UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

School of Psychology

Volume I of I

The Impact of Self-Imagery on the Self-Concept in Eating Disorders

By

Jodie Camilla Harlowe

Thesis for the Degree of Doctor of Clinical Psychology

May 2015

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF SOCIAL AND HUMAN SCIENCES

School of Psychology

Thesis for the Degree of Doctor of Clinical Psychology

THE IMPACT OF SELF-IMAGERY ON THE SELF-CONCEPT IN EATING DISORDERS

Jodie Camilla Harlowe

The transdiagnostic model (Fairburn, Cooper, & Shafran, 2003) suggests that a subset of individuals with eating disorders have 'core low self-esteem', defined as global negative views of the self, which plays a key role in the maintenance of eating disorder pathology. In the first section of this thesis, the literature investigating whether adult females with eating disorders have 'core low self-esteem' is systematically reviewed, and the conceptualisation of 'core low self-esteem' in this population is critiqued. The empirical evidence suggests that 'core low self-esteem' is characteristic of females with eating disorders when it is conceptualised as an explicit uni-dimensional construct. However, when core self-esteem is considered as a two-dimensional construct or an unconscious, intuitive process (implicit self-esteem), the findings regarding levels of self-esteem in individuals with eating disorders become mixed. The review also considers whether levels of core self-esteem vary between different eating disorder subgroups and if 'core low self-esteem' is associated with specific eating disorder symptomology. The importance of incorporating techniques that improve 'core low self-esteem' in eating disorder

treatment protocols is discussed and the methodological limitations of the studies included in the review are considered. Finally, recommendations for future research are made.

The empirical paper aimed to develop previous literature by exploring whether individuals with, or at high risk of, eating disorders can access positive images of the whole self. The study also investigated whether retrieving positive or negative images of the whole self had an impact on different aspects of the self-concept. Previous research hypothesises that self-images represent an individual's current working self (Farrar, Stopa, & Turner, 2015; Hulme, Hirsch, & Stopa, 2012). In accordance with this hypothesis, the current study found that accessing positive and negative self-images was associated with the retrieval of different working self-concepts. Specifically, retrieving a positive self-image resulted in an increase in positive state self-esteem and positive affect, and a decrease in negative state self-esteem, state self-concept clarity, actual-ideal self-discrepancies and negative affect. In comparison, retrieving a negative self-image resulted in an increase in negative state self-esteem, actual-ideal self-discrepancies and negative affect, and a decrease in positive state self-esteem and positive affect. The potential role of negative self-imagery in the maintenance of eating disorder pathology is discussed in relation to the transdiagnostic model (Fairburn et al., 2003). The use of positive self-imagery techniques in clinical interventions with individuals with eating disorders is considered and finally, future research recommendations are made.

Table of Contents

List of Tables

List of Figures

DECLARATION OF AUTHORSHIP

I, Jodie Harlowe, declare that this thesis and the work presented in it are my own, and has been generated by me as the result of my own original research.

The Impact of Self-Imagery on the Self-Concept in Eating Disorders

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree as this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signed:…….

Date:…….

Acknowledgements

Firstly, I would like to thank all of the participants who took the time to take part in this project. Without their participation this research would not have been possible. My sincere thanks goes to my supervisors, Dr Lusia Stopa, Dr Hannah Turner and Dr Stephanie Farrar, for their availability, support and guidance throughout this process. I would like to express special thanks to Steve, for always being there and for making me laugh when I took things too seriously. I would like to say a big thank you to my mum and dad for their endless love, patience, and encouragement. Finally, I would like to thank my wonderful cohort for their support throughout the course; it has been a pleasure completing this journey with you.

CHAPTER 1: SYSTEMATIC REVIEW

Do Adult Females with Eating Disorders have Low Global Self-Esteem?

1.1 Introduction

Historically, cognitive models of eating disorders (e.g., Fairburn, Cooper, & Cooper, 1986; Fairburn, Shafran, & Cooper, 1999) have predominantly focused on the distinctive eating disorder cognitions related to eating, weight and shape (e.g., negative automatic thoughts, dysfunctional assumptions) to understand and treat eating disorder psychopathology. However, given the modest effectiveness of treatment protocols associated with these early models (e.g., Fairburn et al., 1995), the recent transdiagnostic model (Fairburn, Cooper, & Shafran, 2003) identified four additional mechanisms that may, for some individuals, play a role in the maintenance of eating disorders and thus need to be focused on in treatment to improve clinical outcomes. One of these mechanisms is 'core low self-esteem' and Fairburn et al. (2003) propose that individuals with global negative views of the self (known as 'core low self-esteem') find it particularly difficult to engage in therapy, reducing the likelihood of recovery.

In accordance with this theoretical development, this review will initially provide an overview of the transdiagnostic model of eating disorders, with a particular focus on the role of 'core low self-esteem' in the maintenance of eating disorder symptomology. The review will then consider previous meta-analyses that have investigated global self-esteem in an eating disordered population. The meta-analyses highlight that research investigating the presence and conceptualisation of

global self-esteem in individuals with eating disorders has never been systematically reviewed. This review therefore has three main aims. Firstly, to review the empirical evidence to establish whether adult females with eating disorders have 'core low self-esteem', and to critically review the literature to assess how 'core low self-esteem' has been conceptualised in this population. A secondary aim of this review is to examine whether levels of 'core low self-esteem' differ between people with Anorexia Nervosa (AN), Bulimia Nervosa (BN) and atypical eating disorders (e.g., Eating Disorders Not Otherwise Specified [EDNOS], Other Specified Feeding and Eating Disorders [OSFED]). A third aim of the review is to extract findings from the literature that may contribute to our understanding of the relationship between 'core low self-esteem' and eating disorder symptomology. This information may help clinicians identify which eating disordered individuals are likely to present with 'core low self-esteem', enabling it to be addressed early on in therapy. This review is imperative to improve our understanding of global self-esteem in eating disorders. The clinical implications related to this review will finally be discussed and recommendations for future research will be made.

1.1.1 The Transdiagnostic Model of Eating Disorders (Fairburn et al., 2003)

The transdiagnostic model extended the eating disorder literature in two key ways. Firstly, it suggested that AN, BN and EDNOS can be viewed as a single diagnostic category rather than as separate disorders; and secondly, it proposed four additional maintaining mechanisms that may, for some individuals, need to be addressed in therapy to increase the chance of recovery. These two developments will now be discussed in turn.

Despite the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, [APA], 1994; 2000; 2013) distinguishing between AN, BN and EDNOS, known as OSFED in the current version of the DSM (APA, 2013), Fairburn et al. (2003) argue that individuals with any of these three diagnoses essentially share the same distinctive eating disorder psychopathology, at a similar level of severity, and can migrate between the three diagnoses over time. They therefore suggest that eating disorders can be viewed as a single diagnostic category. Individuals with AN, BN and EDNOS/OSFED will therefore be the focus of this review.

Fairburn et al. (2003) propose that the distinctive core psychopathology that patients with eating disorders share is the cognitive component of over-evaluation of eating, shape and weight and their ability to control these factors. Fairburn et al. (2003) also argue that patients with AN, BN and EDNOS express this psychopathology through similar attitudes and behaviours. For example, patients in all three diagnostic groups are intensely concerned about their weight, individuals with AN restrict their dietary intake in the same rigid and extreme way as individuals with BN, and all three groups engage in compensatory behaviours (e.g., vomiting or over-exercising) in an attempt to control their eating, shape and weight and prevent weight gain.

To further their argument for eating disorders to be viewed as a single diagnostic category, Fairburn et al. (2003) recognised that eating disordered patients often migrate between diagnostic categories over time. Taking a longitudinal perspective they highlight how BN often begins as AN or EDNOS (e.g., Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000), that a typical outcome of BN is a

longstanding EDNOS (e.g., Fairburn et al., 1995) and that EDNOS is a common outcome of AN (e.g., Sullivan, Bulik, Fear, & Pickering, 1998).

In addition to arguing for a transdiagnostic view of eating disorders, Fairburn et al. (2003) proposed four additional maintaining processes that may play a role in the maintenance of eating disorders. These include (i) the impact of 'clinical perfectionism', (ii) the influence of unconditional and pervasive 'core low self-esteem', (iii) difficulty managing intense mood states known as 'mood intolerance' and (iv) 'interpersonal difficulties' that can perpetuate eating disorders. Given that unconditional and pervasive negative views of the self, known as 'core low self-esteem', can prevent individuals from fully engaging in treatment and consequently prolong the eating disorder and its associated damaging effects (e.g., osteoporosis, irregular menstrual cycle, low blood pressure; Fairburn, 2008), the remainder of this review will only focus on the role of 'core low self-esteem' in the maintenance of eating disorders. [1]

The transdiagnostic model (Fairburn et al., 2003) proposes that although the majority of people with eating disorders are self-critical about their ability to control their eating, shape and weight, a form of negative self-evaluation that usually reverses with effective treatment (Fairburn et al., 1993), a subset of individuals with eating disorders have more global negative views of themselves, which is part of their permanent identity ('core low self-esteem'). Fairburn et al. (2003) suggest that these global negative views are autonomous and independent of performance meaning they are less affected by changes in the eating disorder, and not explained by the presence of clinical depression.

[1] Readers are directed to Fairburn and colleagues (2003) paper for further explanation of the role of the three other maintaining processes detailed in the transdiagnostic model.

Although it is useful that Fairburn et al. (2003) provide a definition of 'core low self-esteem', their description is very simplistic and suggests limited understanding of self-esteem in eating disorders. Their description of this concept appears to refer to explicit self-esteem (conscious, accessible beliefs about the self), however, this is not made clear and they fail to acknowledge the presence or role of implicit self-esteem (unconscious, automatic attitudes about the self), which has also been found to contribute to an individual's view of their own self-worth (Greenwald & Farnham, 2000). Fairburn et al. (2003) also fail to specify how 'core low self-esteem' should be conceptualised within a cognitive framework. The limited understanding of self-esteem in this model becomes particularly apparent when compared to the conceptualisation of self-esteem provided in models of social psychology e.g., Cast and Burke (2002) and Conway and Pleydell-Pearce (2000).

Despite these limitations, Fairburn et al.'s definition of 'core low self-esteem' seems to conceptually map onto the general definition of 'global self-esteem' which is most commonly described in the literature as an overall evaluation of, or an attitude towards, the self which is enduring across time and situations (Brown & Marshall, 2006; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). This global form of self-esteem is conceptually different to the terms 'self-evaluation' and 'self-worth', which are often used interchangeably with the term

self-esteem in the literature.[2] One therefore assumes that Fairburn et al. (2003) use the term 'core low self-esteem' to describe low global self-esteem in its broadest form. This understanding will therefore be adopted throughout this review and the terms global self-esteem and core self-esteem will be used interchangeably.

Given that 'core low self-esteem' may maintain eating disorder pathology (Fairburn et al., 2003), clinical interventions that specifically target low global self-esteem are likely to improve the outcome of treatment. Fairburn et al. (2003) propose that 'core low self-esteem' creates hopelessness in patients about their capacity to change resulting in them seeing little or no prospect of recovery. Patients therefore fail to fully engage with treatment, reducing the likelihood of change occurring. Fairburn et al. (2003) also propose that the intensity of the patients' 'core low self-esteem' results in them striving, with particular determination, for achievement in their most valued domain namely, control over their eating, shape and weight. This makes it particularly difficult for individuals to make positive changes in any of these areas and consequently maintains the eating disorder. This state is also self-perpetuating as these individuals show particularly pronounced negative cognitive processing biases and over-generalisations, therefore any perceived failure, no matter

[2] Instead of the overall pervasive evaluation of the self used to describe global self-esteem, 'self-evaluation', also referred to as specific self-esteem in the literature, refers to a person's attitudes towards specific aspects of the self (e.g., their specific abilities or personality attributes such as academic self-esteem or body self-esteem), and 'self-worth' is defined as momentary emotional states that occur following a positive or negative outcome (e.g., feeling proud of ourselves after getting a promotion at work; Brown & Marshall, 2006).

how minor, is interpreted as confirmation that they are failures as people thereby reaffirming their overall negative sense of self (Fairburn et al., 2003).

The proposed role of self-esteem in the maintenance of eating disorders in this model is supported by research that indicates that patients with low self-esteem respond particularly poorly to treatment (e.g., Fairburn, Kirk, O'Connor, Anastasiades, & Cooper, 1987). Another strength of the transdiagnostic model is that it can be applied to patients with AN, BN and EDNOS, meaning it can be widely used in clinical practice. This model was also designed to supplement existing models frequently used in clinical practice (e.g., Fairburn, Marcus, & Wilson, 1993) to help conceptualise cases that are resistant to change and thus may benefit from a different approach. This means that the model does not compete with other approaches, but instead aims to augment clinical practice and acknowledges that 'core low self-esteem' may not always be an essential target for treatment. However, a limitation of this model is that it does not consider the role of 'core low self-esteem' in the development of eating disorders. Research suggests that low self-esteem may predate the onset of eating disorders (e.g., Fairburn, Cooper, Doll, & Welch, 1999). Therefore, it would be beneficial for future models to consider how 'core low self-esteem' may be involved in eating disorder development.

Given the importance of 'core low self-esteem' in Fairburn et al.'s (2003) transdiagnostic model of eating disorders, we need to establish whether individuals with eating disorders do routinely have lower levels of core self-esteem than comparable individuals without eating disorders. The following section reviews previous meta-analyses that have made this comparison.

1.1.2 Previous Meta-Analyses

Although it is a commonly held assumption that self-esteem has a central role in the development and maintenance of eating disorders, to date there have been limited attempts to review the published literature. Three previous meta-analyses (Caglar-Nazali et al., 2014; Jacobi, Hayward, de Zwaan, Hayward, Kraener, &Agras, 2004; Vince & Walker, 2007) have very briefly considered self-evaluations in eating disorders, however this was in the context of much broader reviews. Jacobi et al. (2004) reviewed cross-sectional and longitudinal studies to establish putative risk factors for eating disorders. They found that negative self-evaluation was a risk factor for the onset of eating disorders. In a review of the facets of social processing involved in eating disorders, Caglar-Nazali et al. (2014) also found that people with eating disorders had negative self-evaluation. Given that both of these meta-analyses assessed negative self-evaluation by reviewing the results of studies that measured a wide variety of self-concept domains (e.g., self-competence, self-esteem, ineffectiveness, attractiveness etc.,), they were unable to specifically comment on whether individuals with eating disorders have lower global self-esteem than comparable individuals without eating disorders. These two meta-analyses assessed self-evaluation in males and females with AN, BN, Binge Eating Disorder (BED) and EDNOS. However, given that eating disorders can present differently in males and females (Andersen, 1999), Vince and Walker (2007) only included data from female participants in their meta-analysis investigating factors associated with the presence of disturbed eating, AN and BN. They found that women with AN (r = .47), but not disturbed eating (r = .03) or BN (r = -.01), were more likely to have lower self-esteem than healthy female controls. However, the studies reviewed in this meta-analysis included measures of self-efficacy, body esteem and self-esteem,

meaning that self-esteem was assessed in its broadest form. Similar to Jacobi et al. (2004) and Caglar-Nazali et al. (2014), this meta-analysis failed to separate the studies assessing global self-esteem to those assessing other aspects of the self-concept. Therefore, little is currently known about levels of global self-esteem in people with eating disorders. A further limitation of Vince and Walker's (2007) meta-analysis is that it only incorporated studies that included self-report questionnaires, limiting the findings. Another weakness, consistent across all three meta-analyses, is that they only included studies that compared people with eating disorders to healthy controls. No systematic review to date has considered whether there is a difference in levels of self-esteem between patients with AN, BN or EDNOS. This is a necessary question to address in order to successfully tailor psychological interventions to each clinical group and will be considered in the current review. An additional limitation of the three meta-analyses discussed is that they combined the results of studies that assessed levels of self-esteem in adults and adolescents. Given that the nature of the self changes dramatically from infancy through adolescence (Damon & Hart, 1982), future research needs to separately consider levels of global self-esteem in adolescents and adults with eating disorders, in order to effectively tailor clinical interventions to these two client groups. To address this gap, the current review will only consider the role of global self-esteem in adults with eating disorders.

1.1.3 Aims of Literature Review

Given the limitations of the previous meta-analyses (Caglar-Nazali et al., 2014; Jacobi et al., 2004; Vince & Walker, 2007), the current review represents a step forward in the literature as it is the first to investigate the presence and

conceptualisation of global self-esteem in adult females with a clinically diagnosable eating disorder using a systematic search strategy.

1.2 Method

1.2.1 Search Strategy

To identify relevant articles for this review a systematic search strategy was carried out in February 2015 on the following electronic databases: PsycInfo via Ebsco, Medline via Ovid and Web of Science (all databases). Articles containing any combination of the following search terms were retrieved: 'self-esteem' OR 'self-worth' OR 'self-evaluation' AND 'eating disorder*[3]' OR 'Anorexia Nervosa' OR 'Bulimia' OR 'Bulimia Nervosa'.

Titles and abstracts of retrieved articles were scrutinised according to pre-determined inclusion and exclusion criteria detailed in Table 1.

[3] Asterisks (*) indicate search terms where truncation was used (i.e., where the ending of the search term was replaced with * in order to find all forms of that word).

Table 1

Inclusion and Exclusion Criteria Employed to Identify Articles for the Current Review

Inclusion Criteria	Exclusion Criteria
1. The article was written in English.	1. The article was a meta-analysis, review article, dissertation or theoretical paper.
2. The article was published in a peer-reviewed journal.	2. The study was specifically evaluating the effectiveness of a treatment intervention.
3. The article reported results of an empirical study.	3. The participants in the sample/comparison group had recovered from an eating disorder.
4. The participants in the study were all female or where the study included both males and females the results relating to self-esteem were analysed separately for the two genders.	4. The primary diagnosis of the participants in the sample was BED, or if the study included participants with BED and participants with other diagnosable eating disorders the results of the groups were not analysed separately.
5. The mean age of the participants in the sample was between 18 and 65 years.	
6. At least one group in the study was clinically diagnosed with AN, BN or an atypical eating disorder (e.g., EDNOS or OSFED) at the time of the study and this was the primary diagnosis of the sample.	
7. The study included at least one of two comparison groups, (1) a non-clinical control group or (2) another eating disordered group, who were diagnosed with a different eating disorder to the first eating disordered group.	
8. The study included a measure of global self-esteem.	
9. There was a direct comparison between levels of global self-esteem in the eating disordered group and the comparison group.	

Full text articles were obtained if articles appeared to meet the inclusion criteria or if there was insufficient detail in the abstract to determine whether inclusion criteria were met.

Reference lists of full-text articles and previous meta-analyses in the field (e.g., Caglar-Nazali et al., 2014; Jacobi et al., 2004; Vince & Walker, 2007) were then inspected for additional articles that may be relevant and assessed against the inclusion criteria.

This search process identified 26 articles which are included in the current review. Please see Appendix A for a diagram detailing the systematic search process undertaken.

1.3 Results

The relevant methodological details of the studies included in this review are detailed in Table 2. Prior to discussing the findings of studies, the main assessment measures, and associated conceptualisations of self-esteem, used in the studies will be briefly described and evaluated to aid interpretation of the literature. The three aims of the review will then be addressed in turn.

