated the response category reversal from the fourth block so that participants responded to negative or self words (and positive or other words) with the same response keys (pressing the Q key for negative or self words, and the P key for positive or other words). This is known as the 'incongruent block', in that it should be harder to respond when the concepts conflict cognitively, thereby producing slower response times. Forty-nine response trials were used in the fifth block. IAT block presentation details and examples are shown in appendices H and I. Errors were made apparent to participants by a red cross that appeared in the middle of the box. Unlike the original paradigm, in this programme participants did not need to press the correct response key in order for the next word to appear.

The order in which the congruent and incongruent blocks are presented can influence the magnitude of the IAT effect (Farnham, Greenwald & Banaji, 1999), where it is believed that a larger score will be obtained when the congruent block is presented before the incongruent block, and diminished when the incongruent block is presented before the congruent block. Blocks were therefore counterbalanced to reduce possible task order effects. This meant that when reversed, block one remained the same (Q key for negative and P key for positive words). Block two changed so that the Q key represented self words and the P key represented other words). Block three became the incongruent block (Q key for negative or self

words, and P key for positive and other words). Block four switched so that the Q key represented self words and the P key represented other words. Finally, block five therefore became the congruent block (Q key for negative or other words and P key for positive or self words).

Flower-insect IAT paradigm

The flower-insect IAT involved pairing positive (valuable, worthy, acceptable, competent, reliable, and confident) and negative (defective, inadequate, inferior, weak, worthless, and critical) attribute concept words with target concepts of 'flowers' (rose, daffodil, tulip, daisy, poppy, and lily) and 'insects' (cockroach, centipede, mosquito, wasp, flea, and grasshopper). The same words were used for all participants, and were presented randomly within each block. The same procedure was followed as in the SE-IAT (except flower and insect target words were used instead of self and other target words). Once again blocks were counterbalanced (again following the above outlined SE-IAT procedure). The flower-insect IAT always followed the SE-IAT and followed the same counterbalanced procedure as the SE-IAT. Therefore, if the congruent block was presented first, followed by the incongruent block in the SE-IAT, blocks were also presented in this order for the flower-insect IAT.

The flower-insect IAT generally reveals more positive associations with flowers than with insects (Greenwald et al., 1998). Thus congruent blocks are where flowers and positive words (and insects and negative words) are combined, and incongruent blocks combine positive and insect words (and negative and flower words).

The flower-insect IAT was included in the study as a covariate, in order to determine whether any observed group difference could be accounted for by differences in implicit self-esteem rather than by general IAT performance or response speed differences.

Attribute Word Selection

An initial list comprised of 56 words (28 considered to be positive and 28 considered to be negative) was created. All words were attributes and thought to be representative of global self-esteem (e.g. worthless) and not related specifically to weight or shape (e.g. attractive). Lists were distributed to 20 clinical and trainee clinical psychologists who were asked to rate how positive or negative the word was on a scale of -3 to +3 (where -3 is extremely negative, 0 is neutral, and +3 is extremely positive), and then asked to rate the emotionality of the word on a scale of 0-10 (0 representing not at all emotional and 10 representing extremely emotional). Any words rated as neutral on the scale of how negative or positive the word was were excluded, as it is important for words in the IAT to be clearly representative of one pole of a given attribute (see De Houwer, 2002). The six positive and six negative words rated as the most emotional were compared using t-tests. They did not differ significantly in number of letters, $t(10) = -.326, p = .75$, number of syllables, $t(10) = -.958, p = .36$, or in word frequency, $t(10) = -.346, p = .74$.

Target Word Selection

The target concept words used in both IATs were selected using words from previous studies.

Category Labels

The attribute word labels used for both IATs were positive and negative. The target word labels for the flower-insect IAT were flowers and insects, however, the target word labels of 'me' and 'not me' were assigned instead of self and other on the SE-IAT. This was because the label of other is thought to be confusing in that it may have different meanings for different individuals (Karpinski, 2005).

IAT data reduction

Only the data from blocks 3 and 5 in the IAT was used and these data were transformed following the improved scoring algorithm (see Greenwald, Nosek, & Banaji, 2003 for a full description). In summary, 48 response trials from test blocks 3 and 5 were used. The first trials from each of these blocks were not included in the analysis. Error trials were replaced with the block mean and an automatic penalty applied. Blocks with trials exceeding 10,000ms and with more than 10 percent of trials less than 300ms were excluded. A difference score was calculated between the mean scores on the two critical blocks. This was then divided by the standard deviation of the trials across both blocks (incongruent block – congruent block divided by the pooled standard deviation for the two blocks). The score obtained is the IAT-D effect.

The standard interpretation of the self-esteem IAT is that it measures the associations one has with the self. If a person has positive associations with the self, then the self and positive (and the other and negative) block should be easy and response times ought to be fast. Likewise, the self and negative (and the other and positive) block should be more difficult and

response times ought to be slow. As a result, participants with predominantly positive self-associations are faster to respond on the self and positive (and other and negative) block than the self and negative (and other and positive) block. Similarly, a positive (IAT-D effect) score will be obtained if participants have positive implicit associations with the self. Scores of zero indicate no difference in the strength of association between the two blocks (congruent and incongruent).

Procedure

Participants were tested individually. Each participant was seated in a small room at a desk, with a laptop computer. The researcher remained in the room with each participant to give instructions, but sat in the corner of the room positioned behind the participant, out of sight. After signing a consent form (see appendix E), participants were asked to complete two IAT paradigms (the SE-IAT was completed first, followed by the flower-insect IAT). The SCID then followed and finally participants were asked to complete the six self-report measures. The IAT was completed prior to the screening interview and completion of the questionnaires, in order to avoid provoking negative affect, which might influence performance on the IAT. All participants were debriefed (see appendix F) and received debriefing information (see appendix H) after completing all the measures.

Results

Statistical analysis was conducted using SPSS, version 12.01 (SPSS, 2003). Data met the assumptions required to perform parametric analysis. Significance levels were set at an alpha value of 0.05 and all tests were two-tailed.

The groups were matched on a number of criteria. All participants were female and the groups did not differ significantly in age, $t(38) = 1.67, p = .104$, BMI, $t(38) = .89, p = .381$, or by marital status, $\chi^2(2, N = 40) = .47, p = .79$. The mean age of the eating disordered group was 23.05 years ($SD = 5.23$) and 20.55 ($SD = 4.21$) for the healthy control group. The mean BMI for the eating disordered group was 22.98 ($SD = 5.35$) and 21.75 ($SD = 3.15$) for the healthy control group.

There were differences between the groups on the measure of eating pathology. The eating disordered group had higher symptom scores ($M = 22, SD = 5.68$) than the healthy control group ($M = 3.05, SD = 2.33$), $t(38) = 13.8, p < .001$. Similarly, the eating disordered group had higher severity scores ($M = 9.1, SD = 4.33$) than the healthy control group ($M = 1.2, SD = 1.96$), $t(38) = 7.44, p < .001$.

Flower-Insect Implicit Association Test

Table 1 shows the means, standard deviations and ranges for the IAT-D effect and for the congruent and incongruent blocks on the flower-insect IAT. This IAT was included in order to check whether there were any differences between the groups in their response on a neutral IAT. There was no difference between the groups on the IAT-D effect, $t(38) = .057, p = .96$. However, the eating disordered group was significantly slower on both the incongruent block, $t(38) = 3.20, p = .004$, and on the congruent block of the flower-insect IAT, $t(38) = 2.81, p = .01$. This indicates that while the eating disordered group showed the same overall IAT effect, namely a bias towards associating flowers and positive, and insect and negative words, participants

in this group were generally slower to respond to both sets of pairings. These slower response times will be taken account of in the analysis of the SE-IAT.

Table 1: Means, standard deviations and range of scores for both IATs for both the eating disordered ($n = 20$) and healthy control ($n = 20$) groups.