1.3.1 Assessment of Self-Esteem

The issues in conceptualising global self-esteem are centred around two main areas: (i) its dimensionality, more specifically whether it is a unitary or multidimensional construct, and (ii) the level of conscious and unconscious processes involved in evaluating the self (Heatherton & Wyland, 2003). The challenge of measuring global self-esteem has further highlighted the difficulty of defining the construct (Heatherton & Wyland, 2003).

Global self-esteem is most commonly viewed in the literature as a uni-dimensional construct, conceptualised as the overall evaluation of, or attitude towards, the self (Rosenberg et al., 1995). This uni-dimensional account of self-esteem is supported by the majority of today's social and personality psychology research (e.g., Kernis, 2013; Robins, Hendin, & Trzesniewski, 2001). Given that the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is the most widely used measure of uni-dimensional self-esteem (Gray-Little, Williams, & Hancock, 1997), it is not surprising that 18 out of the 26 studies included in the current review utilised this measure. The RSE is a 10-item self-report questionnaire that provides one overall score representative of an individual's level of global self-esteem. A strength of the RSE is that it is a well-validated and standardised questionnaire (Gray-Little et al., 1997). It also has acceptable psychometric properties with eating disorder populations (Griffiths et al., 1999). However, it has been criticised for only assessing self-esteem as a uni-dimensional construct (Tafarodi & Swann, 2001).

Conceptual advances in the self-esteem literature (e.g., Tafarodi & Swann, 1995; 2001) have led to a debate as to whether global self-esteem is best understood as a uni-dimensional or multi-dimensional construct. Tafarodi and Swann, (1995; 2001), along with others (e.g., Gecas & Schwalbe, 1983; Harter, 1990), argue that self-esteem should be viewed in two dimensions. Specifically, Tafarodi and Swann (1995; 2001) suggest that individuals view themselves as globally acceptable-unacceptable (referred to as self-liking) and globally strong-weak (referred to as self-competence). In order to measure these two distinct global dimensions of self-esteem, Tafarodi and Swann (1995) developed the Self-Liking and Self-Competence Scale (SLCS) which specifically measures self-liking (SL) and self-competence (SC). They propose that SL is based on social feedback and social acceptance from

peers and is primarily subjective and affective in nature, whilst SC is based on the individual's interpretation of their performance outcome and is predominantly objective and cognitive in nature (Tafarodi and Swann, 1995). Two of the studies in this review utilised the SLCS. Although this measure provides an alternative way of conceptualising self-esteem in people with eating disorders, it is possible that the high correlation (r = 0.69) between the SL and SC subscales (Tafarodi and Swann, 2001) means that the questionnaire is actually measuring a uni-dimensional construct of self-esteem. A further limitation of the SLCS in the context of this review is that its psychometric properties have yet to be established in eating disorder populations.

The measures described above rely on self-report information and conceptualise self-esteem as a conscious process that happens through introspection and accessing beliefs about the self (Heatherton & Wyland, 2003). However, implicit self-esteem has been demonstrated as a concept distinct from explicit self-esteem (Bosson, Swann, & Pennebaker, 2000). Instruments thought to measure implicit self-esteem do not rely on self-report information but infer self-esteem from individuals' responses such as reaction times or memory biases e.g., the Self-Esteem Implicit Association Test (SE-IAT; Greenwald & Farnham, 2000). It has been suggested that unlike explicit measures, which may capture how individuals wish to present themselves, the implicit measures may provide a more realistic indication of an individual's global evaluation of the self. However, the evidence for this is mixed (Heatherton & Wyland, 2003).

In this review, two of the three studies that measured implicit self-esteem utilised the SE-IAT. The SE-IAT is a computerised reaction time task that measures the relative strengths of automatic associations between the target concepts *self* or *other* and attribute concepts *positive* or *negative*. The underlying assumption of the

SE-IAT is that when the associations presented are congruent with those stored in memory individuals will respond faster compared to when the associations presented are incongruent. Therefore, stronger associations between *self* and *positive* words (compared to *self* and *negative* words) result in higher positive IAT scores, which reflect higher positive implicit self-esteem (Greenwald, Nosek, & Banaji, 2003). The IAT has acceptable psychometric properties (Greenwald & Farnham, 2000). However, these have yet to be established within an eating disordered population.

Table 2

Characteristics of the Studies Retrieved on Global Self-Esteem in Eating Disordered Populations

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Bardone-Cone et al. (2010)	Cross-sectional questionnaire	Eating disorder (AN, BN and EDNOS)	53	Non-eating disordered controls	67	RSE	N/A	Individuals with eating disorders had significantly lower self-esteem than individuals without eating disorders ($p < .001$, $r = .69$).	No
Bers & Quinlan (1992)	Cross-sectional questionnaire	AN	13	Non-eating disordered controls	48	RSE	N/A	Individuals with AN had significantly lower self-esteem than controls ($p < .001$, $r = .79$).	No
Blechert, Ansorge, Beckmann, & Tuschen-Caffier (2011)	Cross-sectional questionnaire	AN BN	20 20	Healthy controls	28	RSE	N/A	Individuals with AN and BN had significantly lower self-esteem than healthy controls ($F = 16.5$, $p < .001$). There were no significant differences between levels of self-esteem in AN and BN patients.	No
Brockmeyer et al. (2012)	Cross-sectional questionnaire	AN	18	Healthy controls	30	RSE	Body weight	AN patients report lower levels of self-esteem compared to healthy controls ($p < .01$, $r = 0.72$). Body weight and self-esteem are significantly negatively correlated in AN patients ($r = -.64$, $p < .01$), but not healthy controls ($r = .04$, p = ns).	Yes – PHQ-9

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Cardi, Matteo, Gilbert, & Treasure (2014)	Cross-sectional	RAN BPAN BN	20 9 17	Healthy controls	50	SE-IAT	N/A	Individuals with eating disorders had significantly lower implicit self-esteem than healthy controls (*p* = .009, *r* = 0.64).	No
Cockell et al. (2002)	Cross-sectional questionnaire	AN	21	Healthy controls Psychiatric controls	21 17	RSE	N/A	Individuals with AN had significantly lower self-esteem than psychiatric controls, who had lower self-esteem than healthy controls ($F = 50.40$, $p < .001$).	No
Cockerham, Stopa, Bell, & Gregg (2009)	Cross-sectional	BN	17	Non-eating disordered controls	20	SE-IAT RSE	N/A	The BN group had significantly higher positive implicit self-esteem than the control group, $F(2,39) = 7.6$, $p < .01$, $r = .31$. Individuals with BN had significantly lower explicit self-esteem than the control group, $F(2,39) = 15.01$, $p < .001$, $r = .64$).	Yes – BDI-II
Cooper & Turner (2000)	Cross-sectional questionnaire	AN	18	Dieters Non-dieting healthy controls	18 18	RSE	N/A	Patients with AN had significantly lower self-esteem than the two control groups ($p < .001$). There was no significant difference between the two control groups on level of self-esteem (*p* = ns).	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Corte & Stein (2005)	Longitudinal	AN BN	12 29	Sub-threshold AN Sub-threshold BN	14 24	RSE adapted to measure State Self-esteem (Kermis, Grannemann, & Mathis, 1991).	N/A	The average state self-esteem scores were not significantly different between the four groups, indicating that state self-esteem was similar for patients with AN, BN and sub-threshold AN and BN.	No
Daley, Jimerson, Heatherton, Metzger, & Wolfe (2008)	Cross-sectional	BN	22	Healthy controls	42	SSES	EAT-26 Restraint Scale Frequency of self-reported binge eating and self-induced vomiting.	Total state self-esteem scores were significantly lower in the BN group compared to the control group ($p < .001$ $r = .71$). In the BN group, SSES total score was not significantly correlated with dietary restraint ($r = .44$, p = ns), the EAT-26 score ($r = -.35$, p = ns) or the frequency of binge episodes or self-induced vomiting.	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Geller et al. (1998)	Cross-sectional questionnaire	AN BN EDNOS	23 18 7	Psychiatric control group Non-clinical sample	44 82	RSE	N/A	Individuals with eating disorders had significantly lower self-esteem than the psychiatric control group, who had significantly lower self-esteem than the non-clinical control group, $F(2, 157) = 22.79$, $p < .001$).	Yes - BDI
Geller et al. (2000)	Cross-sectional questionnaire	AN	21	Psychiatric control group Non-eating disordered control group	21 21	RSE	N/A	Individuals with AN reported lower self-esteem than the psychiatric control group, who reported lower self-esteem than the non-eating disordered control group, $F(2,59) = 43.16$, $p < .001$).	No
Jacobi, Paul, de Zwaan, Nutzinger, & Dahme (2002)	Cross-sectional questionnaire	AN BN	33 38	Patients with anxiety disorders Patients with depressive disorders Non-eating disordered controls	37 37 143	FSCS	N/A	Patients with AN ($F(1,61) = 12.6$, $p < .001$, $r = .78$) and BN ($F(1,73) = 15.3$, $p < .001$, $r = .75$) had significantly lower self-esteem than matched control groups. Patients with AN and BN had significantly lower self-esteem than patients with anxiety disorders ($p < .05$). Patients with BN, but not AN, had significantly lower self-esteem than patients with depressive disorders ($p < .05$).	Yes - BDI

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Joiner, Schmidt, & Wonderlich (1997)	Cross-sectional questionnaire	BN	22	Healthy controls	24	BDI Self-Esteem Composite	EDI – Body Dissatisfaction subscale	Individuals with BN had lower self-esteem than healthy controls ($p < .001$, $r = .77$). A multiple regression revealed that body dissatisfaction x diagnostic status interaction was a significant predictor of self-esteem, $t(42) = 2.04$, $p < .05$. There was a stronger relationship between self-esteem and body dissatisfaction among patients with BN ($r = .58$, $p < .01$) than among controls ($r = .35$, p = ns).	No
Kelly, Vimalakanthan, & Carter (2014)	Cross-sectional questionnaire	BN RAN BPAN EDNOS	29 26 18 24	Non-clinical sample	155	RSE	EDE-Q	The eating disordered group had significantly lower self-esteem than the control group ($t = -14.59$, $p < .001$, $r = .72$). Multiple regressions revealed that self-esteem was a negative predictor of EDE-Q global ($\beta = -.40$, $p < .05$), eating concerns ($\beta = -.51$, $p < .01$), and shape concerns scores ($\beta = -.45$, $p < .05$), but not EDE-Q restraint ($\beta = -.33$, p = ns), or weight concerns scores ($\beta = -.31$, p = ns), in the eating disordered group. In the control group, self-esteem did not predict EDE-Q subscale or global scores (p = ns).	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Kiezebrink, Campbell, Mann, & Blundell (2009)	Cross-sectional questionnaire	RAN BPAN EAN	197 132 99	Non-eating disordered controls	119	RSE	N/A	Individuals with RAN, BPAN and EAN had significantly lower self-esteem than controls, $F(3, 543) = 371.65$, $p < .001$. Individuals with RAN and BPAN had significantly lower self-esteem than EAN patients ($p < .05$).	No
Leung & Price (2007)	Cross-sectional questionnaire	AN BN	16 17	Symptomatic dieters Normal dieters Non-eating disordered controls	16 39 34	RSE	N/A	Eating disordered patients had significantly lower self-esteem than symptomatic dieters, who had lower self-esteem than normal dieters ($F = 60.8$, $p < .001$). Self-esteem scores for normal dieters and non-eating disordered controls were not significantly different.	No
Paterson, Power, Collin, Greirson, Yellowlees, & Park (2011)	Cross-sectional questionnaire	RAN	55	Non-eating disordered controls	50	MSEI	EDE-Q	AN patients had significantly lower self-esteem than controls ($t = -10.71$, $p < .001$, $r = .71$). Self-esteem was significantly negatively correlated with all subscales on the EDE-Q namely the global ($r = -.54$, $p < .001$), restraint ($r = -.52$, $p < .001$), eating ($r = -.43$, $p < .001$), shape ($r = -.53$, $p < .001$), and weight ($r = -.47$, $p < .001$), subscale in the AN sample.	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Paterson, Power, Yellowlees, Park, & Taylor (2007)	Cross-sectional questionnaire	AN	27	Non-eating disordered controls	62	SLCS-R	EAT-26	The eating disordered group had significantly lower levels of self-liking (t = -6.09, p < .01, r = .59) and self-competence (t = -5.24, p < .01, r = .54) than the control group. In the AN sample, there was a significant negative correlation between eating pathology (EAT-26 score) and the self-competence component of self-esteem (r = -.50, p < .001), but not the self-liking component (r = -.29, p = ns).	
Rosen & Ramirez (1998)	Cross-sectional questionnaire	AN BN	11 34	Non-clinical sample	30	RSE	N/A	Eating disordered patients had significantly lower self-esteem than non-clinical controls (p < .001, r = .74). There was no significant difference on level of self-esteem between patients with AN and BN.	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Senra, Sanchez-Cao, Seoane, & Leung (2007)	Cross-sectional questionnaire	RAN BPAN BN purging type BN non-purging type	16 46 63 10	Non-eating disordered controls	124	RSE	EAT-40 EDI – Body dissatisfaction scale	Individuals with eating disorders had significantly lower self-esteem than controls (t = -11.22, p < .01, r = .61). There was no significant difference on level of self-esteem between patients with AN and BN. Self-esteem scores were significantly negatively correlated with eating pathology (EAT-40; r = -.55) and body dissatisfaction (r = -.55) in patients with eating disorders.	No
Silvera et al., 1998	Cross-sectional questionnaire	AN BN EDNOS	6 1 3	Non-eating disordered controls	41	SLCS	BMI EDS-5	A logistic regression analysis with clinical diagnosis as the criterion variable and BMI, MADRS, SL and SC as the predictor variables revealed a significant effect of SL, $\chi^2(1) = 7.51$, p < .001, such that low self-liking was associated with the presence of an eating disorder while self-competence, BMI and depression were not.	Yes - MADRS

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Surgenor, Maguire, Russell, & Touyz (2007)	Cross-sectional questionnaire	AN	77	N/A	N/A	RSE – Self Liking and Self Competence subscales	EDI-2	Self-liking was significantly lower in individuals with BPAN compared to RAN, $t(74) = 2.8$, $p < .01$, $r = .37$. Self-competence was not significantly associated with AN subtype. Severity of eating disturbance was associated with both self-liking ($r = -.47$, $p < .001$) and self-competence ($r = -.73$, $p < .001$). Lower self-liking was significantly associated with laxative abuse, $t(74) = 2.7$, $p < .01$ and self-induced vomiting, $t(74) = 2.2$, $p < .05$. To assess the relative contribution of each of these forms of purging to levels of self-liking a multiple regression was carried out and revealed that engaging in laxative abuse alone contributed to self-liking (adjusted $R^2 = .09$, $p = .05$).	No
Vanderlinden, et al. (2009)	Cross - sectional	RAN BPAN BN	10 5 10	Non-clinical sample	29	EAST (Implicit measure of self-esteem) RSE	No	There was no significant difference between the eating disordered group and control group on levels of implicit self-esteem (p = ns). The eating disordered group had significantly lower explicit self-esteem than the control group ($t = -7.46$, $p < .01$, $r = .70$).	No

Study	Design	Clinical sample	N	Control sample	N	Self-esteem measure(s)	Additional relevant outcome measure(s)	Outcome	Controlled for depression?
Wilkish & Wade (2003)	Cross-sectional questionnaire	AN	19	Restrained eaters Unrestrained eaters	20 21	SPPA	EDE-Q – shape and weight concern subscale	Individuals with AN had significantly lower self-esteem than restrained eaters, who had significantly lower self-esteem than unrestrained eaters (F= 51.19, p < .001, η^2= .72). After controlling for depression, only the latter result remained significant, $F(2,55) = 11.08$, $p < .05$.	Yes - CES-D
Williams et al. (1993)	Cross-sectional questionnaire	AN BN	32 30	Healthy controls Obese dieters Non-obese dieters	35 31 29	RSE	N/A	Individuals in the two eating disorder groups reported significantly lower self-esteem than the three comparison groups, $F(2,152) = 89.2$, $p <$ .001. Self-esteem scores in the AN and BN group were not significantly different.	Yes

Note. Data is included in the table where it is available from the study article. Missing data means the information is missing from the article. BDI = Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erlbaugh, 1961 [English Version]; BDI-II = Beck Depression Inventory Second Edition, (Beck, Steer, & Brown, 1996); BMI = Body Mass Index; BPAN = Anorexia Nervosa of the Binge-Purge Subtype; CES-D = The Centre for Epidemiological Studies Depression Scale (Radloff, 1977); EAN = Exercising Anorexia Nervosa Patients; EAST = Extrinsic Affective Simon Task (De Houwer, 2003); EAT-26 = Eating Attitudes Test 26 items (Garner, Olmsted, Bohr, & Garfinkel, 1982); EAT-40 = Eating Attitudes Test 40 items (Garner & Garfinkel, 1979); EDE-Q = Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994); EDI= Eating Disorders Inventory (Garner, Olmstead, & Polivy, 1983); EDI-2 = Eating Disorders Inventory Version Two (Garner, 1991); FSCS = Frankfurt Self-Concept Scales (Deusinger, 1986); MADRS = Montgomery-Asberg Depression Rating Scale (Montgomer & Asberg, 1979); MSEI = Multi-Dimensional Self-Esteem Inventory (O'Brien & Epstein, 1988); PHQ-9 = Patient Health Questionnaire (Gräfe, Zipfel, Herzog, & Löwe, 2004); RAN = Anorexia Nervosa of the Restricting Subtype; ns = not significant; Restraint Scale (Herman & Polivy, 1980); RSE = Rosenberg Self-Esteem Scale (Rosenberg, 1965); SE-IAT = Self-Esteem Implicit Association Test (Greenwald & Farnham, 2000); SLCS = Self-Liking/Competence Scale (Tafarodi & Swann, 1995); SLCS-R = Self-Liking/Competence Scale Revised (Tafarodi & Swann, 2001); SPPA = Self-Perception Profile for Adolescents (Harter, 1986); SSES = State Self-Esteem Scale (Heatherton & Polivy, 1991).

1.3.2 Aim 1: Do Adult Females with Eating Disorders have Low Global Self-Esteem?

Due to the variability of the conceptualisation of self-esteem in the eating disorders literature and to allow the results to be clearly synthesised, studies are presented according to how they have conceptualised self-esteem. The first section will consider results of studies that conceptualised self-esteem as an explicit uni-dimensional construct. Overall, 20 out of the 26 studies included in the review utilised measures of explicit self-esteem. The 18 studies that measured self-esteem using the RSE will firstly be considered.

Studies Measuring Self-Esteem as an Explicit Uni-Dimensional Construct - Rosenberg Self-Esteem Scale (Rosenberg, 1965).