IAT measurement	Group	Mean (<i>SD</i>)	Minimum	Maximum	Range
Self-Esteem IAT					
Test block	ED	718.64 (274.31)	412.67	1452.50	1039.83
	HC	605.86 (144.53)	448.48	985.00	536.42
Congruent block	ED	803.58 (283.67)	459.58	1464.98	1005.40
	HC	666.79 (87.74)	547.63	877.52	329.90
Incongruent block	ED	1310.24 (552.20)	475.85	2734.40	2258.55
	HC	800.56 (101.37)	651.69	1018.44	366.75
IAT-D effect	ED	0.87 (0.50)	-0.56	1.61	2.17
	HC	0.59 (0.35)	-0.21	1.18	1.21
Flower-Insect IAT					
Congruent block	ED	836.15 (266.32)	512.71	1476.04	963.33
	HC	660.29 (87.37)	504.52	859.38	354.86
Incongruent block	ED	1010.23 (328.54)	441.69	1709.65	1267.96
	HC	763.69 (104.03)	606.98	1055.19	448.21
IAT-D effect	ED	0.47 (0.55)	-0.47	1.39	1.86
	HC	0.48 (0.37)	-0.001	1.16	1.16

Note: *SD* = standard deviation, ED = eating disordered group, HC = healthy control group.

Self-Esteem Implicit Associations Test – (SE-IAT)

In order to investigate whether individuals with eating disorders had a less positive implicit self-esteem bias, the difference between the groups on the IAT-D effect was analysed using an independent t-test. There was a

significant difference between the groups on the IAT-D effect, $t(38) = 2.06$, $p = .046$. However, contrary to the hypothesis, the eating disordered group had a higher IAT-D effect score than the healthy control group, indicating that the eating disordered group had a higher positive implicit self-esteem bias than the healthy controls. Table 1 shows the means, standard deviations and range of scores for the test block, congruent block, incongruent block and the IAT-D effect for the SE-IAT.

In order to explore this surprising result further, a 2 (block: congruent versus incongruent) X 2 (group: eating disordered versus healthy controls) mixed ANOVA was carried out using the reaction times from the congruent and incongruent blocks as dependent variables. There was a significant main effect of block, $F(1,38) = 42.61$, $p < .001$, a significant main effect of group, $F(1,38) = 13.61$, $p = .001$, and a significant interaction, $F(1,38) = 14.45$, $p = .001$. This interaction is demonstrated in Figure 1.

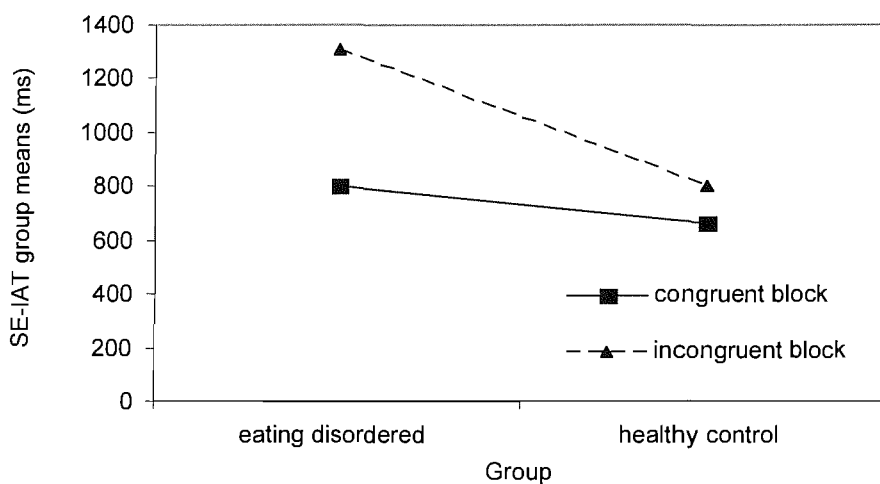


Figure 1: Interaction between the groups on the congruent and incongruent blocks of the SE-IAT.

This interaction was explored using post-hoc independent t-tests. The eating disordered group were slower at responding on the congruent block ($M = 803.58$, $SD = 283.67$) than the healthy control group ($M = 666.79$, $SD = 87.74$), $t(38) = 2.06$, $p = .05$, and were also slower at responding on the incongruent block ($M = 1310.34$, $SD = 552.20$) than the healthy control group ($M = 800.56$, $SD = 101.37$), $t(38) = 4.06$, $p = .001$. Related t-tests were used to look at the differences between the congruent and incongruent blocks for each group. Both groups demonstrated a bias towards faster responding on the congruent block, but this difference was larger for the eating disordered group than in the healthy control group. There was a significant difference between the congruent and incongruent block for the eating disordered group, $t(19) = 5.29$, $p < .001$, and for the healthy control group, $t(19) = 6.30$, $p < .001$.

The differences between the groups for the incongruent and congruent blocks are interesting, but could be the result of an overall difference in reaction times between the two groups, as evidenced in the flower-insect IAT. In order to test for this possibility separate univariate ANCOVAs were performed using the response times from the congruent and incongruent blocks as the dependent variables and controlling for speed by using the flower-insect block means as covariates. When this was done the difference between the groups on the congruent block was no longer significant after controlling for the effect of speed using the congruent block of the flower-insect IAT as a covariate. However, the difference between the groups on the incongruent block did remain significant after controlling for the effect of speed, using the incongruent block of the flower-insect IAT as a covariate, F

(2, 37) = 4.89, $p = .033$. This suggests that the difference between the groups observed on the IAT-D effect is largely carried by differences between the groups on the incongruent block. An additional check for an overall effect of response speed differences involved the examination of group differences on the first test block of the SE-IAT, which used positive and negative words. There was no difference between the groups on this block, $t(38) = 1.63$, $p = .112$. These checks indicate that the observed difference on the SE-IAT were not simply a by-product of overall reaction time differences between the two groups or the result of idiosyncratic responding on the part of the eating disordered group.

Eating disordered patients are likely to have high levels of other types of pathology, for example, depression, social anxiety and perfectionism and these might have influenced the results. The eating disordered group had higher levels of depression, $t(38) = 3.069$, $p = .005$, and higher social anxiety, $t(38) = 4.66$, $p = <.001$ than the healthy controls. The healthy controls had higher levels of positive perfectionism than the eating disordered group, $t(38) = -3.18$, $p = .004$. There was no significant difference between the groups on the scale of negative perfectionism ($t(38) = 1.93$, $p = .062$). Table 2 shows means, standard deviations and range of scores for both groups on all the explicit measures used. Despite the group differences in scores, after controlling for the effects of depression, social anxiety and perfectionism, using separate univariate ANCOVAs with BDI, SIAS, and PANPS scores as covariates and IAT scores as dependent variables, the group differences on the SE-IAT incongruent block and SE-IAT-D effect remained significant ($p = .001$ to $.009$).

Table 2: Means, standard deviations and range of scores for both the eating disordered ($n = 20$) and healthy control ($n = 20$) groups on the explicit measures.