A central tenet of the transdiagnostic model is that at least some individuals with eating disorders have 'core-low self-esteem', which plays a role in the maintenance of eating disorder pathology. Research included in this review has found that low global self-esteem measured as an explicit uni-dimensional construct is characteristic of adult females with eating disorders, supporting this proposal. Four studies (Geller et al., 1998; Kelly et al., 2014; Rosen & Ramirez, 1998; Vanderlinden et al., 2009) found that individuals with eating disorders reported lower self-esteem than non-clinical control groups. Vanderlinden et al. (2009) found that inpatients with AN of the restricting subtype (RAN), AN of the binge-purge subtype (BPAN*)* and BN had significantly lower self-esteem than non-clinical controls. Rosen and Ramirez (1998) found a similar pattern of results in outpatients with AN and BN, indicating that patients with eating disorders have lower self-esteem than non-clinical controls regardless of the severity of the disorder. Although

these studies were criticised for having small sample sizes, a larger study utilising outpatients replicated these results (Geller et al., 1998). A limitation of Geller et al.'s (1998) study was that a number of individuals in the eating disorder group were receiving treatment at the time of data collection. To address this shortcoming, Kelly et al. (2014) assessed levels of self-esteem in outpatients prior to the beginning of treatment. After comparing these results to levels of self-esteem in non-clinical controls the same result was found. A consistent weakness across these four studies is that the control groups were not assessed for the presence of an eating disorder or any other mental health difficulty. Therefore, the authors could not be sure that such participants represented a non-clinical sample, reducing the validity of the results.

To overcome this difficulty, seven studies (Bardone-Cone et al., 2010; Bers & Quinlan, 1992; Cockerham et al., 2009; Geller et al., 2000; Kiezebrink et al., 2009; Leung & Price, 2007; Senra et al., 2007), which utilised the RSE, assessed individuals in the control group for the presence of an eating disorder. Collectively, these studies corroborate the results of the previous section that individuals with eating disorders have lower self-esteem than comparable individuals without eating disorders. Bardone-Cone et al. (2010) found this result when combining data from patients with AN, BN and EDNOS and comparing this to non-eating disordered controls. Kiezebrink et al. (2009) also found this result when combining data assessing levels of self-esteem in patients with RAN, BPAN and patients with AN who exercised excessively[4]. In a similar study employing outpatients with RAN, BPAN, BN purging type and BN non-purging type, Senra and colleagues (2007) also

[4] Excessive exercising was defined as individuals who exercised for more than seven hours a week over five or more days. Individuals had to participate in no less than five hours of aerobic activity and this amount of exercise had to be present for more than three months.

confirmed this finding. However, in this study participants in the eating disorder group were significantly younger than those in the control group. As self-esteem has been found to rise throughout adulthood (Robins, Trzesniewski, Tracey, & Gosling, 2002), it is unclear whether the low self-esteem reported in this study is specific to eating disorder symptoms or better reflects the different ages of the participants in the two groups. To address this limitation, two studies (Bers & Quinlan, 1992; Geller et al. 2000) matched the age of participants in the eating disorder and control groups during the recruitment process. Using an inpatient AN sample, Bers and Quinlan (1992) found that individuals with AN had lower self-esteem than age matched non-eating disordered controls. Geller et al. (2000) also found this result after matching participants in the control group by age and years of education to the AN group. These findings indicate that female adults with eating disorders have lower self-esteem than non-eating disordered controls irrespective of the age of the participants in the sample.

To further our understanding of self-esteem in eating disordered patients, Geller et al. (2000) included a psychiatric control group consisting of individuals with a diagnosis of major depressive episode, bipolar disorder, and dysthymic disorder in their study. They found that people with AN reported lower self-esteem than the psychiatric control group, who reported lower self-esteem than the non-eating disordered control group. This suggests that individuals with AN can be differentiated to those with mood disorders, with patients with an eating disorder having lower self-esteem. However, given that the psychiatric control group were less symptomatic than the eating disorder group on measures of depression and global functioning, the differences in results may be due to group differences in global symptomology. Further studies would benefit from selecting samples matched

on psychological distress. Levels of expressed emotion is also believed to change over time as a function of treatment (Geller et al., 2000) however, this study failed to collect information on the duration of treatment patients had received. Therefore, this variable may have also confounded the results.

In addition to a non-eating disordered control group, Leung and Price (2007) also employed a group of female dieters. Dieters share many of the concerns relating to eating, weight and shape as individuals with eating disorders but do not meet the diagnostic criteria (APA, 2013). Therefore, if clinical populations have lower self-esteem than dieters this suggests 'core low self-esteem' may have a role in the aetiology of eating disorders. Leung and Price (2007) found that patients with eating disorders had significantly lower self-esteem than the symptomatic dieters[5], who had significantly lower self-esteem than normal dieters, who had significantly lower self-esteem than non-eating disordered controls. Considering the eating disordered and symptomatic dieter groups did not differ on the severity of some eating symptoms, these results support the assertion that levels of self-esteem are fundamentally different in women with and without an eating disorder. It also suggests that 'core low self-esteem' may contribute to the development of eating disorders, an area not currently commented on in the transdiagnostic model (Fairburn et al., 2003).

Although the evidence suggests that adult females with eating disorders have low self-esteem, with the exception of Geller et al. (1998), none of the studies described above controlled for the effect of comorbid disorders such as depression. Consequently, it is unclear whether the low levels of self-esteem found are specific to eating disorder symptomology or instead reflect the presence of symptoms of

[5] Dieters who showed some eating disordered behaviour that resembled AN or BN.

depression. To overcome this limitation, Cockerham et al. (2009) controlled for depression, when investigating levels of self-esteem in individuals with BN and controls. Even after controlling for the impact of depression, the results confirmed previous findings that females with BN have lower self-esteem than non-eating disordered controls.

A limitation of the studies described so far is that the control groups only controlled for the absence of an eating disorder. Given that the presence of a range of mental health problems (e.g., anxiety) are often associated with low self-esteem (Link et al., 2014), if participants in the control group were experiencing another diagnosable mental health difficulty this may affect the validity of results. To ensure high quality results, five studies (Blechert et al., 2011; Brockmeyer et al., 2012; Cockell et al., 2002; Cooper & Turner, 2000; William et al., 1993) compared levels of self-esteem in patients with eating disorders to a healthy control group, defined by the absence of an eating disorder and any other diagnosable mental health disorder. One of these studies (Brockmeyer et al., 2012) also controlled for the confounding influence of depression on self-esteem and found that AN patients reported lower self-esteem than healthy controls even after controlling for depression. This result suggests that individuals with eating disorders have low self-esteem irrespective of their levels of depression, supporting the proposal of the transdiagnostic model that self-esteem may be a useful target for treatment.

Similar to Leung and Price's (2007) findings, Williams et al. (1993) and Cooper and Turner (2000) found that individuals with eating disorders had significantly lower self-esteem than dieters and healthy controls, who did not differ on levels of self-esteem, suggesting that the absence of 'core low self-esteem' in dieters may help explain the absence of a clinical disorder.

Blechert et al. (2011) also found that individuals with eating disorders had lower self-esteem than healthy controls. Cockell et al. (2002) expanded on this study and compared self-esteem in patients with AN, healthy controls and a psychiatric control group consisting of individuals with major depressive disorder, bipolar disorder and dysthymic disorder. Their results were consistent with Geller et al. (2000); individuals with AN had significantly lower self-esteem than the psychiatric control group, who had significantly lower self-esteem than the healthy control group. This supports the assertion that individuals with AN can be differentiated to those with mood disorders, with patients with an eating disorder having lower self-esteem (Cockell et al., 2002).

Collectively, research utilising the RSE as a uni-dimensional measure of self-esteem, supports the assertion of the transdiagnostic model (Fairburn et al., 2003) that at least some individuals with eating disorders have 'core low self-esteem'.

Studies Employing Other Explicit Measures of Uni-Dimensional Self-Esteem

Despite the popularity of the RSE as a measure of global self-esteem, its validity and reliability have been questioned because it can be influenced by changes in mood (Andrews & Brown, 1993), suggesting that it may be a measure of state as opposed to trait self-esteem. To address this concern, four of the studies (Jacobi et al., 2002; Joiner et al., 1997; Paterson et al., 2011; Wilkish & Wade, 2003) included in this review utilised alternative measures of explicit, uni-dimensional self-esteem. The findings of these studies will now be discussed.

Jacobi et al. (2002) used the global self-esteem subscale of the Frankfurt Self-Concept Scales (FSCS; Deusinger, 1986) to measure levels of self-esteem in patients with eating disorders, psychiatric controls and non-eating disordered

individuals. The FSCS was chosen above the RSE because the RSE had not been validated for use in a German population at the time of the study. After controlling for the influence of depression, Jacobi et al.'s (2002) findings partially supported the results of previous studies (Cockell et al., 2002; Geller et al., 2000), that patients with eating disorders have lower self-esteem than psychiatric controls. Specifically, Jacobi et al. (2002) found that patients with AN and BN reported significantly lower self-esteem than non-eating disordered controls and patients with anxiety disorders. However, only individuals with BN, and not AN, had significantly lower self-esteem than patients with depressive disorders. This final result is in contrast to Cockell et al.'s (2002) and Geller et al.'s (2000) studies which found that patients with AN had lower self-esteem than a psychiatric control group which included individuals with major depressive disorder. These contrasting findings may be explained by the fact that Jacobi et al. (2002) used a different measure of self-esteem. However, given that Jacobi et al. (2002) controlled for the effect of depression and matched participants in the three groups on age and level of education, which the other two studies failed to do, it could be argued that their findings are more credible.

To further explore the role of self-esteem in the development of eating disorders, Wilkish and Wade (2003) used the Self-Perception Profile for Adolescents (Harter, 1986) to compare levels of self-esteem in adults with AN, restrained and

non-restrained eaters.[6] The authors do not specify why they chose this measure of self-esteem instead of the RSE. It may be because it is a more comprehensive measure that includes 45 items and assesses specific as well as global self-esteem. However, the measure is designed for use with young people aged 14-19 years (Harter, 1986). It has not been validated for use with adults, meaning the results of this study need to be interpreted with caution. Initially the study found that individuals with AN had significantly lower self-esteem than restrained eaters, who had significantly lower self-esteem than unrestrained eaters. However, after controlling for the effect of depression only the latter result remained significant. This result is in contrast to Leung and Price's (2007) and Cooper and Turner's (2000) studies which found that patients with eating disorders had lower self-esteem than dieters. Given that restrained eaters often display many features of an eating disorder (Fairburn, 2005) and Wilkish and Wade (2003) failed to assess this group for the presence of AN, BN or EDNOS, it is possible that their failure to find significance may be explained by individuals in both groups having diagnosable eating disorders.

Joiner et al. (1997) used three of the items (item 3, 7, and 8) on the BDI (Beck & Steer, 1987) to assess self-esteem. The results of this study are consistent with research that measured self-esteem using the RSE, that individuals with BN have lower self-esteem than healthy controls. Although research suggests that the

[6] Participants were selected for inclusion in the restrained/unrestrained eater groups based on their responses on the Restraint scale of the Dutch Eating Behaviours Questionnaire (DEBQ-R; Van Strien, Frijters, Bergers, & Defares, 1986). If participants were in the highest or lowest 25th percentiles of the 161 participants that initially completed the measure, they were assigned to the restrained/unrestrained eater group respectively.

self-esteem composite of the BDI is a valid measure of self-esteem (Joiner et al., 1997), the authors recognise that it is not an ideal measure and recommend future studies address this shortcoming.

To overcome this limitation Paterson et al. (2011) measured self-esteem using the well-validated Multi-Dimensional Self-Esteem Inventory (MSEI; O'Brien & Epstein, 1988). Their results are also consistent with previous studies in this review indicating that inpatients with RAN have significantly lower self-esteem than non-eating disordered controls.

So far, the studies discussed have all assessed self-esteem as a uni-dimensional construct. However, as detailed above, there is ongoing debate as to whether self-esteem is best measured in one or two dimensions (Robin et al., 2001; Tafarodi & Swann, 2001). The following section will review studies that measure self-esteem as a two-dimensional construct.

Studies Measuring Explicit Self-Esteem as a Two-Dimensional Construct

Three studies (Paterson et al., 2007; Silvera et al., 1998; Surgenor et al., 2007) included in this review assessed self-esteem as a two-dimensional construct. Two of these studies (Paterson et al., 2007; Silvera et al., 1998) employed an eating disorder sample and a control group and will now be discussed. As Surgenor et al. (2007) did not include a non-clinical comparison group their findings will be discussed in the next section of the review, which will consider self-esteem in specific eating disorder subgroups.

Silvera and colleagues (1998) were the first to investigate the dual factor interpretation of self-esteem using the SLCS. Silvera et al. (1998) found that low SL was associated with the presence of an eating disorder, whilst SC was not. If these

findings are replicated in future research they may have important clinical implications e.g., tailoring clinical interventions to specifically focus on improving levels of SL as opposed to SC. However, the small sample size is a limitation of this study and may explain the lack of association between SC and eating disorders (Silvera et al., 1998).

To address this limitation, Paterson et al. (2007) recruited a larger sample of patients with AN. Using the SLCS-R, they found that individuals with AN have significantly lower levels of SL and SC than non-eating disordered controls. These results differ from Silvera and colleagues (1998) findings. This may be because Paterson et al.'s (2007) study only utilised AN patients, indicating that there may be a difference between SL and SC in patients with AN, BN and EDNOS. In contrast to Silvera et al. (1998) who recruited outpatients, Paterson et al. (2007) used an inpatient sample. A potential explanation for the contrasting findings may therefore be that patients with more severe eating disorders have lower levels of SL and SC. Further research investigating these possibilities would extend the literature.

The research reviewed so far has focused on trait self-esteem. However, recent conceptualisations of the self (e.g., Conway & Pleydell-Pearce, 2000) have emphasised the importance of considering short-term fluctuations in self-esteem. Specifically, Conway and Pleydell-Pearce (2000) suggest that over time improvements in state self-esteem may lead to an increase in trait self-esteem. Given this hypothesis, the transdiagnostic model would benefit from considering the possible impact fluctuations in state self-esteem may have on 'core low self-esteem'. In line with this hypothesis, studies which have investigated overall attitudes towards the self using a measure of state self-esteem will now be reviewed.

State Self-Esteem

Two studies (Corte & Stein, 2005; Daley et al., 2008) in this review assessed state self-esteem. Daley and colleagues' (2008) study included a healthy control group and will be discussed now. However, Corte and Stein's (2005) study only assessed levels of state self-esteem in females with eating disorders. The results of their study will therefore be discussed in the next section of the review.

Daley et al. (2008) used the total score on the SSES (Heatherton & Polivy, 1991) to assess overall levels of state self-esteem. Similar to the studies which assessed trait self-esteem, this study found that individuals with BN without comorbid depression had lower self-esteem than healthy controls. Given that improvements in state self-esteem may, over time, lead to improvements in 'core low self-esteem', future research would benefit from testing this hypothesis. This could be done by administering the SSES before and after individuals with eating disorders have attended a treatment intervention specifically designed to improve self-esteem. The SSES and RSE could also be administered at follow up to assess whether the treatment is effective over time and if so, if it has any impact on trait self-esteem.

Collectively, the research in this area so far demonstrates that individuals with eating disorders have lower levels of explicit self-esteem than non-clinical controls. Given that feelings towards the self are represented at both the conscious, accessible level and unconscious, intuitive level (Greenwald & Farnham, 2000), this review will now discuss studies which have investigated implicit self-esteem in individuals with eating disorders.

Implicit self-esteem

To build upon the findings of the previous section, three studies (Cardi et al., 2014; Cockerham et al., 2009; Vanderlinden et al., 2009) assessed implicit self-esteem in adult females with eating disorders. However, in comparison to the previous section there is a less consistent pattern of findings.

Two studies (Cardi et al., 2014; Cockerham et al., 2009) used the SE-IAT to measure implicit self-esteem. [7] After controlling for depression, Cockerham et al. (2009) found that individuals with BN had significantly higher implicit self-esteem than non-eating disordered controls. This result is in contrast to studies assessing explicit self-esteem. However, a positive self-esteem bias is common in the non-clinical population (Greenwald et al., 2002) and has also been found in individuals with depression (De Raedt, Schacht, Franck, & Dr Houwer, 2006). This study was the first to investigate implicit self-esteem in an eating disordered population; however, it had a relatively small sample size and the results were constrained to individuals with BN.

In a larger study, Cardi et al. (2014) found that individuals with eating disorders had significantly lower implicit self-esteem than healthy controls. This result directly conflicts with Cockerham and colleagues' (2009) findings. Given that depression can have a negative effect on self-esteem (Butler, Hokanson, & Flynn, 1994), the difference in the results may be explained by the fact that Cardi et al. (2014) failed to control for the influence of depression. The contrasting findings may also be explained by the diagnoses of participants in the sample. Cardi et al. (2014) combined patients with RAN, BPAN and BN into one eating disorder group to

[7] Readers are directed to the original papers for further details regarding the SE-IAT.

measure implicit self-esteem whilst Cockerham et al. (2009) only employed individuals with BN. It is therefore possible that individuals with different eating disorders have different levels of implicit self-esteem. Future research using the SE-IAT and samples of patients with AN, RAN, BPAN, BN and EDNOS that are large enough to allow for independent group analysis would be beneficial to improve our understanding of levels of implicit self-esteem in individuals with eating disorders. Although the SE-IAT is the most widely used measure of implicit self-esteem (Cardi et al., 2014), its validity in measuring automatic evaluations has been criticised. Specifically, Rothermund and Wentura (2004) argue that the IAT may measure salience of concepts rather than associations. Where IAT proponents claim that faster response times when pairing concepts indicate stronger associations (e.g., Greenwald & Farnham, 2000), critics claim that faster response times indicate that concepts are similar in salience (and slower response times indicate that concepts differ in salience; Rothermund & Wentura, 2004).

To overcome this possible limitation of the IAT, De Houwer (2003) created the Extrinsic Affective Simon Task (EAST), a modified version of the IAT. Throughout this task, participants are required to respond to the relevant characteristics of a stimulus whilst ignoring an irrelevant feature. As a result of task instructions the responses are extrinsically related to the valence dimension (e.g., 'pleasant' versus 'unpleasant').[8] Although this instrument has been successfully used as a measure of self-esteem with university students (De Houwer, 2003), Vanderlinden and colleagues (2009) were the first to use the EAST with an eating disordered population. In comparison to Cockerham et al. (2009) and Cardi et al.

[8] Readers are directed to Vanderlinden et al.'s study for further details regarding the EAST.

(2014), Vanderlinden et al. (2009) found that although there is a trend towards individuals with eating disorders having lower implicit self-esteem than non-clinical controls there were no significant differences between the two groups. This study included a relatively small sample, therefore it is possible that this result may have become significant if a larger sample was employed. A further limitation of the study was that the control group consisted of female university students who often have increased levels of disordered eating compared to the general population (Sepulveda, et al., 1980), reducing the validity of the findings. As this was the first study to use the EAST in an eating disordered population, refinement of the measure in future studies is recommended (Vanderlinden et al., 2009). Despite these limitations, the use of the EAST in an eating disordered population is an exciting development in the literature and further research using this measure is urgently needed to expand upon this finding.

Overall, the literature in this area is still in its infancy and inconsistent results limit what conclusions can be drawn regarding implicit self-esteem in adults with eating disorders. Given the limitations that exist in the measures of implicit self-esteem (e.g., Rothermund & Wentura, 2004; Vanderlinden et al., 2009), research is needed to assess the validity of these measures in eating disordered populations. Research can then continue to assess levels of implicit self-esteem in this client group with the aim of developing our understanding and informing clinical practice.

The research reviewed so far suggests that female adults with eating disorders may have lower levels of global self-esteem than individuals with other psychiatric disorders. However, the findings reviewed above do not tell us whether levels of self-esteem differ between individuals with AN, BN and atypical eating

disorders. Studies investigating self-esteem in different eating disorder subgroups will now be discussed.