Measure	Mean (SD)		Minimum		Maximum		Range	
	ED	HC	ED	HC	ED	HC	ED	HC
BITE (Sym)	22.00 (5.69)	3.05 (2.33)	12	0	28	8	16	8
BITE (Sev)	9.10 (4.33)	1.20 (1.97)	2	0	17	7	15	7
BDI-II	17.10 (14.88)	6.35 (4.93)	0	0	51	20	51	20
SIAS	35.25 (17.19)	15.75 (7.48)	10	4	67	34	57	30
PANPS (pp)	63.55 (15.19)	75.50 (7.17)	32	63	86	94	54	31
PANPS (np)	65.40 (17.63)	55.55 (14.60)	24	27	96	82	72	55
RSE	27.05 (6.40)	17.65 (4.64)	13	10	40	29	27	19
SAWBS	122.75 (63.26)	43.75 (43.40)	45	0	250	125	205	125

Note: *SD* = standard deviation, ED = eating disordered group, HC = healthy control group. BITE (Sym) = symptom scale of Bulimic Inventory Test, Edinburgh, BITE (Sev) = severity scale of Bulimic Inventory Test, Edinburgh, BDI-II = Beck Depression Inventory, second edition, SIAS = Social Interaction Anxiety Scale, PANPS (pp) = positive perfectionism scale of the Positive and Negative Perfectionism Scale, PANPS (np) = negative perfectionism scale of the Positive and Negative Perfectionism Scale, RSE = Rosenberg Self-Esteem inventory, SAWBS = Shape and Weight Based Self-esteem inventory.

Explicit Self-esteem

In order to investigate whether individuals with eating disorders had lower levels of explicit self-esteem compared to individuals without eating disorders independent t-tests were used to compare scores on the two explicit self-esteem measures. The eating disordered group reported lower levels of self-esteem on the RSE (global self-esteem measure) ($M = 27.05$, $SD = 6.40$) than the healthy control group ($M = 17.65$, $SD = 4.64$), $t(38) =$

5.32, $p = >.001$. The eating disordered group also reported lower levels of self-esteem on the SAWBS (shape and weight specific self-esteem measure) ($M = 122.75$, $SD = 63.26$) than the healthy control group ($M = 43.75$, $SD = 43.40$), $t(38) = 4.61$, $p = >.001$. A univariate ANCOVA was carried out using the scores from the explicit self-esteem measures as dependent variables and scores from the BDI, PANPS, and SIAS as covariates in the analysis. The differences between the groups remained significant after controlling for depression, perfectionism and social anxiety, ($p = <.001$ to $.002$).

In order to see if there was an association between the explicit and implicit measures data were analysed using Pearson's r correlations. There were no significant correlations between the RSE and SE-IAT-D effect, $r = -.388$, $n = 20$, $p = .09$, for the eating disordered group or the healthy control group, $r = -.266$, $n = 20$, $p = .26$, or between the SAWBS and SE-IAT-D effect, $r = .181$, $n = 20$, $p = .44$ for the eating disordered group, or the healthy control group, $r = .029$, $n = 20$, $p = .904$.

Discussion

The main aim of this study was to compare implicit self-esteem in patients with eating disorders (BN or BED) to healthy controls using the SE-IAT. Following recent cognitive models (e.g. Fairburn et al., 2003) it was predicted that the eating disordered group would have a less positive implicit self-esteem bias than the healthy control group. There was a significant difference between the groups on the IAT-D effect but not in the expected direction. Instead of finding that the eating disordered group had less positive implicit self-esteem than the healthy controls, the results of this study showed

that the eating disordered group had more positive implicit self-esteem. This surprising result will be discussed in more detail below.

The second aim of this study was to compare individuals with eating disorders (BN or BED) and healthy controls on the RSE and SAWBS to investigate whether individuals with eating disorders had lower levels of explicit self-esteem (as measured by mean group scores on the two explicit self-report measures). There was a significant difference between the groups on both the RSE (global explicit self-esteem measure) and the SAWBS (shape and weight specific explicit self-esteem measure).

The differences observed between the groups on the explicit self-esteem measures are typical of previous research findings and are consistent with clinical experience. The finding that individuals with eating disorders have higher implicit self-esteem than healthy controls is, however, surprising and is not consistent with recent developments of cognitive theory in eating disorders. This finding is also particularly puzzling given the scores reported on the explicit self-esteem measures. As the IAT is a new measure, one possibility is that the current findings are a methodological artefact rather than an interesting discovery.

In this study it has been assumed that the IAT provides a measure of implicit self-esteem, yet the debate about what the IAT actually measures continues (see De Houwer, 2002 for a review; Karpinski, 2005). The absence of a correlation between explicit and implicit self-esteem measures has led to the development of theories that posit two distinct, albeit interacting self-esteem systems (e.g. Devine, 1989; Greenwald & Banaji, 1995; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Wilson, Linsey, & Schooler,

2000). However, Fazio and Olsen (2003) argue that this idea is inferred rather than demonstrated as there is a lack of direct evidence testing the proposition. They argue that the typically low correlation between explicit and implicit measures may be attributed to the discriminant validity between the different types of measures, where one relies on self-report (explicit) and the other relies on reaction times (implicit). If this is the case, then perhaps the IAT is a measure that works implicitly, rather than being a genuine measure of implicit self-esteem.

A second methodological artefact may concern word choice because the words used in the IAT can influence the results (see De Houwer, 2001; 2002). The choice of words used in the IAT can have an effect on outcome, for example, females were faster to respond to female names than male names when paired with positive words related to women (e.g. intuitive). By comparison, males were faster to respond when male names, rather than female names, were paired with positive words typically related to men (Steffens & Plewe, 2001). IAT effects may therefore depend on the stimulus provided (De Houwer, 2002). The words selected in this study were chosen to represent global negative self-evaluations. However, the nature of self-esteem is highly complex. It is possible that the six attribute words selected to represent global self-evaluations had different meanings for the eating disordered group compared to the healthy controls. Although words associated with weight and shape were purposefully avoided in this study, using such words may have produced different results on the SE-IAT. Indeed, obese individuals and restrained eaters responded similarly when high fat food and negative words (or low fat food and positive words) and

when high fat food and positive words (or low fat foods or negative words) were paired together (Roefs & Jansen, 2002). It would be interesting to use the IAT with words related to weight and shape to see whether they produce a different outcome to the present results.

Whilst acknowledging that the IAT is a relatively new measure, and that how it works, what it actually measures and the potential effect of different stimulus words is still under debate (De Houwer 2001; 2002), one strength of this study is that it included a check (the flower-insect IAT) as a validation of the SE-IAT used with this population. The scores of the groups on the flower-insect IAT-D effect did not differ, which suggests that the observed differences on the SE-IAT-D effect were not due to idiosyncratic IAT performance differences on the part of the eating disordered participants. Further checks were performed to ensure that the observed differences between the groups on the SE-IAT-D effect and incongruent block were not due to differences in speed of response. After performing these checks the results remained significant, which suggest that the observed differences reflect interesting and genuine differences between the groups on the SE-IAT. If methodological problems are not responsible for the results of the SE-IAT, then other explanations must be considered.

Perhaps the discovery that the eating disordered group had a positive implicit self-esteem bias is not surprising given that a small body of evidence demonstrates that positive implicit self-esteem is retained in some clinical groups. Currently depressed individuals showed evidence of positive implicit self-esteem on three different self-esteem measures compared to non depressed individuals (Raedt, Schacht, Franck, & De Houwer, in press). In a

group of formerly depressed patients although self-esteem dropped following a mood induction task implicit self-esteem still remained positive (Gemar et al., 2001).

One possible explanation for the maintenance of self-esteem even in the presence of an eating disorder is that the implicit self-esteem system (assuming explicit and implicit self-esteem systems are distinct) develops early in childhood and involves unconscious automatic self-evaluations (Koole, Dijksterhuis & van Knippenberg, 2001). There is evidence in support of this proposal, for example, young children develop preferences for positive feedback (Swann & Schroeder, 1995) in their preference for voices that sound accepting (Fernald, 1993). This initial tendency towards positivity may reflect the young person's primary concern with establishing a secure positive implicit self. Self-enhancement may then develop by incorporating positive information and rejecting negative information (Solomon, Greenberg, & Pyszcznski, 1991). From this viewpoint, it is not surprising that a positive self-esteem bias is maintained even in clinical populations, provided a positive implicit self was established in early childhood. However, there may be individuals where a positive implicit self is not established in early childhood, for example, individuals with personality disorders who have extremely disruptive or abusive early developmental histories. This possibility could be investigated by testing individuals with borderline personality disorder on the IAT, who are more likely to have been exposed to invalidating or traumatic environments in early childhood (Young, 1994) and thus may not have established positive implicit self-esteem, to see whether a less positive or indeed if a negative implicit self-esteem bias exists.

Whilst the results of this study, which find a positive implicit self-esteem bias for the eating disordered group, might be consistent with the development of early positive implicit self, what remains puzzling is that implicit self-esteem in this study was not just positive but was higher for individuals with eating disorders compared to healthy controls. Two possible explanations for this puzzling finding are considered below.

One explanation is that although high self-esteem is generally considered necessary for psychological wellbeing (e.g. Diener, 1984; Tennen & Affleck, 1993), in some cases high self-esteem can be associated with negative consequences for the self (Jordan et al., 2003). High self-esteem, in some cases, has been linked to maladjustment (Colvin, Block, & Funder, 1995), delusions and paranoia (Bentall, Kinderman, & Kaney, 1994), aggression (Baumeister, Smart, & Boden, 1996), and prejudice (Crocker, Thorripson, McGraw, & Ingerman, 1987). Contemporary theorists have attempted to explain these apparently contradictory findings by proposing that there are actually two forms of high self-esteem: secure and fragile (e.g. Deci & Ryan, 1995; Kernis, 2003). Secure high self-esteem reflects positive attitudes towards the self that are realistic, and resistant to threat. By comparison, fragile high self-esteem involves feelings of self-worth that are vulnerable to challenge and need constant validation. One way to distinguish between fragile and secure high self-esteem is to examine the discrepancy between implicit and explicit self-esteem (Brown & Bosson, 2001; Bosson, Brown, Zeigler-Hill, & Swann, 2003; Jordan et al., 2003; Kernis et al., 2005; Zeigler-Hill, 2006). Discrepancies between explicit and implicit self-esteem (and thus fragile high self-esteem) may take the form of high explicit self-

esteem and low implicit self-esteem (termed discrepant high self-esteem), or low explicit self-esteem and high implicit self-esteem (termed discrepant low self-esteem; Zeigler-Hill, 2006).

The idea of fragile self-esteem is supported by studies that have shown that large discrepancies between explicit and implicit self-esteem (discrepant high self-esteem, i.e. in the direction of high explicit and low implicit) are associated with higher levels of defensiveness (Jordan et al., 2003), and narcissism (Zeigler-Hill, 2006). People who show large discrepancies between explicit and implicit self-esteem have also been found to be more self-promoting and more negative in their ratings of an out-group member (Kernis et al., 2005). Discrepant low self-esteem, which involves high implicit but low explicit self-esteem (as found in this study), although thought to be less common than discrepant high self-esteem may similarly be indicative of current psychological distress (Epstein, 1983). Therefore, the apparent presence of discrepant self-esteem may distinguish individuals with eating disorders from those without and may also distinguish those likely to develop eating disorders or most likely to relapse. However, given the lack of evidence to support the theory of discrepant *low* self-esteem further research is required before conclusions can be drawn.

The second possible explanation is that the incongruent block was somehow threatening. The incongruent block paired negative words with the self. Individuals with BN are actively engaged in attempting to enhance positive self-esteem by adhering to strict rules such as controlling weight and eating. Therefore a task of pairing self and negative words may have seemed threatening to their ideal sense of self. Indeed, the results of the SE-IAT

indicate a cognitive bias towards the self. When trying to determine where the positive implicit bias resulted, it seems that the result from the incongruent block of the IAT may have been responsible. There was no significant difference between the groups on the congruent block after controlling for speed. Therefore, it appears that individuals with eating disorders found the task of responding to positive and self (or negative and other words) equally easy or difficult compared to healthy controls. In contrast, the significant difference between the groups on the incongruent block appears to show that the eating disordered group found the task of responding to negative and self (or positive and other words) particularly difficult as they were slower than the healthy control group. Individuals with eating disorders do show pronounced negative cognitive processing biases (Fairburn et al., 2003) and there is some evidence to show that individuals with BN have cognitive biases towards threatening words (McManus, Waller, & Chadwick, 1996). For example, individuals with BN were slower to colour name threatening information on a stroop task (McManus et al., 1996). The incongruent block of the SE-IAT may therefore represent a cognitive bias, where individuals with eating disorders are slower to respond when negative and self words are paired on the same response key, because they find this pairing more threatening than the healthy control participants. It would be interesting to repeat the study comparing a group of individuals with BN with other psychiatric populations, where cognitive biases toward threatening information to self is not apparent.

To conclude, the results of this study are somewhat puzzling. While the results might be due to a methodological artefact, the study was designed

in order to substantially rule out this possibility. If the results are not the result of a methodological artefact, then the finding that implicit self-esteem in BN and BED is higher than in a healthy control group is important. Although of course the study requires replication, one clinical implication of this finding involves the treatment of implicit self-esteem. Although cognitive restructuring processes are typically used in clinical practice to change cognitive biases, implicit associations are thought to be the result of learnt associations in memory. Therefore, it holds that these associations could be unlearned by repeating pairings that are contrary to the associations that currently exist, thus enhancing implicit self-esteem. Indeed, studies have found that the use of classical conditioning improves implicit self-esteem scores. When smiling faces were paired with self-relevant information (Baccus, Baldwin, & Packer, 2004), and when the word 'I' was paired with positive trait words (Dijksterhuis, 2004) implicit-self-esteem improved. However, the results of the current study, found that individuals with eating disorders have higher implicit self-esteem. Therefore, the notion of reducing implicit self-esteem through similar conditioning processes raises an ethical dilemma. A first step, that is not ethically problematic, would be to see whether implicit self-esteem changes over the course of therapy using the standard cognitive restructuring processes that are used in cognitive therapy. Longer term effects and relapse rates could then be investigated.

While the findings of this study are intriguing, and of course require replication, several explanations have been proposed to account for them. Further investigation is required and may add to the existing knowledge

about implicit cognitive processes involved in the cause and maintenance of eating disorders.

References

- Aidman, E. V. (1999). Measuring individual differences in implicit self-concept: initial validation of the self-apperception test. *Personality and Individual Differences, 27*, 211-228.
- Baccus, J. R., Baldwin, M. W., & Packer, D. (2004). Increasing implicit self-esteem through classical conditioning. *Psychological Science, 15*(7), 498-502.
- Baell, W. K., & Wertheim, E. H. (1992). Predictors of outcome in the treatment of bulimia nervosa. *British Journal of Clinical Psychology, 31*, 330-332.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). The relation of threatened egotism to violence and aggression: the dark side of high self-esteem. *Psychological Review, 103*, 5-33.
- Beck, A. T. (1976). *Cognitive Therapy and the emotional disorders*. New York: Meridian.
- Beck, A. T., Rush, A., Shaw, B., & Emery, G. (1979). *Cognitive Therapy of Depression*. New York: Guilford Press.
- Beck, A. T., & Steer, R. A. (1984). Internal consistencies of the original and revised Beck Depression Inventory. *Journal of Clinical Psychology, 40*(6), 1365-1367.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory – Second Edition*. Psychological Corporation; San Antonio, TX.
- Beck, A. T., Steer, R. A., & Garbin, M. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77-100.