1.3.3 Aim 2: Self-Esteem in Specific Eating Disorder Subgroups

In the previous section we have seen that 'core low self-esteem' is characteristic of women with eating disorders when it is measured as an explicit uni-dimensional construct. To build on these findings, seven studies investigated whether levels of self-esteem differ between individuals with AN, BN and atypical eating disorders. Once again, the findings are consistent when self-esteem is measured as an explicit uni-dimensional construct but vary when a two-dimensional measure of self-esteem is introduced.

Five studies (Bletchert et al., 2011; Jacobi et al., 2002; Rosen & Ramirez, 1998; Senra et al., 2007; Williams et al., 1993) utilising a uni-dimensional measure of explicit self-esteem found that there was no significant difference between levels of self-esteem in patients with AN and BN. In contrast to these studies, Corte and Stein (2005) adapted the RSE to measure levels of state self-esteem in patients with AN, BN, sub-threshold AN[9] and sub-threshold BN[10]. Consistent with the findings of previous studies, they found that average state self-esteem scores were not

[9] Participants were classified as sub-threshold AN when they met the attitudinal criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders-III-R [DSM-III-R; APA, 1987] and one of the biological criteria e.g., 85% of ideal body weight or amenorrhea

[10] Participants were classified as sub-threshold BN when their bingeing/compensatory behaviour cycles did not meet the intensity or duration criteria outlined in the DSM-III-R (APA, 1987), or when they engaged in purging behaviour after eating small to normal quantities of food.

significantly different between the four groups. The transdiagnostic model (Fairburn et al., 2003) claims that it can be applied to patients with AN, BN and EDNOS. The studies discussed above support this proposal as they show that patients in each of the eating disorder subgroups can have 'core low self-esteem'.

Two further studies investigated levels of self-esteem in different AN subgroups. Kiezebrink et al. (2009) found no significant difference in levels of self-esteem between females with RAN and BPAN. However, this study did find that individuals with EAN had significantly higher self-esteem than RAN and BPAN patients. This result suggests that patients with AN who do not engage in excessive exercise may have lower levels of 'core low self-esteem', and may benefit from treatment specifically designed to improve self-esteem.

Surgenor and colleagues (2007) also investigated levels of self-esteem in patients with RAN and BPAN but instead of scoring the RSE as a uni-dimensional measure of self-esteem, they summed the relevant items to generate scores for SL and SC (Tafarodi and Swann, 1995). Surgenor et al. (2007) found that SL was significantly lower in individuals with BPAN compared to RAN. However, there was no significant difference in levels of SC between these two groups. As the measures of SL and SC were constructed from the RSE, which was designed to measure uni-dimensional self-esteem, it is likely that these measures are relatively unrefined (Surgenor et al., 2007). Future studies would benefit from utilising a questionnaire specifically designed to measure two-dimensional self-esteem e.g., the SLCS-R (Tafarodi and Swann, 2001). As this is the only study comparing levels of SL and SC in specific eating disorder subgroups, the results need to be replicated with further AN patients as well as individuals with BN and EDNOS before firm conclusions can be drawn. Fairburn et al. (2003) hypothesises that global self-esteem

is a critical factor obstructing recovery in some individuals with eating disorders. Thus, if future research indicates that different eating disorder subgroups are characterised by different levels of SL and SC this would help inform which construct of self-esteem to target in treatment. Individuals with low SC may view themselves as incapable of effecting change, whilst individuals with low SL may view themselves as unworthy of change (Tafarodi & Swann, 2001). These are quite different psychological obstacles, which would likely benefit from different clinical interventions; therefore, future research investigating levels of SL and SC in different eating disorder subgroups would be extremely useful to help inform clinicians as to which treatment approach may be most effective.

In sum, research in this area suggests that individuals with RAN, BPAN, AN and BN have similar levels of self-esteem when a uni-dimensional measure of explicit self-esteem is used. However, when a two-dimensional measure of self-esteem is employed significant differences are reported in levels of SL, but not SC, between different AN subgroups (Surgenor et al., 2007). To date, no studies have compared levels of implicit self-esteem in different eating disorder subgroups. Future research would benefit from investigating this to allow us to better conceptualise self-esteem in eating disordered populations.

Despite studies investigating different conceptualisations of self-esteem providing different results in this client group, the transdiagnostic model argues that individuals with AN, BN and EDNOS share many common symptoms (Fairburn et al., 2003). Therefore, from a clinical perspective it may be more meaningful to investigate the relationship between self-esteem and specific eating disorder symptomology rather than by diagnosis. Studies exploring this relationship will now be discussed.

1.3.4 Aim 3: Relationship between Self-Esteem and Specific Eating Disorder Symptomology

Although Fairburn et al.'s (2003) transdiagnostic model does not make specific predictions about the relationship between global self-esteem and eating disorder symptomology; this has been investigated in the current review to try to help clinicians identify patients that may have 'core low self-esteem' early on in treatment. Clinical interventions could then focus on improving 'core low self-esteem' at the start of treatment, which would prevent it obstructing change and hopefully result in improved clinical outcomes. However, research investigating whether self-esteem is linked to particular eating disorder behaviours has yielded inconsistent results.

Kelly et al. (2014) found that self-esteem was a negative predictor of the EDE-Q (Fairburn & Beglin, 1994) Global subscale as well as the Eating Concerns and Shape Concerns subscales in the eating disorder group but not the control group. This suggests that lower self-esteem is associated with greater eating disordered psychopathology in individuals with eating disorders. The results of Senra and colleagues' (2007) study are consistent with this finding. Senra et al. (2007) found that self-esteem was negatively correlated with body dissatisfaction (measured using the body dissatisfaction subscale of the EDI; Garner, Olmstead, & Polivy, 1983) and attitudes and behaviours associated with AN and BN (measured via the EAT-40; Garner & Garfinkel, 1979). This indicates that eating disordered individuals with low self-esteem have higher levels of body dissatisfaction and a greater number of eating disordered attitudes and behaviours. In accordance with these findings, Joiner et al. (1997) found a stronger negative relationship between body dissatisfaction and self-esteem in individuals with BN compared to healthy controls.

In contrast to Senra et al.'s (2007) findings, Daley and colleagues (2008) found that total state self-esteem in individuals with BN was not significantly correlated with the number of eating disordered attitudes and behaviours (measured via the EAT-26, Garner et al., 1982), dietary restraint or the frequency of binge-eating episodes or self-induced vomiting. The contrasting findings may be explained by the different self-esteem measures employed in the two studies. Daley et al. (2008) utilised a measure of state self-esteem whilst Senra et al. (2007) used a measure of trait self-esteem (Senra et al., 2007). As trait self-esteem is related to an individual's pervasive views of the self it makes sense that this is likely to have a greater influence on eating disorder symptomology than state self-esteem which fluctuates over time and is dependent upon current circumstances.

In comparison to BN symptomology, more research has been conducted into the relationship between self-esteem and symptoms of AN. Similar to the results of Senra and colleagues (2007) study, Paterson et al. (2011) found that a uni-dimensional measure of self-esteem was significantly negatively correlated with all subscales on the EDE-Q (Fairburn & Beglin, 1994) in a sample of patients with AN. Also using a sample of patients with AN, Brockmeyer et al. (2012) found that body weight and self-esteem were significantly negatively correlated.

Two studies also investigated the relationship between two-dimensional self-esteem and eating disorder symptomology. Using the RSE, but scoring it as a two-dimensional measure, Surgenor and colleagues (2007) found that SL and SC were significantly negatively correlated with the severity of the eating disorder disturbance (measured via the EDI total score; Garner et al., 1983) in patients with AN. Surgenor et al. (2007) also found that lower SL was significantly associated with engagement in self-induced vomiting and laxative abuse. To assess the relative

contribution of each form of purging to levels of SL, a multiple regression revealed that laxative abuse alone contributed to lower SL (Surgenor et al., 2007). Clinicians working with patients who abuse laxatives may therefore benefit from assessing their levels of global self-esteem during the assessment and considering whether it would be beneficial for treatment to focus on improving levels of SL early on in therapy to reduce the impact it may have at a later date.

In contrast to Surgenor and colleagues (2007) results, Paterson et al. (2007) found a significant negative correlation between eating disorder pathology (measured via the EAT-26; Garner et al., 1982), and the SC component, but not the SL component of self-esteem. This finding suggests that elements of self-esteem related to confidence and self-efficacy (SC) play a more important role in eating disorder pathology than an individual's sense of self-worth and social conformity (SL; Paterson et al., 2007).

In sum, the literature in this area suggests that more severe eating disorder psychopathology, greater body dissatisfaction and engagement in laxative abuse and self-induced vomiting may be associated with lower levels of self-esteem; however, these findings are inconsistent. It may therefore be beneficial for clinicians working with individuals who present with these difficulties to assess their levels of global self-esteem and then decide whether it would be useful to target 'core low self-esteem' early on in treatment. These findings also highlight the need for future models to consider the role of uni-dimensional and two-dimensional self-esteem in the maintenance of eating disorder symptomology.

1.4 Discussion

1.4.1 Discussion of Findings

The transdiagnostic model (Fairburn et al., 2003) proposes that, for some individuals with AN, BN and EDNOS, 'core low self-esteem' is a key maintaining factor in eating disorder psychopathology. Consistent with this prediction, the studies reviewed in this paper show that when self-esteem is assessed as an explicit uni-dimensional construct, individuals with eating disorders have lower global self-esteem than healthy controls. This finding was consistent across a range of self-report questionnaires (e.g., RSE, MSEI and FSCS), increasing its credibility. This result was also found to be significant independent of levels of depression, which is often associated with low self-esteem (Butler et al., 1994), increasing the validity of the finding. Although the transdiagnostic model does not comment on whether levels of 'core low self-esteem' vary between different eating disorder subgroups, the studies included in this review indicate that there are no significant differences between levels of global self-esteem in individuals with AN, RAN, BPAN and BN when self-esteem is measured as an explicit uni-dimensional measure. This finding provides further support for the transdiagnostic view of eating disorders (Fairburn et al., 2003).

As mentioned earlier, the description of 'core low self-esteem' provided in the transdiagnostic model (Fairburn et al., 2003) is simplistic and suggests limited understanding of the conceptualisation of self-esteem in eating disorders. Fairburn et al.'s (2003) definition of the construct appears to only refer to explicit, uni-dimensional self-esteem. However, when self-esteem is conceptualised differently the evidence suggesting that, 'core low self-esteem' is characteristic of individuals with eating disorders becomes mixed. Firstly, the results of studies included in this

review which conceptualise self-esteem as a two dimensional construct are inconsistent, with one study suggesting that low SL, but not SC, is characteristic of individuals with eating disorders (Silvera et al., 1998) and another suggesting that individuals with AN have significantly lower SL and SC than comparable individuals without eating disorders (Paterson et al., 2007). Secondly, despite the majority of studies focusing on explicit self-esteem, we also know that feelings towards the self are represented at the unconscious, intuitive level (Greenwald & Farnham, 2000), highlighting the need for us to consider levels of implicit self-esteem in individuals with eating disorders. This review demonstrates that research investigating implicit self-esteem in eating disorders is still in its infancy and the current research findings (e.g., Cardi et al., 2014; Cockerham et al., 2009; Vanderlinden et al., 2009) are inconsistent. However, the two studies that included implicit and explicit measures of self-esteem (Cockerham et al., 2009; Vanderlinden et al., 2009) confirmed the results of previous research suggesting that explicit and implicit self-esteem are two distinct constructs (Bosson et al., 2000).

Overall, the findings of this review broaden our understanding of the conceptualisation of self-esteem in eating disorders. The review highlights that uni-dimensional, two-dimensional, implicit and explicit self-esteem are all important constructs to consider and these findings can be used to expand the simplistic definition of ‘core low self-esteem’ provided in the transdiagnostic model (Fairburn et al., 2003).

As well as improving our understanding of the conceptualisation of self-esteem in eating disorders, this review also highlights the areas of self-esteem yet to be explored in this clinical population. Fragile and secure self-esteem are often referred to in the social psychology literature (e.g., Zeigler-Hill, 2013) however,

these concepts are only considered in one paper (Cockerham et al., 2009) in the current review. Kernis et al. (2005) argues that differences between implicit and explicit self-esteem is one way to distinguish between fragile and secure self-esteem. Within the social psychology literature, high fragile self-esteem is conceptualised as attitudes towards the self that are unrealistic, vulnerable to threat and require constant validation, whilst high secure self-esteem is conceptualised as positive attitudes towards the self that are realistic and not easily challenged (Kernis, 2003). Furthermore, within the context of fragile self-esteem, Zeigler-Hill (2006) distinguished between discrepant high self-esteem and discrepant low self-esteem. He argues that people with discrepant low self-esteem have low explicit and high implicit self-esteem, and people with discrepant high self-esteem have low implicit and high explicit self-esteem (Zeigler-Hill, 2006). Based on this definition, Cockerham et al. (2009) suggests that individuals with BN have discrepant low self-esteem. However, this was the only study that allowed the author to determine this finding. Future research in this area is therefore urgently needed.

When developing future models and expanding on current theories, researchers would benefit from considering the results of this review to help them conceptualise self-esteem in an eating disordered population. This would enable clinicians to develop a better understanding of how self-esteem may be contributing to the maintenance of the eating disorders and inform the development of clinical interventions.

1.4.2 Critical Review

Methodological Quality of the Review

There are a number of review level limitations which should be considered when assessing the contribution of findings. Firstly, the review only included published studies. Dickersin (1990) highlights the impact of publication bias where studies may not be published if the expected strength or direction of effect is not obtained. Therefore, it is possible that the current review may not include important unpublished findings. Secondly, only studies written in English were included in this review, adding an element of cultural bias to the reported findings. However, a key strength of the review was the broad search terms used, increasing the likelihood of all relevant studies being included.

Methodological Quality of Included Studies

The studies in the review were all carried out in clinical settings, increasing ecological validity and generalisability of findings. The study also included results from individuals in outpatient and inpatient settings, allowing the relationship between level of self-esteem and severity of the eating disorder to be explored.

A limitation true to all research on self-esteem in eating disorders is that it predominantly relies on cross-sectional and correlational designs, preventing conclusions regarding causality being made. A number of studies also explained that they excluded participants who were “too unwell” to participate (e.g., Kelly et al., 2014). The excluded participants may have had significantly low weight or have been engaging in a high number of compensatory behaviours. Given that research suggests that self-esteem is negatively correlated with the severity of the eating disorder (Surgenor et al., 2007), the inclusion of such participants in studies may

further our current understanding of the relationship between low self-esteem and specific eating disorder symptomology. The majority of studies included in the review also failed to control for the impact of the length of treatment received and the duration of the eating disorder. Both of these factors have been found to influence levels of self-esteem (e.g., Geller et al., 2000), and thus may have influenced the results.

The high reliance on self-report questionnaires is another weakness of the studies included in this review. In addition to the possibility of respondent bias, global self-esteem is based on conscious, accessible beliefs about the self as well as unconscious, intuitive attitudes towards the self (Greenwald & Farnham, 2000), it is therefore questionable as to whether short questionnaires such as the RSE can truly assess levels of global self-esteem. Future research which uses a mixture of methodologies may provide us with richer information regarding the conceptualisation of self-esteem in this client group.

1.4.3 Clinical Implications

In sum, this review suggests that individuals with eating disorders have low uni-dimensional explicit self-esteem and that SL and SC as well as implicit self-esteem are likely to play a role in the maintenance of eating disorders for at least some individuals. These findings may help to explain why traditional Cognitive Behaviour Therapy (CBT) protocols, which predominantly focused on disorder specific cognitions (e.g., over-evaluation of eating, shape and weight) and behaviours (e.g., engagement in compensatory behaviours), may not be effective with all individuals with eating disorders. Given that the evidence suggests that at least some individuals with eating disorders have ‘core low self-esteem’, it is

important to consider how treatment protocols can be improved to enhance self-esteem when conventional approaches are not effective.

Fairburn (2008) has incorporated a 'core low self-esteem' module within his CBT for Eating Disorders (CBT-E) treatment to augment therapy. Within this module clinicians initially provide personalised education to individuals about the processes that maintain their low self-esteem. Treatment then focuses on recognising, testing out and altering cognitive processes that may be maintaining low self-esteem (e.g., discounting positive qualities, selective attention towards negative aspects of the self), predominantly through verbal techniques. Finally, this approach is combined with efforts to support clients to behaviourally engage in new and rewarding parts of life. Fairburn (2008) explains that the contents of this module are predominantly based on Fennell's (2006) treatment approach to overcoming low self-esteem in the general population. A limitation of adopting generalised treatment interventions is that the treatment is not specifically tailored to address low self-esteem in an eating disordered population, meaning that key factors that may maintain low self-esteem in this client group may not be addressed in therapy.

Future clinical interventions would benefit from considering uni-dimensional, two dimensional, implicit and explicit self-esteem when planning treatment for patients with eating disorders. Specifically, clinicians may benefit from measuring an individual's levels of SL and SC using the SLCS-R (Tafarodi & Swann, 2001) during the assessment, and then tailoring treatment to the area(s) that the client feels most affected by. If this is low SL, interventions may benefit from focusing on improving the individual's negative affect, self-derogation and social functioning (Tafarodi & Swann, 2001). Alternatively, if the person has low SC, interventions may benefit from focusing on helping the client to notice when they

achieve positive goals and giving themselves credit for this (Tafarodi & Swann, 2001).

In addition to verbal techniques, imagery-based interventions may also provide a way to improve 'core low self-esteem'. Although self-imagery techniques are not currently recognised in cognitive-behavioural treatments for eating disorders (e.g., Fairburn, 2008), self-imagery is considered a window to the self and research suggests that accessing a positive self-image can improve levels of self-esteem (Hulme, Hirsch & Stopa, 2012; Stopa, Brown, & Hirsch, 2011). A study by Farrar, Stopa and Turner (2015) provided provisional support for the use of self-imagery in eating disorders. Farrar et al. (2015) found that when individuals with high body dissatisfaction, characteristic of people with eating disorders, held a positive self-image of their body in mind there was an improvement in their explicit self-esteem. This approach may therefore be a useful addition to CBT-E, especially in cases where 'core low self-esteem' is preventing recovery.

1.4.4 Directions for Future Research

Future research should continue investigating explicit and implicit self-esteem in people with eating disorders using a range of validated measures. This will improve our understanding of implicit, fragile and stable self-esteem and expand the conceptualisation of self-esteem in eating disorders.

It would also be interesting to find out whether levels of implicit self-esteem in people with eating disorders are stable or fluctuating and if implicit self-esteem is associated with any eating disorder symptomology. This would improve our understanding of the role of implicit self-esteem in the maintenance of eating disorders.

Further research investigating the role of two-dimensional self-esteem in the maintenance of eating disorders is also urgently needed. This information will enable us to develop effective clinical interventions to improve specific aspects of global self-esteem e.g., SL and SC, with the ultimate aim being to support patients to make a full recovery.

Future research would also benefit from planning theoretically sound clinical interventions to target 'core low self-esteem' in patients with eating disorders. The effectiveness of these interventions could then be examined, with a particular focus on any changes in explicit and implicit, and uni and multi-dimensional self-esteem.

Given that retrieving positive self-images of the body can improve self-esteem in people with high body dissatisfaction (Farrar et al., 2015), future research would benefit from investigating whether other forms of self-imagery improve self-esteem in people with eating disorders.