- Bell, L. (2002). Does concurrent psychopathology at presentation influence response to treatment for bulimia nervosa? *Journal of Eating and Weight Disorders*, 7(3), 168-181.
- Bentall, R. P., Kinderman, P., & Kaney, S. (1994). The self, attributional processes and abnormal beliefs: Towards a model of persecutory delusions. *Behaviour Research and Therapy*, 32(3), 331-341.
- Beresin, E. V., Gordon, C., & Herzog, D. B. (1989). The process of recovering from anorexia nervosa. *Journal of the American Academy of Psychoanalysis*, 17, 103-130.
- Bernet, C. Z., Ingham, R. E., & Johnson, B. R. (1993). Self-esteem. In C. G. Costello (Ed.), *Symptoms of Depression* (pp. 141-159). New York: Wiley.
- Blascovich, J., & Tomaka, J. (1991). Measures of self-esteem. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman, (Eds.), *Measures of Personality and Social Psychological Attitudes* (Vol. 1, pp. 115-160). San Diego, CA: Academic Press.
- Bosson, J. K. (2003). Discrepant explicit and implicit self-esteem: relations to self and friend ratings of personality and physical health. Unpublished manuscript. University of Texas, Austin.
- Bosson, J. K., Brown, R. P., Zeigler-Hill, V., & Swann, W. B. (2003). Self-enhancement tendencies among people with high explicit self-esteem: the moderating role of implicit self-esteem. *Self and Identity*, 2(3), 169-187.
- Bosson, J. K., Swann, W. B., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: the blind men and the

- elephant revisited? *Journal of Personality and Social Psychology*, *79*, 631-643.
- Brown, R. P., & Bosson, J. K. (2001). Narcissus meets Sisyphus: self-love, self-loathing, and the never-ending pursuit of self-worth. *Psychological Inquiry*, *12*, 210-213.
- Colvin, C. R., Block, J., & Funder, D. C. (1995). Overly positive self-evaluations and personality: negative implications for mental health. *Journal of Personality and Social Psychology*, *68*, 1152-1162.
- Cooper, M. J., & Fairburn, C. G. (1993). Confusion over the core psychopathology of bulimia nervosa. *International Journal of Eating Disorders*, *13*, 385-389.
- Cooper, M. J., & Todd, G. (1997). Selective processing of three types of stimuli in eating disorders. *British Journal of Clinical Psychology*, *36*, 895-898.
- Cooper, M. J., Todd, G., & Cohen-Tovee, E. (1996). Core beliefs in eating disorders. *International Cognitive Therapy Newsletter*, *10*(2), 2-3.
- Cooper, M. J., Todd, G., & Wells, A. (1998). Content, origins, and consequences of dysfunctional beliefs in anorexia nervosa and bulimia nervosa. *Journal of Cognitive Psychotherapy*, *12*, 213-230.
- Cooper, M. J., Wells, A., & Todd, G. (2004). A cognitive theory of bulimia nervosa. *British Journal of Clinical Psychology*, *43*, 1-16.
- Crocker, J., Thompson, L., McGraw, K., & Ingerman, C. (1987). Downward comparison, prejudice and evaluations of others: effects of self-esteem and threat. *Journal of Personality and Social Psychology*, *52*, 907-916.

- Davis, R., Olmstead, M. P., & Rockert, W. (1992). Brief group psycho-education for bulimia nervosa II: prediction of clinical outcome. *International Journal of Eating Disorders, 11*, 205-211.
- Davis, R., McVey, G., Heinman, M., Rockert, W., & Kennedy, S. (1999). Sequencing of cognitive behavioural treatments of bulimia nervosa. *International Journal of Eating Disorders, 25*, 361-374.
- Deci, E. L., & Ryan, R. M. (1995). Human agency: the basis for true self-esteem. In M. H. Kernis (Ed.), *Efficacy, Agency, and Self-esteem* (pp. 31-50). New York: Plenum Press.
- De Houwer, J. (2001). A structural and process analysis of the implicit associations test. *Journal of Experimental and Social Psychology, 37*, 443-451.
- De Houwer, J. (2002). The implicit associations test as a tool for studying dysfunctional associations in psychopathology: strengths and limitations. *Journal of Behavior Therapy and Experimental Psychiatry, 33*, 115-133.
- de Jong, P. J. (2002). Implicit self-esteem and social anxiety: Differential self favouring effects in high and low anxious individuals. *Behaviour research and Therapy, 40*, 501-508.
- Devine, P. G. (1989). Stereotypes and prejudice: their automatic and controlled components. *Journal of Personality and Social Psychology, 56*(1), 5-18.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542-575.

- Dijksterhuis, A. (2004). I like myself, but I don't know why: enhancing implicit self-esteem by subliminal evaluative conditioning. *Journal of Personality and Social Psychology, 86*(2), 345-355.
- Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the nature of prejudice: automatic and controlled processes. *Journal of Experimental Social Psychology, 33*, 510-540.
- Epstein, S. (1983). The unconscious, the pre-unconscious, and the self-concept. In J. Suls & A. Greenwald (Eds.), *Psychological Perspectives on the Self* (Vol. 2, pp. 220-247). Hillsdale, NJ: Erlbaum.
- Fairburn, C. G., & Cooper, P. J. (1997). Eating disorders. In K. Hawton, P. M. Salkovskis, J. Kirk, & D. M. Clark (Eds.), *Cognitive Behaviour Therapy for Psychiatric Problems* (pp. 277-314). Oxford: Oxford University Press.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A transdiagnostic theory and treatment. *Behaviour Research and Therapy, 41*, 509-528.
- Fairburn, C. G., Kirk, J., O'Connor, M., & Anastasiades, P. (1987). Prognostic factors in bulimia nervosa. *British Journal of Clinical Psychology, 26*, 223-224.
- Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993a). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology, 61*, 696-698.

- Fairburn, C. G., Welch, S. L., Doll, H. A., Davies, B. A., & O'Connor, M. F. (1997). Risk factors for bulimia nervosa: a community based case-control study. *Archives of General Psychiatry*, *54*, 509-517.
- Farnham, S. D., Greenwald, A. G., & Banaji, M. R. (1999). Implicit self-esteem. In D. Abrams & M. A. Hogg (Eds.), *Social Identity and Social Cognition* (pp. 230-248). Oxford, England: Blackwell Publishers.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: their meaning and uses. *Annual Review of Psychology*, *54*, 297-327.
- Fernald, A. (1993). Approval and disapproval: infant responsiveness to vocal affect in familiar and unfamiliar languages. *Child Development*, *64*, 657-674.
- First, M. B., Gibbon, M., Spitzer, R. L., & Williams, J. B. W. (2001). *Structured Clinical Interview for DSM-IV-TR Axis 1 Disorders*. Biometrics Research Department, New York State Psychiatric Institute: NY.
- Franco-Parades, K., Mancilla-Díaz, J. M., Vázquez-Arévalo, R., López-Aguilar, X., & Álvarez-Rayón, G. (2005). Perfectionism and eating disorders: a review of the literature. *European Eating Disorders Review*, *13*, 61-70.
- Freeman, C. P., Sinclair, E., Turnbull, J., Annandale, A. (1985). Psychotherapy for bulimia: a controlled study. *Journal of Psychiatric Research*, *19*, 473-478.
- Garner, D. M., Olmsted, M. P., Davis, R., Rockert, W., Goldbloom, D. & Eagle, M. (1990). The association between bulimic symptoms and

reported psychopathology. *International Journal of Eating Disorders*, 9, 1-15.

Garner, D. M., Rockert, W., Davis, R., Garner, M. V., Olmstead, M. P., & Eagle, M. (1993). Comparison of cognitive-behavioral and supportive-expressive therapy for bulimia nervosa. *American Journal of Psychiatry*, 150, 37-46.

Geller, J., Johnston, C., & Madsen, K. (1997). The role of shape and weight in self-concept: the shape and weight based self-esteem inventory. *Cognitive Therapy and Research*, 21, 5-24.

Geller, J., Johnston, C., Madsen, K., Goldner, E. M., Remick, R. A., & Birmingham, C. L. (1998). Shape and weight based self-esteem and the eating disorders. *International Journal of Eating Disorders*, 24, 285-298.