Finally, we know that self-esteem varies with age (Robins et al., 2002) and the presentation of eating disorder symptomology can be different in males and females (Andersen, 1999); therefore, it would be beneficial for future systematic reviews to explore the conceptualisation of self-esteem in adolescent males and females, and adult males, with eating disorders.

1.5 Conclusion

The transdiagnostic model of eating disorders (Fairburn et al., 2003) suggests that a subset of individuals with eating disorders have 'core low self-esteem'. The model proposes that these global negative views of the self prevent individuals from fully engaging in treatment and maintain eating disorders. Given the proposed role of 'core low self-esteem' in the maintenance of eating disorder pathology this paper

aimed to systematically review the literature to establish whether adult females with eating disorders have 'core low self-esteem'. This paper also aimed to critically review the literature to assess how 'core low self-esteem' is conceptualised in this population. The results suggest that 'core low self-esteem' is characteristic of females with eating disorders when it is conceptualised as an explicit uni-dimensional construct. Only three studies to date have investigated two-dimensional self-esteem in the population. The results suggest that individuals with eating disorders have lower SL than comparable individuals without eating disorders (e.g., Paterson et al., 2007). However, the results of studies investigating levels of SC in females with eating disorders are inconsistent (e.g., Silvera et al., 1998; Surgenor et al., 2007). Research investigating implicit self-esteem in eating disorders is still in its infancy and no firm conclusions can be drawn. 'Core low self-esteem' has also been found to be associated with specific eating disorder symptomology e.g., laxative abuse (Surgenor et al., 2007). Clinically, this review has highlighted the importance of developing interventions to target 'core low self-esteem' in this client group. This could be facilitated through verbal or imagery-based techniques. Future research would benefit from investigating the effectiveness of these techniques in improving 'core low self-esteem' in this clinical population.

CHAPTER 2: EMPIRICAL PAPER

The Impact of Self-Imagery on the Self-Concept in Eating Disorders

2.1 Introduction

Eating disorders are often associated with a negative sense of self that is reflected in negative self-beliefs and low levels of self-esteem (Cooper & Turner, 2000; Fairburn, Cooper, & Shafran, 2003). The Diagnostic and Statistical Manual of Mental Disorders 5 (DSM-5; American Psychiatric Association [APA] 2013) distinguishes between different types of eating disorders including Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Other Specified Feeding and Eating Disorders (OSFED), referred to as Eating Disorders Not Otherwise Specified (EDNOS) in the previous versions of the DSM (APA, 1994; 2000). However, the transdiagnostic perspective of eating disorders (Fairburn et al., 2003) suggests that patients with these diagnoses share the same core psychopathology (e.g., over-evaluation of body shape and weight) and can migrate between diagnoses over time. Fairburn et al. (2003) therefore conclude that it is possible to view eating disorders as a single diagnostic category.

Early cognitive models of eating disorders (e.g., Fairburn, Cooper, & Cooper, 1986; Garner & Bemis, 1982) focused on how patients think about eating, body shape and weight to understand and treat eating disorder psychopathology. However, given the modest success of treatment protocols associated with these models (e.g., Fairburn et al., 1995), the transdiagnostic model (Fairburn et al., 2003) proposed that 'core low self-esteem', described as unconditional and pervasive negative views of

the self, may, at least for some individuals, be a key mechanism involved in the maintenance of eating disorders.

Fairburn et al. (2003) propose that 'core low self-esteem' maintains eating disorders in two key ways. Firstly, it creates hopelessness in patients about their capacity to change. This results in patients failing to fully engage in therapy, which subsequently reduces the likelihood of change occurring. Secondly, they propose that the intensity of patients 'core low self-esteem' results in them striving, with particular determination, to achieve their goals in their most valued domain, namely control over their eating, weight and shape. This makes it extremely difficult for patients to make any positive changes in these areas and consequently maintains the eating disorder. Furthermore, the pronounced negative processing biases and overgeneralisations made by individuals with 'core low self-esteem' results in any perceived failures, no matter how minor, being appraised as confirmation that they are failures as people, reaffirming their overall negative sense of self and maintaining eating disorder psychopathology (Fairburn et al., 2003).

Although it is useful that Fairburn et al. (2003) acknowledge the role of 'core low self-esteem' in the maintenance of eating disorders, their conceptualisation of self-esteem is very simplistic and suggests limited understanding of the self-concept in this population. Firstly, their definition of 'core low self-esteem' only refers to low levels of explicit self-esteem (conscious and accessible beliefs about the self), which is a widely documented characteristic of individuals with eating disorders (e.g., Bardone-Cone et al., 2010; Kelly et al., 2014; Paterson et al., 2011). Despite social psychology models (e.g., Greenwald & Farnham, 2000) stressing that explicit and implicit (unconscious, automatic attitudes towards the self) self-esteem, two distinct, albeit related constructs, contribute to an individual's view of their own self-

worth, Fairburn et al. (2003) fail to acknowledge the presence or role of implicit self-esteem in their account of 'core low self-esteem' as a maintaining mechanism for eating disorder pathology.

Although not commented on in the transdiagnostic model (Fairburn et al., 2003), three studies to date have investigated implicit self-esteem in an eating disordered population. However, the results are inconsistent. Initially, Cockerham, Stopa, Bell and Gregg (2009) reported that individuals with BN had a positive implicit self-esteem bias, compared to controls, even in the presence of low explicit self-esteem. In contrast, Cardi, Matteo, Gilbert and Treasure (2014) found that eating disordered individuals had lower implicit self-esteem than controls. In another study, supporting the argument for the need to consider implicit as well as explicit self-esteem, Vanderlinden et al. (2009) found that individuals with eating disorders had higher explicit self-esteem than healthy controls, however there was no significant difference between the two groups in relation to levels of implicit self-esteem. Vanderlinden et al. (2009) also found that positive feedback improved implicit self-esteem in people with eating disorders, but negative feedback had no impact. By comparison, positive feedback improved levels of explicit self-esteem and negative feedback reduced levels of explicit self-esteem in the eating disordered group, whilst the levels of self-esteem in the control group were unaffected by type of feedback.

Despite self-concept clarity being closely associated with levels of self-esteem (Campbell, 1990), the transdiagnostic model fails to comment on this construct when considering the role of 'core low self-esteem' in the maintenance of eating disorders. Self-concept clarity is defined as the extent to which individuals hold a clear, consistent, confident and stable view of the self (Campbell et al., 1996).

Baumgardner (1990) proposes that a high degree of certainty over one's self-concept can contribute to a sense of self-confidence, which is associated with positive affect towards the self, higher self-esteem and a more positive self-view. In comparison, uncertainty about the self-concept, reflected in low levels of self-concept clarity, has been associated with low self-esteem, negative affect towards the self, temporal instability in self-descriptions and poorer mental health (Baumgardner, 1990; Butzer & Kuiper, 2006; Campbell, 1990). These findings indicate that self-concept clarity is likely to have an effect on levels of 'core low self-esteem' and thus may play a role in the maintenance of eating disorders.

To date, no research has specifically investigated self-concept clarity in people with eating disorders. However, given the relationship between self-concept clarity and self-esteem (Campbell, 1990) we would expect this aspect of the self-concept to be low in this client group. The possible discrepancy between explicit and implicit self-esteem in this population (e.g., Cockerham et al., 2009) may also generate uncertainty about the self and create difficulties in maintaining a clear, consistent self-view.

As discussed, there are many aspects of the self-concept that are not captured by the transdiagnostic models (Fairburn et al., 2003) description of 'core low self-esteem'. In addition to implicit self-esteem and self-concept clarity, another dimension of the self that is often evident in individuals with eating disorders (e.g., Bers, Blatt, & Dolinsky, 2004; Strauman, Vookles, Berenstein, Chaiken, & Higgins, 1991) is self-discrepancies between actual (your perceived view of your current self) and ideal (hypothetical beliefs about how you would like to be) selves (Higgins, 1987). Self-discrepancies are likely to be particularly apparent in this clinical population because of the over-evaluation individuals with eating disorders place on

their weight and shape, and their persistent drive to lose weight. Greater actual-ideal self-discrepancies signify the absence of positive outcomes, and are associated with negative emotions (e.g., sadness), low self-esteem (Higgins, 1987; Higgins, Klein, & Strauman, 1985) and poorer psychological wellbeing (Higgins, 1987). Large discrepancies may also impact on the clarity with which individuals view the self (Stopa, 2009), and subsequently reduce levels of self-concept clarity. This aspect of the self-concept is therefore likely to have an impact on 'core low self-esteem' and thus may also be implicated in the maintenance of eating disorder pathology.

The limited understanding of the self-concept in the transdiagnostic model of eating disorders (Fairburn et al., 2003) becomes particularly apparent when it is compared to the conceptualisation of the self provided in other models of social psychology such as Conway and Pleydell-Pearce's (2000) Self-Memory System (SMS) model.

The SMS model (Conway & Pleydell-Pearce, 2000) helps to explain the complex and dynamic nature of the self and its relationship with autobiographical memories. Specifically, the model proposes that the SMS stores conceptual knowledge, beliefs (e.g., "I am intelligent") and autobiographical information (e.g., memories of lifetime periods such as "being at school") about the self and provides a knowledge base from which self-representations are constructed. According to the model, individuals have a stable long-term self which is the result of an interaction between the conceptual knowledge and autobiographical information, and a 'working self' which is constrained by information in the long-term self, but is constructed in response to situational demands (Conway & Pleydell-Pearce, 2000). The working self is therefore constructed based on attitudes towards the self, beliefs about the self, autobiographical memories of the self from past events, and

associated affective and behavioural information (Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004).

Given the limited understanding of the self-concept in the transdiagnostic model, recent studies (e.g., Cooper, Deepak, Grocutt, & Bailey, 2007; Hinrichsen, Morrison, Waller, & Schmidt, 2007; Somerville, Cooper, & Hackmann, 2007) have expanded their conceptualisation of the self and investigated self-imagery in eating disorders. Self-imagery is considered a window to the self and can provide a potent form of self-representation (Stopa, 2009). In accordance with this assertion, research suggests that individuals with eating disorders experience self-images, and that the details within these images encapsulates the negative sense of self characteristic of eating disorders (Cooper et al., 2007; Hinrichsen et al., 2007; Somerville et al., 2007).

Specifically, individuals with BN have described experiencing recurring spontaneous negative self-images when thinking about their eating, shape and weight (Hinrichsen et al., 2007) and prior to vomiting (Somerville et al., 2007). Individuals with AN have also described recurrent and vivid negative self-images associated with looking fat (e.g., walking down the street and looking fatter than other people). All of these images reflected a negative perception of the individual's body shape and size, and were accompanied by feelings of shame, sadness and anxiety (Cooper et al., 2007; Hinrichsen et al., 2007; Somerville et al., 2007).

The self-images were also associated with autobiographical childhood memories of negative comments about weight, shape and appearance (Somerville et al., 2007) and early memories of rejection and worthlessness (Cooper et al., 2007), and abandonment and humiliation (Hinrichsen et al., 2007). Collectively, these findings suggest that negative self-images may play a role in the maintenance of

eating disorders and may be associated with the triggering of behavioural symptomology (Hinrichsen et al., 2007).

These empirical findings are consistent with the conceptualisation of the working self in the SMS model (Conway & Pleydell-Pearce, 2000), such that negative self-images, which represent the individual's negative sense of self, and associated autobiographical memories of past events are experienced in response to situational demands e.g., thinking about weight and shape or before vomiting. Similar results regarding the nature of self-imagery have been found in the social anxiety literature (e.g., Hackmann, Surawy, & Clark, 1998) and this led to the proposal that self-images and their associated memories reflect the working self in the SMS model (Hulme, Hirsch & Stopa, 2012). The current study adopts this hypothesis and proposes that the negative self-images experienced by individuals with eating disorders represent the working self that is retrieved when thinking about eating, shape or weight. The negative content and affect connected with these images (e.g., Cooper et al., 2007; Hinrichsen et al., 2007; Somerville et al., 2007) suggest that the working self is likely to be characterised by negative beliefs and attitudes towards the self, uncertainty about the self and negative affect in this population. The negative self-images may therefore contribute to the 'core low self-esteem' inherent in at least some individuals with eating disorders and could be an important target for treatment.

One of the key ideas of the SMS model is that individuals have access to multiple self-representations. To date, the limited research investigating imagery and the self in eating disorders has focused on describing the content of self-images. However, Brewin's (2006) retrieval competition hypothesis helps us to understand how these negative images are accessed and how their accessibility contributes to the

maintenance of 'core low self-esteem'. Brewin (2006) proposes that multiple self-representations all compete for retrieval and that the more often internal items in memory are retrieved the more likely they are to be activated, thus winning the retrieval competition. The repeated activation of the negative working self in individuals with eating disorders therefore increases the accessibility of this negative self-representation, increasing the likelihood of it winning the retrieval competition. The repeated activation of the negative working self also inhibits the accessibility of positive self-representations resulting in the negative self-view being maintained (Brewin, 2006). If self-images do reflect an individual's current working self, then Brewin's (2006) hypothesis suggests that one way to improve the negative working self-concept is to retrieve self-images connected with positive autobiographical memories.

Previously this idea had only been tested in the social anxiety literature (Hulme et al., 2012; Stopa, Brown, & Hirsch, 2011); however, a recent study by Farrar, Stopa and Turner (2015) investigated this hypothesis in individuals with high body dissatisfaction, a related, albeit distinct aspect of eating disorders. Farrar et al. (2015) found that manipulating the retrieval of self-images had an impact on an individual's self-representation and sense of self. Specifically, retrieving a positive self-image of the body resulted in a more functional working self (measured in terms of self-esteem and self-concept clarity) compared to when a negative self-image was retrieved (Farrar et al., 2015).

The study conducted by Farrar et al. (2015) concentrated on one aspect of eating disorders, namely body satisfaction, and manipulated self-images of high and low body satisfaction, such that individuals were asked to retrieve either a positive or negative self-image of their body. However, the transdiagnostic model (Fairburn et

al., 2003) outlined above stresses the importance of the more general phenomenon of global negative views of the self in the maintenance of eating disorders. The present study therefore aimed to extend the work by Farrar et al. (2015) by investigating the impact of accessing general positive and negative images of the self (e.g., 'a time when I felt good about myself' rather than 'a time when I felt good about my body') on the working self-concept. To summarise, a key difference between the two studies is that in the present study participants were asked to access a positive or negative image of the whole self. If positive self-images are found to improve the working self-concept they may also improve levels of 'core low self-esteem'. This may enable individuals to successfully engage in therapy and increase the likelihood of positive clinical outcomes. The results of this study will also provide further insight into the role of self-imagery in the maintenance of eating disorders.

To achieve these aims, the experimental paradigm used by Farrar et al. (2015) was employed. In order to extend the literature in this field and assess the clinical utility of self-imagery in the eating disorder population, this study applied the transdiagnostic perspective of eating disorders (Fairburn et al., 2003) and recruited individuals who met diagnostic criteria (APA, 2013) for, or were at high risk of developing, AN, BN or OSFED.

In order to investigate the effects of manipulating positive and negative self-images on the self-concept, it is important to operationalise the working self-concept and define measureable components. Consistent with previous research in this area, (e.g., Farrar et al; Hulme et al., 2012), and based on the impact these factors are likely to have on 'core low self-esteem' and thus the maintenance of eating disorders (as described above), self-esteem (implicit and explicit) and self-concept clarity were used as a proxy for the working self-concept in this study. In order to extend the

current literature and account for the impact this aspect of the self-concept may have on 'core low self-esteem', actual-ideal self-discrepancy was also used in this study as another proxy for the working self-concept. The impact self-imagery may have on each of these three aspects of the self-concept will now be discussed.

Previous research (e.g., Farrar et al., 2015; Hulme et al., 2012) suggests that accessing conscious images of the self can affect levels of explicit self-esteem, indicating that this is also likely to be the case in the current study. If this is found to be true, self-imagery techniques could be an effective way to improve this aspect of the self in individuals with eating disorders.

In comparison to explicit self-esteem which is thought to be formed through conscious accessible beliefs about the self (Rosenberg, 1969), Hetts and Pelham (2001) propose that implicit self-esteem is primarily formed through unconscious automatic processing. Therefore, unlike explicit self-esteem, implicit self-esteem is likely to be relatively unaffected by conscious self-imagery manipulation. In accordance with this hypothesis, Farrar et al. (2015) found that positive and negative self-imagery retrieval had no impact on levels of implicit self-esteem. In contrast, Hulme et al. (2012) found that the retrieval of positive and negative self-images does affect levels of implicit self-esteem, and consequently, they suggest that self-imagery may be able to effect automatic, unconscious aspects of the self-concept. Given the inconsistent findings in the literature, it is necessary for the current study to measure implicit self-esteem in order to provide further insight into the effect self-imagery may have on this aspect of the self-concept.

In a sample of participants with high body dissatisfaction, Farrar et al. (2015) found that accessing a negative self-image reduced self-concept clarity, whereas accessing a positive self-image had no impact on this aspect of the self-concept.

However, studies investigating the impact of self-imagery on the self-concept in other disorders have found that retrieving a positive self-image significantly increased self-concept clarity and retrieving a negative self-image significantly reduced self-concept clarity (Hulme et al., 2012; Stopa et al., 2011). As only one study within the field of eating disorders (namely Farrar et al., 2015) has investigated the impact of self-imagery on self-concept clarity, the current study will include a measure of this construct in order to further understand the effect of self-imagery on this aspect of the self-concept.

Given that the current study involves individuals retrieving an image of the whole self instead of just their body (as in Farrar et al., 2015), it is possible that this image may be more representative of an individual's self-view, and have a greater impact on levels of self-concept clarity.

To date the impact of self-imagery on actual-ideal self-discrepancies has not been investigated. However, given that low self-esteem, inherent in individuals with eating disorders (e.g., Bardone-Cone et al., 2010; Kelly et al., 2014), is associated with greater actual-ideal self-discrepancies (Higgins, 1989), the current study will investigate whether self-imagery has an impact on this aspect of the self-concept. Actual-ideal self-discrepancies can also have a negative impact on psychological wellbeing (Higgins, 1987), further highlighting the importance of measuring this aspect of the self-concept in the current study. As eating disorders are characterised by a negative sense of self, it makes theoretical sense to predict that retrieving a negative self-image will increase the magnitude of discrepancy between an individual's actual and ideal self, and that retrieving a positive self-image will have the opposite effect and decrease the magnitude of discrepancy between the actual and ideal self. Given that self-discrepancies may also impact on the clarity with

which individuals view the self (Stopa, 2009), it is possible that positive self-imagery retrieval may increase self-concept clarity and negative self-imagery retrieval may result in a reduction in self-concept clarity.

2.1.1 Hypotheses

The transdiagnostic model (Fairburn et al., 2003) suggests that 'core low self-esteem' is a key maintaining mechanism in eating disorder symptomology. This study therefore aimed to extend the literature and investigate the impact of accessing positive and negative images of the whole self on three different aspects of the self-concept that are likely to be related to 'core low self-esteem' and thus, implicated in the maintenance of eating disorders. To explore the clinical utility of self-imagery manipulation this study recruited individuals who met diagnostic criteria for, or were at high risk of developing, an eating disorder.