Gemar, M. C., Segal, Z. V., Sagrati, S., & Kennedy, S. J. (2001). Mood-induced changes on the implicit associations test in recovered depressed patients. *Journal of Abnormal Psychology*, 110(2), 282-289.

Grabhorn, R., Stenner, H., Kaufhold, J., Overbeck, G., & Stangier, U. (2005). Shame and social anxiety in anorexia and bulimia nervosa. *Zeitschrift für Psychosomatische Medizin and Psychotherapie*, 51(2), 179-193.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem and stereotypes. *Psychological Review*, 102, 4-27.

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellot, D. S. (2002). A unified theory of implicit attitudes,

- stereotypes, self-esteem, self-concept. *Psychological Review*, *109*, 3-25.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*, 1022-1038.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology*, *74*, 1464-1480.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit associations test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197-216.
- Haaga, D. A. F., Dyck, M. J., & Ernst, D. (1991). Empirical status of cognitive theory of depression. *Psychological Bulletin*, *110*, 215-236.
- Henderson, M., & Freeman, C. P. L. (1987). A self-rating scale for Bulimia: The BITE. *British Journal of Psychiatry*, *150*, 18-24.
- Hsu, L., Crisp, A. H., & Callender, J. S. (1992). Recovery in anorexia nervosa: the patient's perspective. *International Journal of Eating Disorders*, *11*, 341-350.
- Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology*, *85*(5), 969-978.
- Karpinski, A. (2005). Measuring self-esteem using the implicit association test: the role of the other. *Personality and Social Psychology Bulletin*, *30*(1), 22-34.

- Kernis, M. H. (2003). Toward a conceptualisation of optimal implicit self-esteem. *Psychological Inquiry, 14*, 1-26.
- Kernis, M. H., Abend, T. A., Goldman, B. M., Shrira, I., Paradise, A. N., & Hampton, C. (2005). Self-serving responses arising from discrepancies between explicit and implicit self-esteem. *Self and Identity, 4*, 311-330.
- Kernis, M. H., Greenier, K. D., Herlocker, C. E., Whisenhunt, C. R., & Abend, T. A. (1997). Self-perceptions of reactions to doing well or poorly: the roles of stability and level of self-esteem. *Personality and Individual Differences, 22*, 845-854.
- Kernis, M. H., Paradis, A. W., Whitaker, D. J., Wheatman, S. R., & Goldman, B. N. (2000). Master of one's psychological domain? Not likely if one's self-esteem is unstable. *Personality and Social Psychology Bulletin, 26*, 1297-1305.
- Koole, S. L., Dijksterhuis, A., van Knippenberg, A. (2001). What's in a name: implicit self-esteem and the automatic self. *Journal of Personality and Social Psychology, 80*, 669-685.
- Macromedia (2006). Authorware (version 7.0) [computer software]. San Francisco, CA: Macromedia, Inc.
- Mattick, R. P., & Clark, J. C. (1997). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy, 36*, 455-470.
- McManus, F., Waller, G., & Chadwick, P. (1996). Biases in the processing of different forms of threat in bulimic and comparison women. *Journal of Nervous and Mental Disease, 184*(9), 547-554.

- Meijboom, A., Jensen, A., Kampman, M., & Schouten, E. (1999). An experimental test of the relationship between self-esteem and concern about body shape and weight in restrained eaters. *International Journal of Eating Disorders, 25*, 327-334.
- National Collaborating Centre for Mental Health (2004). *Eating Disorders. Core Interventions in the Treatment and Management of Anorexia Nervosa, Bulimia Nervosa and Related Eating Disorders*. British Psychological Society and Royal College of Psychiatrists.
- Newns, K., Bell, L., & Thomas, S. (2003). The impact of a self-esteem group people with eating disorders: an uncontrolled study. *Clinical Psychology and Psychotherapy, 10*, 64-68.
- Peterson, G., & Rosenvinge, J. H., (2002). Improvement and recovery from eating disorders: A patient perspective. *Eating Disorders, 10*(1), 61-72.
- Raedt, R., Schacht, R., Franck, E., & De Houwer, J. (in press). Self-esteem and depression revisited: implicit positive self-esteem in depressed patients? *Behaviour Research and Therapy*.
- Roefs, A., & Jansen, A. (2002). Implicit and explicit attitudes to high fat foods in obesity. *Journal of Abnormal Psychology, 111*(3), 517-521.
- Rorty, M., Yager, J., & Rossotto, E. (1993). Why and how do women recover from bulimia nervosa? The subjective appraisals of forty women recovered for a year or more. *International Journal of Eating Disorders, 14*, 249-260.
- Rosenberg, M. (1965). *Society and Adolescent Self-image*. Princeton: Princeton University Press.

- Rosenberg, M. (1969). The conditions and consequences of evaluation apprehension. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in Behavioral Research* (pp. 279-349). New York: Academic Press.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behaviour: the psychological functions of self-esteem and cultural worldviews. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (pp. 91-159). San Diego: Academic Press.
- Spalding, L. R., & Hardin, C. D. (1999). Unconscious unease and self-handicapping: behavioural consequences of individual differences in implicit and explicit self-esteem. *Psychological Science*, *10*, 535-539.
- Steffens, M. C., & Plewe, I. (2001). Items' cross-category associations as a confounding factor in the implicit associations test. *Zeitschrift für Experimentelle Psychologie*, *48*, 123-134.
- Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1993). The social self in bulimia nervosa: public self-consciousness, social anxiety, and perceived fraudulence. *Journal of Abnormal Psychology*, *102*(2), 297-303.
- Swann, W. B. & Shroeder, D. G. (1995). The search for beauty and truth: A framework for understanding reactions to evaluations. *Personality and Social Psychology Bulletin*, *21*, 1307-1318.
- Tanner, R., Stopa, L., & De Houwer, J. (2005). *Implicit views of the self in social anxiety*. Manuscript submitted for publication.

- Tennen, H., & Affleck, G. (1993). The puzzles of self-esteem: a clinical perspective. In R. F. Baumeister (Ed.), *Self-esteem: The Puzzle of Low Self-regard* (pp. 241-262). New York: Plenum Press.
- Terry-Short, L. A., Owens, R. G., Slade, P. D., & Dewey, M. E. (1994). Positive and Negative Perfectionism. *Personal and Individual Differences, 18*(5), 663-668.
- Troop, N. A., Schmidt, U. H., Turnbull, S. J., & Treasure, J. L. (2000). Self-esteem and responsibility for change in recovery from bulimia nervosa. *European Eating Disorders Review, 8*(5), 384-393.
- Turnbull, S. J., Schmidt, U. H., Troop, N. A., Tiller, J. M., Todd, G., & Treasure, J. L. (1997). Predictors of outcome for two treatments for bulimia nervosa: short and long term. *International Journal of Eating Disorders, 21*, 17-22.
- Vartanian, L. R., Polivy, J., & Herman, C. P. (2004). Implicit cognitions and eating disorders: their application in research and treatment. *Cognitive and Behavioral Practice, 11*, 160-167.
- Vitousek, K. M. (1996). The current status of cognitive-behavioural models of anorexia nervosa and bulimia nervosa. In P. M. Salkovskis (Ed.), *Frontiers of Cognitive Therapy* (pp. 383-418). New York, US: Guilford Press.
- Vitousek, K. M., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research, 14*, 191-214.

- Waller, G., Ohanian, V., Meyer, C., & Osman, S. (2000). Cognitive content among bulimic women; the role of core beliefs. *International Journal of Eating Disorders, 28*, 235-241.
- Weber, S. J., & Cook, T. D. (1972). Subject effects in laboratory research: An examination of subject roles, demand characteristics, and valid inference. *Psychological Bulletin, 77*, 273-295.
- Wilson, T. D., Lindsay, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*, 101-126.
- Yellowlees, A. (1997). *Working with Eating Disorders and Self-esteem*. Folens Limited: Dunstable and Dublin.
- Young, J. E. (1994). *Cognitive Therapy for Personality Disorders: A Schema Focused Approach*. Sarasota: Professional Resource Press.
- Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: implications for narcissism and self-esteem instability. *Journal of Personality, 74*(1), 119-143.