As this is a new area of research, the first aim was to explore whether participants with or at risk of eating disorders would be able to retrieve a positive image of the whole self. Assuming that this was possible, it was hypothesised that accessing positive and negative self-images would be associated with the retrieval of different working self-concepts. The primary hypotheses of this study were:

1. Accessing a positive self-image will lead to an increase in positive explicit state self-esteem and a reduction in negative explicit state self-esteem and actual-ideal self-discrepancies.
2. Accessing a negative self-image will lead to an increase in negative explicit state self-esteem and actual-ideal self-discrepancies and a reduction in positive explicit state self-esteem.

Previous research has yielded inconsistent findings regarding the impact of self-imagery retrieval on implicit self-esteem and self-concept clarity (Farrar et al., 2015; Hulme et al., 2011; Stopa et al., 2011). Therefore, it is not possible to make a directional hypothesis in relation to these aspects of the self-concept. This study therefore aimed to explore whether retrieving a positive or negative self-image has an effect on implicit self-esteem and self-concept clarity in this population.

Given that the proxies for the working self employed in this study are all related to affect (e.g., Baumgardner, 1990; Higgins, 1987; Kelly et al., 2014), a secondary hypothesis predicted that retrieving a positive self-image would increase positive affect and decrease negative affect, and retrieving a negative self-image would have the opposite effect.

2.2 Method

2.2.1 Design

The study used a mixed experimental design with one between-subjects factor with two levels (self-imagery condition; positive and negative) and one within-subjects factor with two levels (time; pre and post-imagery manipulation). The dependent variables included measures of explicit state self-esteem, implicit self-esteem, state self-concept clarity, state self-discrepancy and state affect.

2.2.2 Participants

The study recruited female university students who met diagnostic criteria for, or were at risk of developing, an eating disorder.[11] Participants interested in taking part in the study were therefore initially asked to complete the following screening questionnaire on an electronic survey database.

Eating Disorder Examination-Questionnaire 6.0 (Fairburn & Beglin, 1994). The EDE-Q is a 28-item self-report version of the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), which is an investigator-based interview. Research suggests that the EDE-Q is an effective measure for detecting the presence of eating disorders in various clinical and high-risk populations (Aardoom, Dingemans, Slof Op't Landt, & Van Furth, 2012). The questionnaire measures the frequency of a range of disordered eating behaviours (e.g., self-induced vomiting, laxative misuse). It comprises four subscales that measure restraint, eating concern, shape concern and weight concern. The EDE-Q also provides a 'global' score by summing the four subscales scores and dividing this number by four (the number of subscales completed). It has good concurrent validity (Mond, Hay, Rodgers, Owen, & Beumont, 2004), and high internal consistency and test-retest reliability (Berg, Peterson, Frazier, & Crow, 2011).

[11] Female participants were recruited as this reflects the literature indicating that eating disorders are more prevalent in the female population compared to the male population (Merikangas et al., 2010). Female university students were recruited as research indicates that eating disorders and extreme dieting, often associated with eating disorders (Fairburn, 2008), is relatively common in this population (Sepulveda, Carrobles, & Gandarillas, 2008; Wardle, 1980).

In order to recruit individuals who had or were at risk of developing an eating disorder, only participants who obtained a 'global' EDE-Q score above 2.7, which represents one standard deviation above the community sample mean (*M* = 1.55, *SD* = 1.21; Fairburn & Beglin, 1994), were invited to take part in the experimental study, which involved completing the imagery manipulation task.

There was no significant difference between the 'global' EDE-Q scores of participants in the positive (*M* = 3.80, *SD* = .60) and negative (*M* = 3.61, *SD* = .56) imagery condition, $t(64) = 1.33$, $p = .19$. The EDE-Q demonstrated acceptable internal consistency in the current sample ($\alpha = .68$).

Three hundred and fifty-eight participants completed the screening questionnaire (study adverts are shown in Appendix B). Of these, 121 met the inclusion criteria and were invited to attend the experimental session. In total, 70 participants completed the experimental session. Three participants were excluded from the study and one participant withdrew from the study during the imagery manipulation task as she found it distressing. One participant, who took part in the negative imagery condition, was excluded because she generated an image that was related to a negative situation one of her family members was involved in, as opposed to a negative image of herself. Two participants, who took part in the positive imagery condition, were excluded because the image they generated was not sufficiently positive and they failed to meet the manipulation check criteria (detailed below). The final sample consisted of 66 participants aged 18-48. There was no significant difference between the age of the participants in the positive (*Mdn* = 19.00) and negative (*Mdn* = 19.00) self-imagery conditions, $U = 521.50$, $z = -.31$, $p = .75$. The mean length of time between screening and completion of the experimental session was 13.81 days (*SD* = 7.01) in the positive imagery condition and 14.42 days

(*SD* = 6.16) in the negative imagery condition, and there was no significant difference between the two conditions in respect of this factor, $t(64) = -.37$, $p = .71$. Participants were randomly assigned to the positive or negative imagery condition[12] and given course credit or payment for participation.[13] A recruitment diagram is detailed in Appendix C.

In order to identify whether participants met DSM-5 criteria (APA, 2013) for a diagnosis of an eating disorder, and to describe the characteristics of the sample, the following semi-structured interview was carried out with each participant who took part in the experimental session.

Eating Disorder Examination Edition 17.0 (EDE; Fairburn, Cooper, & O'Connor, 2014). The EDE is a widely used, reliable and valid (Guest, 2000) investigator-based interview. It is designed to assess the cognitive and behavioural features associated with eating disorder psychopathology (e.g., the number of episodes of the behaviour and in some instances the number of days on which the behaviour occurred). In this study, the diagnostic items of the EDE were administered to participants. On average, the interview took 45 minutes to complete. The EDE is scored in relation to the DSM-5 eating disorder diagnoses (APA,

[12] The website www.randomizer.org was used to randomly assign participants to one of the two imagery conditions.

[13] One credit/£1.50 was provided for completion of the screening questionnaire. One credit/£1.50 was provided for every 15 minutes each participant took part in the experimental study. The maximum credit/payment provided was eight credits/£12.00 for completion of the experimental session.

2013).[14] After scoring the EDE a diagnosis of AN, BN, BED, OSFED or UFED can be made. The current study found that each participant could be assigned to one of five different groups. The name of each group, associated inclusion criteria and the number of participants that met the criteria for each group is detailed in Table 3.

[14] Guidance on scoring the EDE is provided in the manual and during EDE training, which the researcher attended at The University of Oxford prior to carrying out the interview with participants.

Table 3

Characteristics of the Participants Assessed using the EDE and Mean Global Scores on the EDE-Q in Each Experimental Group

Group Name	Group Inclusion Criteria	Number of Participants in the Positive Imagery Condition (Global EDE-Q Scores)	Number of Participants in the Negative Imagery Condition (Global EDE-Q Scores)
Bulimia Nervosa	Participants met DSM-5 diagnostic criteria for BN (APA, 2013)	2 (3.75)	2 (3.88)
OSFED Atypical Anorexia Nervosa	Participants met DSM-5 diagnostic criteria for Atypical AN (APA, 2013)	1 (4.81)	1 (4.63)
OSFED Low Frequency Bulimia Nervosa	Participants met DSM-5 diagnostic criteria for low frequency BN (APA, 2013)	9 (3.79)	7 (3.55)
Subclinical Eating Disorder	Participants met all DSM-5 criteria for BN or OSFED Low Frequency BN apart from the criteria relating to self-evaluation of body shape and weight. Participants' self-evaluation was not unduly influenced by their body shape and/or weight hence participants were classified as subclinical.	4 (3.71)	4 (3.25)
Dieter	Participants were attempting to lose weight and reported some concerns about their body shape and weight. Participants may have engaged in compensatory behaviours e.g., excessive exercise. However, they were in the normal weight range, did not report any objective binge eating episodes and did not meet DSM-5 criteria for any of the eating disorder diagnoses.	17 (3.68)	19 (3.23)

A Pearson's chi-square test demonstrated that there was no relationship between imagery condition and eating disorder diagnostic status, indicating that

there was no significant difference between the number of participants in the positive and negative imagery condition that met DSM-5 diagnostic criteria for an eating disorder, χ^2 (1, N = 66) = .27, p = .60.

2.2.3 Descriptive Measures

Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1989). The RSE is a 10-item self-report questionnaire measuring explicit self-esteem. Items are scored on a 4-point likert scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Once items 3, 5, 8, 9 and 10 have been reverse scored the total score ranges from 10-40, with higher scores indicating higher self-esteem (Robins, Hendin, & Trzesniewski, 2001). The RSE has excellent internal reliability (α = .92; Corcoran & Fischer, 1987) and good test-retest reliability over a six-month period (.82; Murrell, Meeks, & Walker, 1991). The reliability of the RSE in this study was good (α = .83). Participants completed the RSE prior to the imagery manipulation task to ensure that levels of trait self-esteem were comparable across the two imagery conditions.

Self-Concept Outcome Measures

State Self-Esteem Scale (SSES; McFarland & Ross, 1982). The SSES is a 12-item self-report questionnaire measuring explicit state self-esteem. Participants rate how much each item describes how they are currently feeling about themselves on a 1 (*not at all*) to 11 (*extremely*) scale. By summing the positively and negatively worded items separately two subscales can be calculated to identify positive and negative self-esteem (McFarland & Ross, 1982). Higher scores on the positive subscale indicate higher positive self-esteem. Lower scores on the negative subscale

indicate lower negative self-esteem. The SSES is a reliable measure (McFarland & Ross, 1982) however; to date there is no data reporting its test-retest reliability. The SSES was administered pre and post-imagery manipulation in this study to measure any changes in explicit state self-esteem. The positive and negative subscales demonstrated good internal consistency in the current sample (baseline: $\alpha = .86$, post-imagery manipulation: $\alpha = .96$ and baseline: $\alpha = .85$, post-imagery manipulation: $\alpha = .92$ respectively). A copy of this measure is provided in Appendix D.

The Self-Esteem Implicit Association Test (SE-IAT; Greenwald & Farnham, 2000). The SE-IAT is a computerised reaction time task that assesses the relative strength of association between two concept categories, and provides a measure of implicit self-esteem. In the current study, the SE-IAT comprised of seven blocks of trials. In each block, participants classified words into categories by pressing one of two keys as quickly as they could without making errors. The category labels used were 'me' (self) and 'not-me' (other) for self-concept and 'positive' and 'negative' for self-attributes. The test words used in each category were taken directly from Cockerham et al.'s (2009) study which measured implicit self-esteem in individuals with BN, and are shown in Table 4.

Table 4

Words Used in the SE-IAT to Represent Each Concept Category

Me	Not-Me	Positive	Negative
Me	They	Valuable	Defective
I	Them	Worthy	Inadequate
Myself	Themselves	Acceptable	Inferior
My	Their	Competent	Weak
Mine	Theirs	Reliable	Worthless
Own	Others	Confident	Critical

The details of the seven blocks of trials used in the SE-IAT in the current study are shown in Table 5. The presentation of blocks three and four and six and seven were counterbalanced within the positive and negative imagery-manipulation groups to avoid order effects (Farnham, Greenwald, & Banaji, 1999). The SE-IAT was designed using Presentation (Version 14.2). It was presented on the full screen of a laptop (Acer, TravelMate 8200). The category labels appeared in the top left and right corners of the laptop screen in green capital letters. Test words appeared in the middle of the screen in white lower case letters. The background screen on the laptop was black. Participants pressed 'E' on the keyboard for test words associated with the left hand category and 'I' for test words associated with the right hand category. Category labels were presented on the screen throughout the duration of each block whereas the test words changed randomly on each trial (with an interval time of 100ms). Errors in categorisation were flagged by a red cross appearing on the

screen for 200ms, after which the next trial was presented without need for correction. The SE-IAT took approximately eight minutes to complete.

Table 5

Structure of the Seven SE-IAT Blocks

Block and number of trials in each block	Function	Words allocated to the left key response	Words allocated to the right key response
1: 24 Trials	Practice	Not-me words	Me words
2: 24 Trials	Practice	Negative words	Positive words
3: 24 Trials	Practice	Not-me words and Negative words	Me words and Positive words
4: 48 Trials	Test	Not-me words and Negative words	Me words and Positive words
5: 24 Trials	Practice	Me words	Not-me words
6: 24 Trials	Practice	Me words and Negative words	Not-me words and Positive words
7: 48 Trials	Test	Me words and Negative words	Not-me words and Positive words

The SE-IAT was scored using Greenwald, Nosek and Banaji's (2003) improved scoring algorithm. Only data from blocks three, four, six and seven were used in the scoring (Greenwald et al., 2003). As recommended in the improved scoring algorithm (Greenwald et al., 2003), trials with response latencies greater than 10,000ms were removed and participants who responded to over 10% of trials in less than 300ms were excluded from analysis. No participants met these criteria and

hence all data were used in the analysis. Error trials were identified and replaced with the block mean latency and an additional 600ms penalty. The means for each block were then calculated and a difference score between the two mean scores on the practice and test blocks (i.e., practice incongruent block (block six) mean score minus practice congruent block (block three) mean score, and test incongruent block (block seven) mean score minus test congruent block (block four) mean score) were calculated. These scores were divided by the pooled standard deviation for trials in block three and six, and block four and seven, respectively. The mean of the resulting scores were averaged to obtain the final score, the IAT-D effect.

The underlying assumption of the IAT is that when the associations presented are congruent with those stored in memory participants will be quicker to respond compared to when the associations are incongruent (Greenwald et al., 2003). Within the SE-IAT, a higher positive IAT-D effect score suggests stronger associations between self and positive words (compared to self and negative words), indicative of more positive implicit self-esteem (Greenwald et al., 2003). In comparison, a negative IAT-D effect score suggests stronger associations between self and negative words, indicative of more negative implicit self-esteem (Greenwald et al., 2003). The SE-IAT has reasonable psychometric properties; it has a test-retest reliability co-efficient of .52 (Greenwald & Farnham, 2000) and its internal validity ranges from .52 to .69 (Greenwald & Farnham, 2000; Bosson, Swann, & Pennebaker, 2000, respectively). The SE-IAT was administered after the imagery manipulation to assess differences between the positive and negative conditions.

State Self-Concept Clarity Scale (SSCCS; Nezlek & Plesko, 2001). The SSCCS is a 4-item self-report questionnaire measuring state self-concept clarity, which is defined as the extent to which self-beliefs are clearly and confidently

defined. It consists of items 1, 4, 8 and 9 of the Self-Concept Clarity Scale (Campbell et al., 1996). Participants rate how much they currently agree with each statement on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Lower scores indicate more clearly and confidently defined self-beliefs. The SSCCS is considered a reliable measure however; the test-retest reliability of this measure is yet to be established (Nezlek & Plesko, 2001). It was administered pre and post-imagery manipulation to detect any changes in self-concept clarity. The SSCCS demonstrated good internal consistency in the current sample (baseline: $\alpha = .80$, post-imagery manipulation: $\alpha = .87$). A copy of this measure is provided in Appendix E.

Self-Discrepancy Index (SDI; Dittmar, Beattie, & Friese, 1996). The SDI measures actual-ideal self-discrepancies. The SDI instructions were recently adapted which enabled it to become a state measure of self-discrepancy (Dittmar, Halliwell, & Stirling, 2009). The state measure was used in the current study. The state SDI requires participants to think about the personal ideals they currently hold about themselves. Participants are asked to write down something they would like to change about themselves and how they would ideally like to be instead. Using a 6-point likert scale (1 *hardly*, 6 *extremely*) participants are then asked to rate each self-discrepancy they generate in terms of how different they currently are from their ideal (magnitude of self-discrepancy) and how concerned they currently are about this difference (importance of self-discrepancy). To score the SDI, the magnitude and importance ratings for each self-discrepancy are multiplied; these products are then summed, and finally, divided by the number of self-discrepancy statements the participant supplied. Scores range from 1 to 36, with higher scores indicating greater self-discrepancy between actual and ideal self. The state SDI is considered a reliable

measure (Dittmar et al., 2009) however; its test-retest reliability is yet to be investigated. Prior to carrying out the imagery manipulation in the current study participants were asked to write down up to five self-discrepancies on the SDI and rate the magnitude and importance of each one. The researcher then wrote down, word for word, the self-discrepancies each participant had listed on the SDI administered post-imagery manipulation, and participants were asked to complete the magnitude and importance ratings for each self-discrepancy again. This approach allowed the researcher to detect any changes in the amount of self-discrepancy between actual and ideal-self pre and post-imagery manipulation. The reliability of the state SDI in this study was good (baseline: $\alpha = .62$, post-imagery manipulation: $\alpha = .85$).

Affect Outcome Measures

Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item self-report questionnaire measuring state positive and negative affect[15]. Participants rate how much each item reflects their current mood on a 1 (*very slightly or not at all*) to 5 (*extremely*) scale. Two subscale scores can then be calculated by summing the positively and negatively worded items separately to obtain a score of positive and negative mood. This measure has good validity and reliability (Watson et al., 1988). Over a one-week time period, Watson et al. (1988) found that the test-retest reliability co-efficient for the PANAS was .81

[15] The PANAS items include interested, disinterested, excited, upset, strong, guilty, scared, hostile, enthusiastic, proud, irritable, alert, ashamed, inspired, nervous, determined, attentive, jittery, active and afraid.

for the negative affect subscale and .79 for the positive affect subscale. The PANAS was administered pre and post-imagery manipulation to identify any change in positive and negative affect. The positive and negative subscales demonstrated high internal consistency in the current sample (baseline: $\alpha = .90$, post-imagery manipulation: $\alpha = .94$. and baseline: $\alpha = .83$, post-imagery manipulation: $\alpha = .90$ respectively). A copy of this measure is provided in Appendix F.

2.2.4 Experimental Task: Imagery Manipulation

The imagery scripts used by Farrar et al. (2015) were adapted to create two scripts to help participants retrieve a positive or negative image of the self. Once participants had identified a time when they felt positive or negative about themselves they were asked to recreate the image they had of themselves in their mind as vividly as possible and describe the image to the researcher in as much detail as possible. Participants were then asked questions about the feelings and emotions towards the self the image evoked. At the end of the imagery interview participants were instructed to hold the self-image in mind whilst they completed the post manipulation measures. To ensure the imagery interview helped participants access the desired image and to obtain feedback on the experimental session the study was initially piloted with six undergraduate students (three in each imagery condition) who met the study inclusion criteria. Small amendments were made to the scripts after the pilot. The final scripts are provided in Appendices G-H.

Manipulation Checks

During the imagery interview participants were asked to rate how positive/negative the image they retrieved was on a scale of 0 (*not at all positive/negative*) to 100 (*extremely positive/negative*). If participants responded with a number lower than 60 they were asked to think of another situation and the interview was started again. Participants were also asked to rate the vividness of the self-image they retrieved on a scale of 0 (*not at all vivid*) to 100 (*extremely vivid*). If participants rated the vividness of the image as less than 60 they were asked for more details about the image to increase its vividness. After completing the post-imagery manipulation measures participants were asked to rate the percentage of time they were able to hold the self-image in mind whilst they completed the questionnaires and the IAT on a scale of 0% (*not at* all) to 100% (*all the time*).

2.2.5 Materials

The experimental session took place in a research lab at a university. The self-report questionnaires were all paper-based. An Acer Travelmate 8200 series laptop was used to administer the SE-IAT. An Olympus WS-45OS Digital Voice Recorder was used to record the self-imagery interviews and the first 10 EDE interviews for quality control purposes. Finally, a Seca column scales with a telescopic measuring rod was used to measure participants height and weight.[16]

[16] Height and weight measurements were taken to calculate each participants' body mass index (BMI). This information is collected as part of the EDE in order to identify whether participants meet DSM-5 criteria for AN or OSFED.