APPENDICES

Appendix A - School of Psychology Ethics Committee Approval Letter**School of Psychology**

University of Southampton Tel +44 (0)23 8059 3995
Highfield Southampton Fax +44 (0)23 8059 4597
SO17 1BJ United Kingdom

20 May 2005

Elaine Cockerham
3 Victoria Road
Cowes
Isle of Wight
PO31 7JG

Dear Elaine,

Re: Investigating the role of implicit self-esteem in eating disorders

I am writing to confirm that the above titled ethics application was approved by the School of Psychology Ethical Committee on 16 May 2005.

Should you require any further information, please do not hesitate in contacting me on 023 8059 3995.

Please quote approval reference number CLIN/03/74.

Yours sincerely,



Kathryn Smith
Secretary to the Ethics Committee

Appendix B – COREC Approval Letter



STA

29 July 2005

Miss Elaine S Cockerham
 Trainee Clinical Psychologist (DClinPsych)
 Taunton and Somerset NHS Trust
 University of Southampton
 Highfield
 Southampton
 SO17 1BJ

SOUTHAMPTON & SOUTH WEST HAMPSHIRE RESEARCH ETHICS COMMITTEES (B)

1ST Floor, Regents Park Surgery
 Park Street, Shirley
 Southampton
 Hampshire
 SO16 4RJ

Tel: 023 8036 2466
 023 8036 3462
 Fax: 023 8036 4110

Email: GM.E.hio-au.SWHRECB@nhs.net

Dear Miss Cockerham

Full title of study: Investigating the Role of Implicit Self-esteem in Eating Disorders
REC reference number: 05/Q1704/73

Thank you for your letter of 15 July 2005, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

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.

The favourable opinion applies to the research sites listed on the attached form.

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 May 2005
Investigator CV		20 May 2005
Protocol	2	11 April 2005
Summary/Synopsis Protocol Flow Diagram	2	25 May 2005
Letter from Sponsor - Peter Hooper		19 May 2005
Letter from Sponsor - Dr C Brignell, School of Psychology		19 May 2005
Peer Review		04 April 2005
Compensation Arrangements Insurance		19 May 2005
Interview Schedules/Topic Guides - SCID-I		(None Specified)
Copy of Questionnaire - BDI-II		(None Specified)
Copy of Questionnaire Bulimic Inventory Test, Edinburgh		(None Specified)

Copy of Questionnaire - SAWBS Inventory - Adult		(None Specified)
Copy of Questionnaire -PANPS		(None Specified)
Copy of Questionnaire - Rosenberg Self-Esteem Scale		(None Specified)
Copy of Questionnaire - MATTICK --SIAS		(None Specified)
Copies of Advertisements - Poster	2	25 May 2005
Copies of Advertisements - Newspaper Advert	2	25 May 2005
Participant Information Sheet	3	15 July 2005
Participant Consent Form	4	15 July 2005
Response to Request for Further Information		15 July 2005
Reply Slip	1	(None Specified)
Debriefing Statement	4	15 July 2005
Debriefing Information	4	15 July 2005
Lusia Stopa's CV - Edu. Supervisor		20 May 2005
Letter of Approval from the School of Psychology		20 May 2005
Submission to the School of Psychology Ethics Committee		29 April 2005
Research Governance Application		18 April 2005
Statement of Main Terms and conditions of Employment		07 October 2003

Management approval

The study should not commence at any NHS site until the local Principal Investigator has obtained final management approval from the R&D Department for the relevant NHS care organisation.

Notification of other bodies

The Committee Administrator will notify the research sponsor that the study has a favourable ethical opinion.


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.

REC Reference: 05/Q1704/73	Please quote this number on all correspondence
-----------------------------------	---

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

Yours sincerely


 Dr Raj Patel
 Chair

Email: GM.E.hio-au.SWHRECB@nhs.net

Enclosures:

Standard approval conditions
 Site approval form (SF1)

SF1 list of approved sites

An advisory committee to Hampshire and Isle of Wight Strategic Health Authority

Appendix C – Poster Advert

(RECRUITING NOVEMBER 2005 – JANUARY 2006)

Research Participants Wanted

People with eating difficulties wanted to take part in a study looking at computerised reaction times and attitudes and beliefs about the self.

The research session will last for approximately one hour and will take place at the University of Southampton.

It will involve a computer task, a short interview and completion of six short self report questionnaires.

If you have *Bulimia Nervosa* or *Binge Eating Disorder* and think you might be interested in taking part in this study, for further information contact:

Elaine Cockerham at the University of Southampton on: 07762162024 or email esc203@soton.ac.uk

Appendix D – Participant Information Sheet



School of Psychology

Doctoral Programme in Clinical Psychology

University of Southampton	Tel	+44 (0)23 8059 5321
Highfield	Fax	+44 (0)23 8059 2588
Southampton	Email	
SO17 1BJ	United Kingdom	

Participant Information Sheet

1. Study Title

'Beliefs about the self'

2. Invitation paragraph

You are being asked to participate in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

3. What is the purpose of the study?

The study is trying to find out about the attitudes and beliefs of people with eating difficulties compared to people without eating difficulties. It is hoped that such research will help people working in health care settings gain a better understanding of the difficulties people with eating difficulties might have.

4. Why have I been chosen?

In order to gain a number of opinions, a variety of individuals have been selected.

5. What are the possible risks of taking part?

Occasionally, people can become upset when filling in questionnaires and thinking about issues related to eating, weight and shape. You will have the right to stop participating in the research at any point. You will also have the opportunity to do some relaxation exercises at the end of the session if you want to. I will also debrief you immediately at the end of the session and will provide you with details of where to obtain further help if you require it.

6. Will I benefit from taking part?

You may or may not receive any direct benefit from taking part in the study. However, information obtained during the course of the study may help us to understand eating difficulties better, which may help us to develop better treatment approaches in the future.

7. Do I have to take part?

It is up to you to decide if you wish to take part or not. Even if you do decide to take part you are free to withdraw at any time without giving a reason. If you chose to withdraw you will not suffer any consequences and no-one will be upset or disappointed.

8. What will happen if I take part?

You will be asked to attend one research session which will last for approximately one hour. During this time you will first be asked to complete a reaction time computer task, which involves looking at words and pressing appropriate computer keys depending on the word that appears on the screen. I will then ask you a few structured interview questions and finally you will be asked to fill out 6 short self-report questionnaires.



**University
of Southampton**

School of Psychology

Doctoral Programme in Clinical Psychology

University of Southampton	Tel	+44 (0)23 8059 5321
Highfield	Fax	+44 (0)23 8059 2588
Southampton	Email	
SO17 1BJ, United Kingdom		

9. Will my taking part in the study be kept confidential?

All information which is collected during the research will be kept strictly confidential. The results of this study will not include any personal identifying information, for example name, address, or date of birth.

10. What will happen to the results of this study?

A report of the study will be written. A summary of the results will be made available on request.

11. Who is organising and funding the research?

The Clinical Psychology Department at the University of Southampton.

12. Who has reviewed the study?

The University of Southampton ethics committee, and Southampton and South West Hampshire Local Research Ethics Committee.

If you have any questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you can contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17, 1BJ.
Telephone: (023) 8059 3995.