2.2.6 Procedure

Interested participants were asked to complete the online EDE-Q screening questionnaire. Participants who met the inclusion criteria were emailed by the researcher and invited to take part in the experimental session. Participants were then randomly allocated to the positive or negative imagery condition.

At the start of the experimental session participants were provided with the information sheet (Appendices I-J) and completed the consent form (Appendices K-L). Participants then completed the RSE, SSES, SSCCS, SDI and PANAS. The questionnaires were counterbalanced to control for order effects. The researcher then guided the participants through the positive or negative self-imagery interview, which was audio recorded. Following the imagery interview, participants completed the SSES, SSCCS, SDI and PANAS again, in the counterbalanced order. Next participants completed the IAT and answered the final manipulation check questions. To try to eliminate any effects of the imagery manipulation task on the EDE, participants were then offered a break and completed a word search (Appendix M). The researcher then carried out the EDE with participants. If participants' responses during the EDE indicated that they had or were at risk of developing an eating disorder the researcher had an open discussion with the participant about their responses and how they could access treatment/support. Next, participants' height and weight measurements were taken. Participants then received a verbal debrief and a written debrief statement (Appendix N). Given the possibly distressing impact of the negative imagery manipulation, a neutral imagery task was offered to all participants who took part in this condition at the end of the session (Appendix O). Twelve participants accepted this offer.

The completion of the experimental session took between one and two hours for each participant.

2.2.7 Ethics

The study received ethical approval from The University of Southampton School of Psychology Ethics Committee (Appendix P).

2.2.8 Data Analysis

As a range of effect sizes were reported by Farrar et al. (2015) a conservative approach was taken to data collection. To increase the possibility of a true effect being detected, an effect size of 0.2, an alpha value of .05 and a power value ($1 - \beta$) of 0.85 were used in an a priori power calculation carried out using G power (Version 3.1). This indicated that a total sample size of 60 was required. Data from 33 participants in each self-imagery condition were included in the final analysis. Depending on whether the data met parametric assumptions, independent t-tests or Mann Whitney U tests were carried out to investigate whether there were any significant differences between the two self-imagery conditions on the baseline measures, SE-IAT and manipulation checks. A number of 2 (Imagery condition [positive and negative]) x 2 (Time [pre and post imagery manipulation]) mixed ANOVAs were carried out to analyse all of the other variables. Post hoc independent and repeated measures t-tests applying the Bonferroni correction (to reduce the likelihood of making a type one error) were employed to interpret the reported interactions (Field, 2013).

2.3 Results

2.3.1 Data Screening

Initially, the data were screened for normality of distribution and homogeneity of variance to check that the assumptions of parametric tests were met. Data were also screened for outliers however; as these were valid data points they were all included within subsequent analysis. Where parametric assumptions were violated, data were transformed using log, square root, reciprocal or reverse score transformations (Field, 2013).

Where transformations improved normality and skewness, the transformed data were entered into the analysis.[17] If transformations did not improve the distribution, non-parametric tests were used in simple comparisons. However, where mixed model ANOVAs were required, untransformed data were used as Howell (2004) reports that ANOVAs are extremely robust against violations of normality. Mixed model ANOVAs also allow interactions to be investigated as well as main effects. The effect these violations may have had were kept in mind whilst interpreting the data.

2.3.2 Descriptive Statistics

Table 6 shows the mean scores and standard deviations for all the descriptive measures administered at baseline and post manipulation for the two imagery conditions.

[17] Where transformed data was used, means and standard deviations from untransformed data are presented to increase clarity.

A series of independent t-tests revealed that there were no significant differences between the positive and negative imagery condition on any of the baseline measures (*p* values ranged from .20 to .89). This suggests that there were no differences between the two conditions prior to the imagery manipulation.

Table 6

Mean Scores and Standard Deviations (in parenthesis) for all of the Measures administered at Baseline and Post Manipulation for each Self-Imagery Condition

Measure	Positive Self-Imagery Condition (*n* = 33)		Negative Self-Imagery Condition (*n* = 33)	
	Baseline	Post	Baseline	Post
RSE	17.27 (4.18)		16.09 (4.13)	
State Positive Self-Esteem	44.55 (8.78)	51.00 (13.42)	41.61 (9.71)	31.39 (12.68)
State Negative Self-Esteem	22.33 (8.47)	15.06 (9.10)	21.70 (8.29)	33.09 (8.58)
State Self-Concept Clarity	13.79 (3.83)	12.27 (4.75)	14.21 (3.14)	14.48 (3.06)
State Self Discrepancy	18.78 (5.24)	14.81 (7.56)	19.68 (3.38)	26.73 (5.27)
State Positive Affect	27.64 (8.20)	32.85 (10.16)	27.91 (7.64)	22.18 (8.49)
State Negative Affect	17.42 (6.26)	15.58 (7.20)	17.06 (5.82)	24.55 (7.86)
IAT D Effect Score		0.08 (0.73)		-0.03 (0.60)

2.3.3 Imagery Manipulation Checks

There was no significant difference between the two imagery conditions in terms of how positive or negative the retrieved self-image was, $t(59.36) = .56$, $p =$

.58. The participants in the positive and negative imagery condition rated the self-image they retrieved as equally positive (M = 81.64, SD = 11.70) or negative (M = 80.21, SD = 8.78) respectively. There was no significant difference between the positive (Mdn = 85.00) and negative (Mdn = 85.00) condition on the vividness of the self-image retrieved, U = 520.20, z = -.31, p = .76. There was no significant difference between the positive (Mdn = 85.00) and negative (Mdn = 90.00) imagery condition on the percentage of time participants were able to hold the self-image in mind whilst completing the post-imagery manipulation questionnaires, U = 455.50, z = -1.16, p = .25. There was no significant difference between the positive (M = 28.70, SD = 19.85) and negative (M = 35.61, SD = 22.80) condition on the percentage of time participants were able to hold the self-image in mind whilst completing the post-imagery manipulation IAT, $t(64) = -1.31$, p = .19. This suggests that participants in the positive and negative condition were able to hold the image they had of themselves in mind for an equal amount of time whilst completing the post-imagery manipulation measures. Overall, the manipulation check measures carried out during and after the imagery manipulations all indicate that there were no significant differences between the positive and negative condition.

2.3.4 Self-Concept Measures

Explicit state positive self-esteem. There was a significant main effect of condition, $F(1, 64) = 19.63$, $p < .001$, partial $\eta^2 = .24$, no main effect of time, $F(1,64) = 2.74$, $p = .10$, partial $\eta^2 = .04$, but a significant interaction between time and condition, $F(1,64) = 53.96$, $p < .001$, partial $\eta^2 = .46$. Figure 1 illustrates the interaction. Post hoc analysis indicated that positive self-esteem significantly increased after the imagery manipulation in the positive condition, $t(32) = -3.59$, $p <$

.001, r = .54, whereas it significantly decreased post-imagery manipulation in the negative condition, $t(32) = 7.40$, $p < .001$, $r = .80$. The positive imagery condition also reported significantly higher levels of positive self-esteem after the imagery manipulation compared to the negative condition, $t(64) = 6.10$, $p < .001$, $r = .61$.

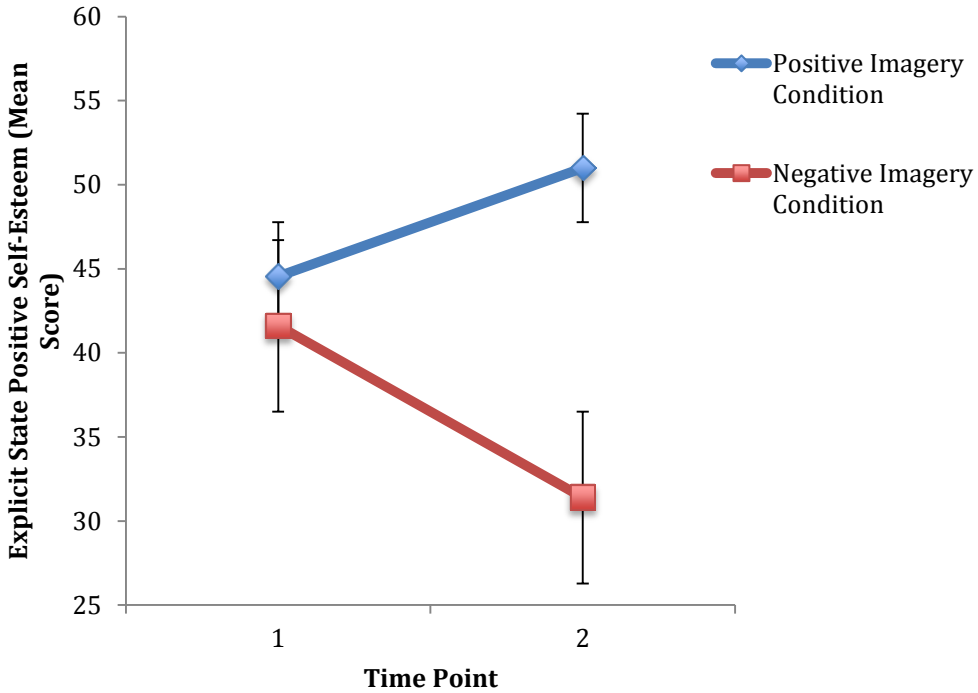


Figure 1. Mean (standard error) pre and post explicit state positive self-esteem scores for the positive and negative self-imagery conditions.

Explicit state negative self-esteem. There were significant main effects of condition, $F(1,64) = 21.04$, $p < .001$, partial $\eta^2 = .25$ and time, $F(1,64) = 4.70$, $p = .034$, partial $\eta^2 = .07$, and a significant interaction between time and condition, $F(1,64) = 96.47$, $p < .001$, partial $\eta^2 = .60$. Figure 2 illustrates the interaction. Post hoc analysis indicated that negative self-esteem significantly increased in the negative condition after the imagery manipulation, $t(32) = -8.86$, $p < .001$, $r = .84$, whereas it significantly decreased post-imagery manipulation in the positive condition, $t(32) = 5.20$, $p < .001$, $r = .68$. The negative condition also reported

significantly higher levels of negative self-esteem after the imagery manipulation compared to the positive condition, $t(64) = -8.28$, $p < .001$, $r = .72$.

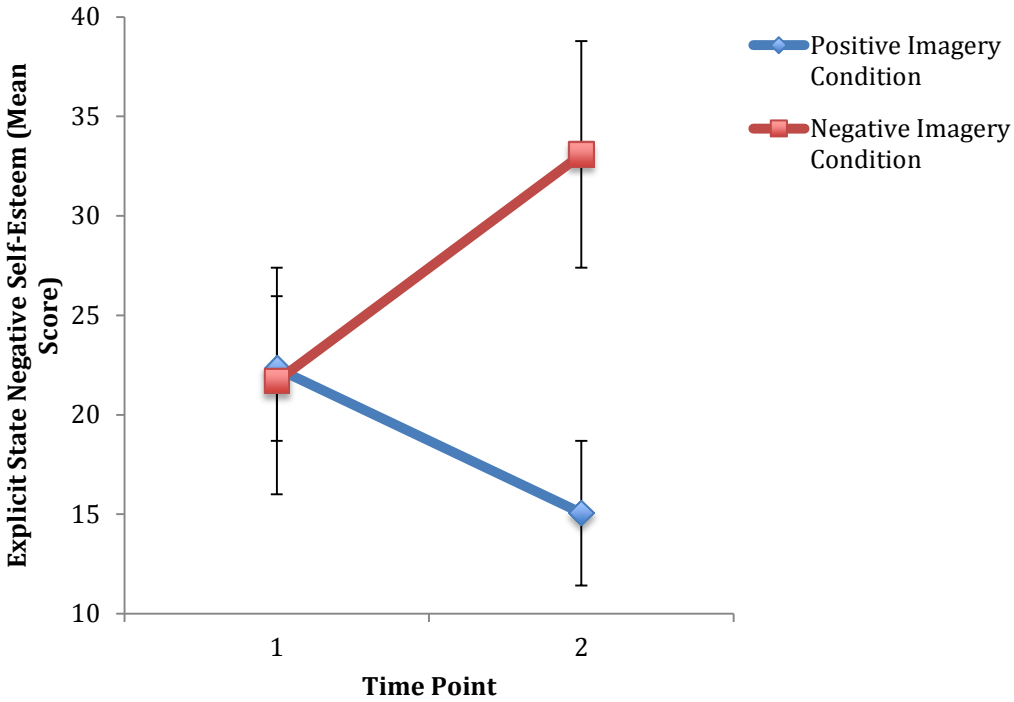


Figure 2. Mean (standard error) pre and post explicit state negative self-esteem scores for the positive and negative self-imagery conditions.

Implicit self-esteem. An independent t-test demonstrated that there was no significant difference between the positive ($M = .08$, $SD = .13$) and negative ($M = -.03$, $SD = .10$) imagery condition on levels of implicit self-esteem after the imagery manipulation, $t(64) = 0.55$, $p = .58$, $r = .07$.

State self-concept clarity. There was no significant main effect of condition, $F(1,64) = 2.25$, $p = .14$, partial $\eta^2 = .03$, but there was a significant main effect of time, $F(1,64) = 4.70$, $p = .031$, partial $\eta^2 = .07$, and a significant interaction between time and condition, $F(1,64) = 9.73$, $p = .003$, partial $\eta^2 = .13$. Figure 3 illustrates this

interaction. Post hoc analysis indicated that levels of state self-concept clarity significantly decreased post-imagery manipulation in the positive condition, $t(32) = 3.27$, $p = .003$, $r = .50$. However, there was no significant difference between pre and post state self-concept clarity scores in the negative condition, $t(32) = -.81$, $p = .43$, $r = .14$. There was also no significant difference between the two imagery conditions post manipulation on this measure, $t(54.72) = -2.25$, $p = .028$, $r = .29$.

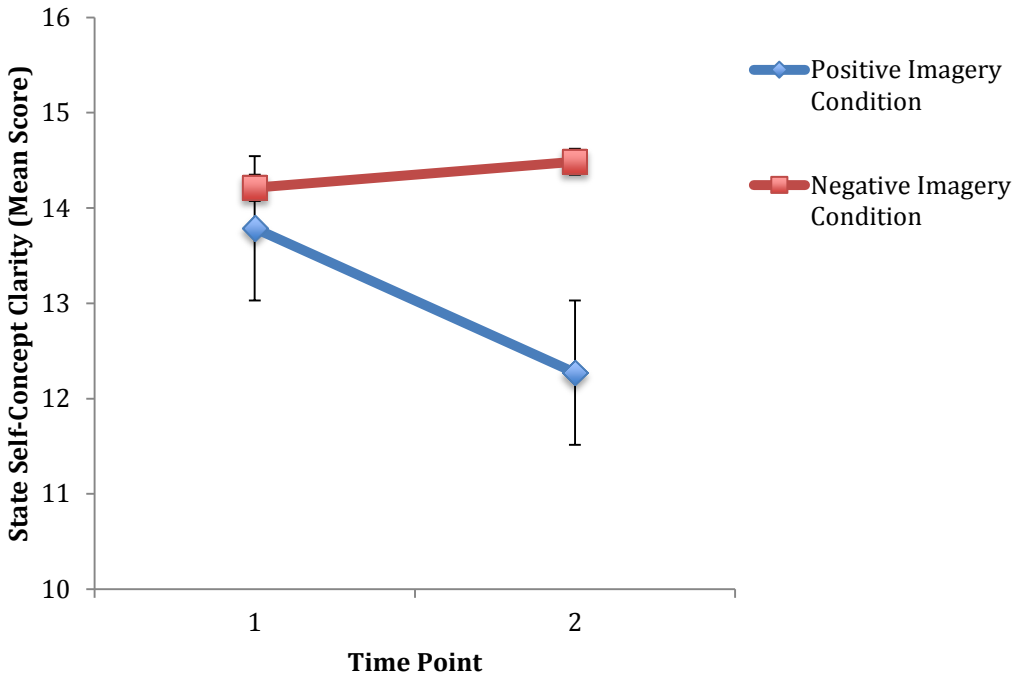


Figure 3. Mean (standard error) pre and post state self-concept clarity scores for the positive and negative self-imagery conditions.

State self-discrepancies. There were significant main effects of condition, $F(1,64) = 27.94$, $p < .001$, partial $\eta^2 = .30$ and time, $F(1,64) = 5.86$, $p = .018$, partial $\eta^2 = .08$, and a significant time by condition interaction, $F(1,64) = 75.14$, $p < .001$, partial $\eta^2 = .54$. Figure 4 illustrates the interaction. Post hoc analysis indicated that self-discrepancies significantly decreased after the imagery manipulation in the positive condition, $t(32) = 3.47$, $p < .001$, $r = .51$ and significantly increased post-imagery manipulation in the negative condition, $t(32) = -12.82$, $p < .001$, $r = .91$. The negative condition also reported significantly higher levels of self-discrepancies after the imagery manipulation compared to the positive condition, $t(64) = -7.43$, $p < .001$, $r = .68$.

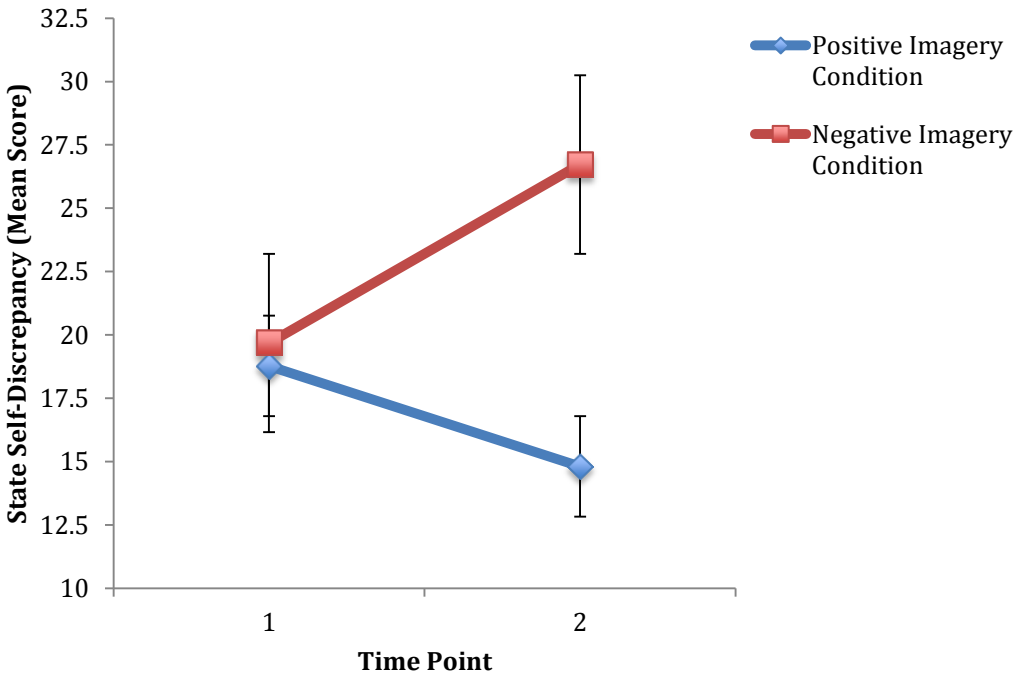


Figure 4. Mean (standard error) pre and post state self-discrepancy scores for the positive and negative self-imagery conditions.