Contact for further information

If you have any questions or wish to ask for any further information please contact:

Elaine Cockerham, Trainee Clinical Psychologist
Department of Clinical Psychology
University of Southampton
Highfield
Southampton
SO17 1BJ
Tel: 023 80595321
esc203@soton.ac.uk

**Thank you for reading this information and for considering
taking part in this study.**

You will be given a copy of the participant information sheet
and a copy of your signed consent form to keep

Appendix E – Consent Form



Centre number:
Study number:
Patient Identification number:

School of Psychology

Doctoral Programme in Clinical Psychology

University of Southampton Tel +44 (0)23 8059 5321
Highfield Fax +44 (0)23 8059 2588
Southampton Email
SO17 1BJ United Kingdom

CONSENT FORM

Title of Project: 'Beliefs about the self'

Name of researcher: Elaine Cockerham

Please initial box

1. I confirm that I have read and understand the participant information sheet dated the 15th July 2005 (version 3) for the above study and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.

3. I agree to take part in the above study.

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

1 copy for the participant; 1 to be kept by the researcher

Appendix F – Debriefing Form



School of Psychology

Doctoral Programme in Clinical Psychology

University of Southampton	Tel	+44 (0)23 8059 5321
Highfield	Fax	+44 (0)23 8059 2588
Southampton	Email	
SO17 1BJ	United Kingdom	

Debriefing Statement

Title of Study: 'Beliefs about the self'

Name of researcher: Elaine Cockerham

The aim of this research was to investigate whether people with eating difficulties have low levels of implicit self-esteem, which was measured using the computer task. Implicit self-esteem is considered to occur automatically and unconsciously, whereas explicit self-esteem is believed to be conscious and controlled and is usually measured using self-report questionnaires. We would expect people with eating difficulties to have lower levels of implicit self-esteem compared to people without eating difficulties. We would also expect people with eating difficulties to have lower levels of explicit self-esteem. Your participation may help further our understanding about what contributes to the development of eating difficulties and could help to develop treatments. Once again results of this study will not include your name or any other identifying characteristics.

(Please circle yes or no)

You may have a copy of this summary if you wish.

YES **NO**

You may also have a summary of the research findings once the research is completed if you wish.

YES **NO**

If you have any further questions, please contact me, Elaine Cockerham at the:

University of Southampton
Highfield
Southampton
SO17 1BJ
Tel: 023 80595321
esc203@soton.ac.uk.

Signature:

Date:

Name: Elaine Cockerham

Thank you for your participation in this research.

If you have any questions about your rights as a participant in this research, or you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Telephone: (023) 8059 3995

Appendix G – Debriefing Information

Debriefing Information

Title of Study: 'Beliefs about the self'

Name of researcher: Elaine Cockerham

Contact details: University of Southampton, Highfield, Southampton, SO17 1BJ. Tel: 023 80595321. esc203@soton.ac.uk.

In case you have any concerns about low self-esteem, eating, weight or shape that causes you distress or interferes with your life and wish to access further information, advice and/or support:

1. You could contact your GP and ask to be referred on to appropriate services.
2. If you are already receiving help or have a named therapist you should contact them or discuss this with them at your next meeting.
3. University students can access the counselling service by calling 023 8059 3717.
4. The Samaritans are available 24 hours per day. Telephone 08457 90 90 90.

A number of good self-help books are also available to help with eating difficulties. For example:

- Cooper, M. et al. (2000). *Bulimia Nervosa. A Cognitive Therapy Programme for Clients*. Jessica Kingsley Publishers.
- Fairburn, C. G. (1995). *Overcoming Binge Eating*. New York: Guilford Press.
- Fennell, M. (1999). *Overcoming Low Self-Esteem: A Self-Help Guide Using Cognitive Behavioural Techniques*. London: Robinson Publishing.

Appendix H – IAT Block Presentation

Left Hand Response Category (Q key)	Categorisation Word: Presented randomly one at a time.	Right Hand Response Category (P key)
---	--	--

Test Block 1 (24 trials):

NEGATIVE	Words appear from either the 'negative' or 'positive' attribute word list	POSITIVE
----------	---	----------

Test Block 2 (24 trials):

NOT ME	Words appear from either the 'other' or 'self' attribute list	ME
--------	--	----

Measurement Block 1 (49 trials):

NEGATIVE or NOT ME	Words appear from any of the four categories	POSITIVE or ME
--------------------------	---	----------------------

Test Block 3 (24 trials):

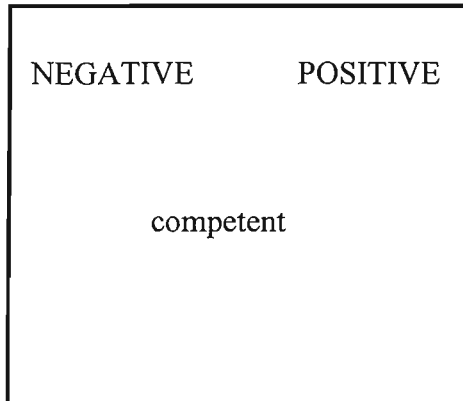
ME	Identical to test block 2, except the position of the target words are reversed	NOTME
----	---	-------

Measurement Block 2 (49 trials):

NEGATIVE or ME	Identical to measurement block 1, except the target words are reversed	POSITIVE or NOTME
----------------------	--	-------------------------

Appendix I - Example IAT Block Presentations

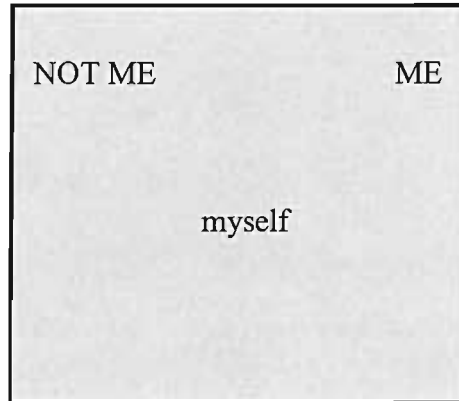
1) Test block 1



Q key

P key

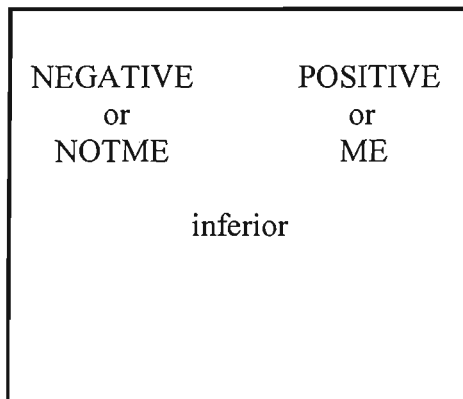
2) Test block 2



Q key

P key

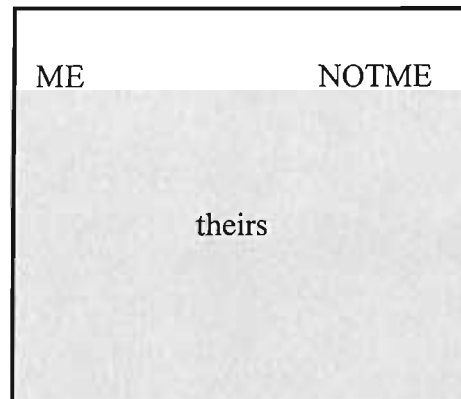
3) Measurement block 1



Q key

P key

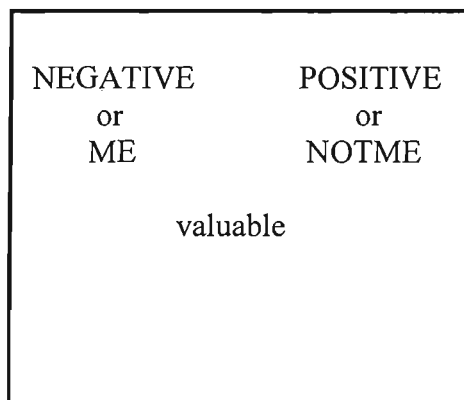
4) Test block 3



Q key

P key

5) Measurement block 2



Q key

P key