2.3.5 Affect Measures

State Positive Affect Scale. There was a significant main effect of condition, $F(1,64) = 6.63$, $p = .012$, partial $\eta^2 = .09$, no effect of time, $F(1,64) = 0.14$, $p = .71$, partial $\eta^2 = .002$, but a significant interaction between time and condition, $F(1,64) = 61.17$, $p < .001$, partial $\eta^2 = .49$. Figure 5 illustrates the interaction. Post hoc analysis indicated that positive affect significantly increased post-imagery manipulation in the positive condition, $t(32) = -4.97$, $p < .001$, $r = .67$, and significantly decreased after the imagery manipulation in the negative condition, $t(32) = 6.19$, $p < .001$, $r = .74$. The positive condition also reported significantly higher levels of positive affect after the imagery manipulation compared to the negative condition, $t(64) = 4.63$, $p < .001$, $r = .50$.

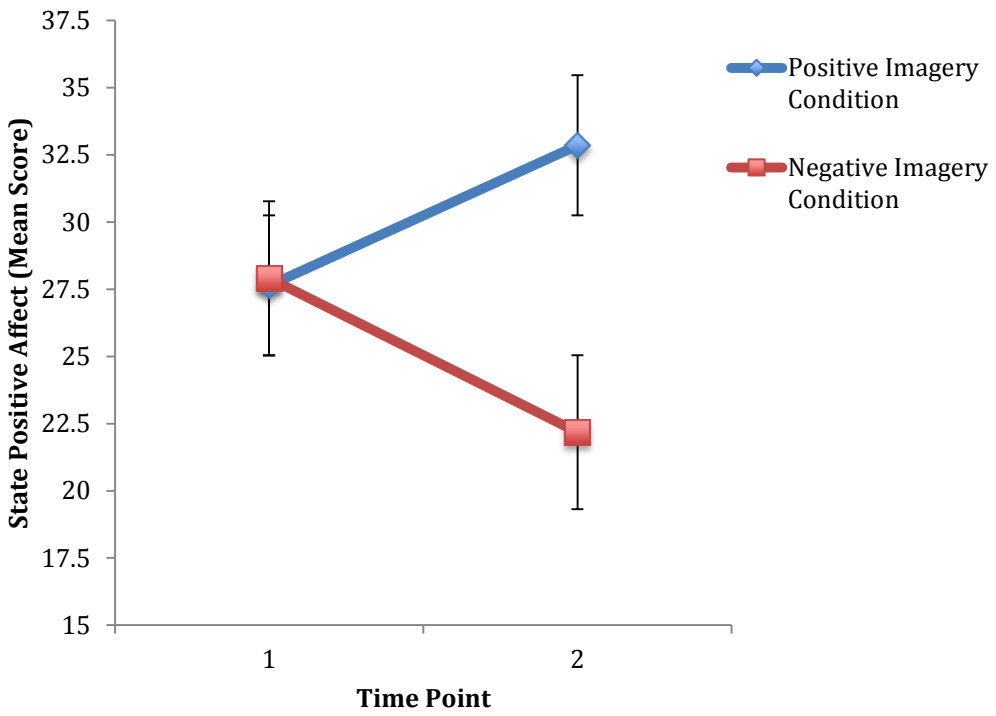


Figure 5. Mean (standard error) pre and post state positive affect scores for the positive and negative self-imagery conditions.

State Negative Affect Scale. There were significant main effects of condition, $F(1,64) = 8.46$, $p = .005$, partial $\eta^2 = .12$ and time, $F(1,64) = 12.49$, $p < .001$, partial $\eta^2 = .16$, and a significant interaction between time and condition, $F(1,64) = 34.24$, $p < .001$, partial $\eta^2 = .35$. Figure 6 illustrates the interaction. Post hoc analysis indicated that levels of negative affect significantly increased after the imagery manipulation in the negative condition, $t(32) = 7.51$, $p < .001$, $r = .80$, and significantly decreased post-imagery manipulation in the positive condition, $t(32) = -2.68$, $p = .011$, $r = .43$. The positive condition also reported significantly lower levels of negative affect after the imagery manipulation compared to the negative condition, $t(52.59) = 6.32$, $p < .001$, $r = .66$.

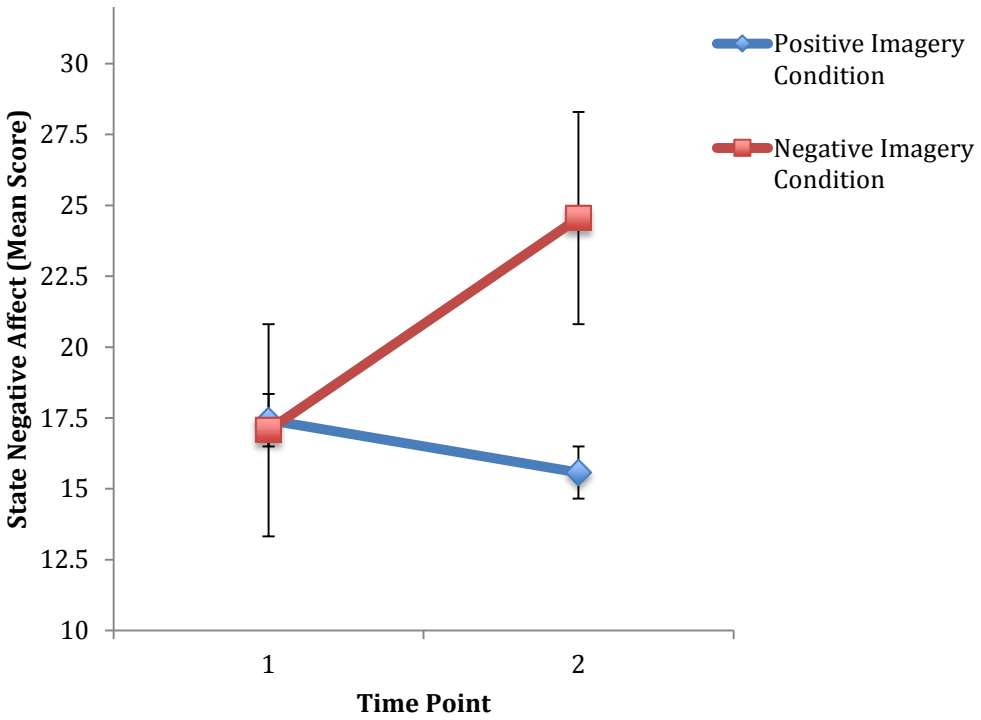


Figure 6. Mean (standard error) pre and post state negative affect scores for the positive and negative self-imagery conditions.

To investigate whether similar patterns of results were found in participants with eating disorders the analyses described above were repeated with the eating disordered sample alone (see Appendix Q), although due to the small sample size these were likely to be underpowered.

2.4 Discussion

The transdiagnostic model (Fairburn et al., 2003) suggests that 'core low self-esteem' may, at least for some individuals, play a central role in the maintenance of eating disorders. Given that self-imagery may be effective in accessing and adapting sense of self (Farrar et al., 2015), this study initially aimed to investigate whether individuals with, or at risk of, eating disorders could retrieve a positive image of the whole self. With the exception of two (who were excluded), all participants were able to retrieve a positive image of themselves related to a time when they felt happy, confident or relaxed. The second aim of the study was to investigate the impact of manipulating positive and negative self-images on three aspects of the self-concept, namely state self-esteem, state self-concept clarity and state actual-ideal self-discrepancies. In accordance with the hypotheses, holding a positive self-image in mind resulted in a significant increase in positive explicit self-esteem and a significant reduction in negative explicit self-esteem and actual-ideal self-discrepancies. In comparison, holding a negative self-image in mind resulted in a significant increase in negative explicit self-esteem and actual-ideal self-discrepancies and a significant reduction in positive explicit self-esteem. In contrast to explicit self-esteem, the levels of implicit self-esteem did not differ between the two groups after the imagery manipulation. Retrieving a positive self-image also led

to a significant reduction in state self-concept clarity; however, negative self-imagery did not have a significant impact on this aspect of the self-concept.

In accordance with the secondary hypothesis, retrieving a positive self-image resulted in an increase in state positive affect and a reduction in state negative affect. The opposite was found when a negative self-image was retrieved.

The findings of this study are consistent with the proposal that self-images may reflect the current working self in Conway and Pleydell-Pearce's (2000) SMS model. According to the model, individuals access different working self-concepts (subsets of the long-term self) in order to achieve their goals in different situations. In this study, the working self-concept was operationalised in terms of self-esteem, self-concept clarity and actual-ideal self-discrepancies and it was hypothesised that asking individuals to retrieve positive or negative self-images would facilitate the retrieval of different working self-concepts. The results of this study support this hypothesis and are consistent with the findings of previous literature (Farrar et al., 2015; Hulme et al., 2012).

The current study also hypothesised that the recurrent negative self-images reported by individuals with eating disorders (Cooper et al., 2007; Hinrichsen et al., 2007) reinforce the unconditional negative beliefs about the self ('core low self-esteem'), which are thought to be, at least in some individuals, central to the maintenance of eating disorder symptomology (Fairburn et al., 2003). The main effect of imagery condition on explicit self-esteem found in this study provides support for this hypothesis. Specifically, this study found that retrieving one negative self-image led to a significant increase in negative state self-esteem and significant decrease in positive state self-esteem. The repeated activation of the negative working self characterised by low self-esteem, is therefore likely to continuously

reinforce pervasive negative views of the self, making it increasingly difficult for individuals to feel confident about their capacity to change and subsequently reducing the likelihood they will fully engage in therapy (Fairburn et al., 2003).

In addition to the above, there are several other routes through which recurrent negative self-images may maintain the negative self-view characteristic of individuals with eating disorders. Firstly, individuals may become trapped in a vicious cycle whereby negative self-images and the negative working self both represent, and start to serve as evidence for, the validity of the other (Hulme et al., 2012). Secondly, in accordance with Brewin's retrieval competition hypothesis (2006), the repeated activation of the self-images may increase the accessibility of these negative self-representations. This could then inhibit the availability of positive self-representations, which could potentially challenge and improve an individual's negative beliefs about the self. Given the detrimental impact of negative self-imagery on the working self-concept found in this study, further research exploring whether negative self-imagery retrieval inhibits access to positive images of the self would further our understanding of the specific role of self-imagery in the maintenance of eating disorders. Additionally, future research utilising the design of the current study with a control group would investigate whether accessing a negative self-image also has detrimental effects on the self-concept of a healthy population. This would provide insight into the role of self-imagery in the development as well as the maintenance of low self-esteem in people with eating disorders.

The results of this study suggest that self-imagery has a greater impact on explicit self-esteem than on implicit self-esteem. The study found no significant difference between the two conditions on levels of implicit self-esteem post-imagery

manipulation. Given that this study involved conscious self-image manipulation it is not surprising that the self-imagery retrieval did not affect the automatic, unconscious self-evaluations known as implicit self-esteem. This finding supports the assertion that implicit self-esteem is relatively stable across time and situations (Greenwald & Banaji, 1995) and is consistent with previous research in this field (e.g., Farrar et al., 2015). One limitation of this study was the absence of a baseline measure of implicit self-esteem. As a result, it was impossible to establish whether implicit self-esteem had changed as a result of the self-imagery manipulations. As well as developing a clearer theoretical understanding of the role of implicit self-esteem in the maintenance of eating disorders, future research could also benefit from directly testing the extent to which implicit attitudes are stable or amenable to change over time. Further research could also investigate whether repeatedly accessing self-images over a longer period of time has an impact on levels of implicit self-esteem. Stopa (2009) asserts that the self is a result of multiple processes which are available through conscious and unconscious awareness. Therefore, if self-images do function within the SMS and are directly able to influence the construction of the self, it is possible that repeatedly accessing self-images may influence implicit as well as explicit self-esteem. Furthermore, there is a need for future research to utilise other measures to assess implicit self-esteem (e.g., the Extrinsic Affective Simon Task (De Houwer, 2003), as repeated administrations of the SE-IAT has been found to decrease the magnitude of the effect (Greenwald et al., 2003).

In addition to the results relating to self-esteem, this study found that positive self-imagery reduced self-concept clarity but negative self-imagery had no impact on this aspect of the self-concept. This result is in contrast to Farrar et al. (2015) who

found that negative self-imagery reduced self-concept clarity and positive self-imagery had no impact on this construct. A number of studies have also found that low self-esteem, compared to high self-esteem, is associated with lower self-concept clarity (Campbell, 1990; Campbell & Fehr, 1990). Therefore, this finding could be viewed as unexpected.

One possible explanation for this result could be related to the proposal that some individuals with eating disorders have 'core low self-esteem' characterised by unconditional and pervasive negative self-beliefs (Fairburn et al., 2003). Retrieving a positive image of the self may have resulted in participants experiencing a more positive working self-concept that is rarely accessible due to the repeated negative self-representations inhibiting the availability of positive self-representations (Brewin, 2006). Experiencing a rare positive working self-concept may have resulted in participants questioning their negative beliefs about the self and having less certainty over their negative self-view. This may have resulted in participants having a less clearly and confidently defined view of the self, explaining the reduction in self-concept clarity.

This finding suggests that positive self-imagery may be effective in creating uncertainty over an individual's negative self-view. This may mean that individuals are more able to access the positive working self-concept which contains information that could potentially improve their overall evaluation of the self and increase the likelihood of recovery. Although lower self-concept clarity is often associated with poorer mental health (Butzer & Kuiper, 2006; Campbell et al., 1996), it is possible that during treatment there is a transitional phase in which self-concept clarity reduces and individuals are able to re-evaluate their unconditional negative view of the self. This may subsequently result in individuals starting to develop a more

positive self-view and could therefore, paradoxically, increase the chance of recovery. To date this hypothesis has not been empirically tested. Future research would therefore benefit from investigating this premise with individuals with eating disorders as well as those with other mental health difficulties. There is also a need for future research to explore the nature of self-concept clarity in people with eating disorders, as no research to date has explored this aspect of the self-concept in this population.

The longstanding negative self-view characteristic of at least some people with eating disorders (Fairburn et al., 2003) may also help explain why negative self-imagery had no impact on state self-concept clarity in the current study. It is possible that accessing a negative self-image clarified the already present negative working self-concept resulting in individuals continuing to have a clear and consistent negative view of the self, and subsequently having no impact on levels of state self-concept clarity. An alternative explanation for this finding could be that the four-item measure of state self-concept clarity used in this study was not sensitive enough to detect change. Utilising a more comprehensive measure (e.g., the me/not me self-description task; Markus, 1977) in future research may demonstrate different results.

Research also suggests that individuals with eating disorders have lower self-esteem and a more pronounced negative self-view than those with high body dissatisfaction (Joiner & Kashubeck, 1996), which is common in the general population (Rodin, Silbersteing & Striegel-Moore, 1985). The participants employed in the study may therefore explain the contrasting findings between this study and the study by Farrar et al. (2015).

Individuals with eating disorders are often found to have actual-ideal self-discrepancies (e.g., Bers et al., 2004). Given that lower self-esteem is associated with

greater actual-ideal self-discrepancies (Higgins, 1989), it makes theoretical sense that the current study found that retrieving a negative self-image, associated with a reduction in explicit self-esteem, increased actual-ideal self-discrepancies and positive self-imagery, associated with an increase in positive self-esteem, decreased such discrepancies. As with the findings regarding explicit self-esteem, the repeated activation of negative self-images found in people with eating disorders (e.g., Hinrichsen et al., 2007), is likely to continuously reinforce the negative self-view and subsequently increase, or at least maintain, the discrepancy between the actual and ideal self. This discrepancy is likely to maintain eating disorders, as individuals will continue to strive to reduce their self-discrepancies by trying to achieve control over their eating, weight and shape. This hypothesis may also explain why individuals with 'core low self-esteem', who are likely to have substantial discrepancies between the actual and ideal self, strive, with particular determination, to achieve their goals in their most valued domain (Fairburn et al., 2003), as they are probably trying exceptionally hard to reduce these self-discrepancies.

This finding may also provide further explanation as to why positive self-imagery resulted in a reduction in self-concept clarity. As individuals with eating disorders are often found to have actual-ideal self-discrepancies (e.g., Bers et al., 2004) and the positive imagery condition reduced this discrepancy, this may have led participants to question how clearly and consistently defined their negative beliefs about the self are, explaining the reduction in state self-concept clarity.

In line with the secondary hypothesis, positive and negative self-imagery impacted on levels of state positive and negative affect. These results suggest that as well as having a detrimental impact on the self-concept; negative self-imagery is also likely to maintain negative affect, which is often associated with low self-esteem in

people with eating disorders. Given that low mood and low self-esteem are highly correlated (Joiner, Katz, & Lew, 1999) and maintain each other (Orth, Robins, & Roberts, 2008; Shahar & Davidson, 2003), it is possible that the recurrent negative self-images experienced in people with eating disorders will strengthen this relationship. It is therefore possible that low mood will contribute to the vicious cycle described earlier in the discussion whereby negative self-images, the negative working self-concept and low mood serve as evidence for the validity for each other.

2.4.1 Clinical Implications

The results of this study have some potentially important clinical implications. The results suggest that utilising techniques that target negative and strengthen positive self-images in clinical practice are likely to improve aspects of the self-concept and affect in individuals with eating disorders. Brewin (2006) asserts that cognitive therapy works by increasing the retrieval of positive self-representations, which, in turn, inhibits the retrieval of and challenges negative self-representations. The study has shown that retrieving an image of the self can be a powerful way to access positive self-representations and suggests that integrating positive self-imagery techniques into eating disorder treatment programmes e.g., CBT for Eating Disorders (CBT-E; Fairburn, 2008), may help challenge the negative sense of self which is one key factor involved in the maintenance of eating disorders (Fairburn et al., 2003). However, this is the first study to investigate the impact of self-imagery in this population. Therefore, future research which seeks to replicate the results of this study and investigate these suggestions, both experimentally and by incorporating self-imagery in treatment trials, would help determine whether

retrieving positive self-images can enhance existing cognitive-behavioural approaches (e.g., Fairburn, 2008).

Previous imagery interventions that have been effective with people with eating disorders include imagery rescripting. Specifically, imagery rescripting has been successful in modifying core beliefs in this population (Cooper, Todd, & Turner, 2007; Ohanian, 2002). This process involves developing and rehearsing a positive image of the self; therefore the mechanism of change described by Brewin (2006) may help explain the positive effects of this technique. If this hypothesis is correct, the positive imagery manipulation described in the current study could be used to complement imagery rescripting protocols and help facilitate change at the core belief level.

Positive self-imagery techniques could also be used alongside verbal techniques commonly used in treatment programmes (e.g., Fairburn, 2008) to address the negative self-concept implicated in the maintenance of eating disorders (Fairburn et al., 2003). Given the content of the negative self-images in this client group, Somerville et al. (2007) proposed that they are equivalent to negative automatic thoughts, which are more commonly researched and thought to play a role in the maintenance of negative self-beliefs and compensatory behaviours (Fairburn et al., 2003). In support of this hypothesis, individuals with eating disorders report experiencing negative self-images associated with looking fat (Cooper et al., 2007) and prior to vomiting (Hinrichsen et al., 2007). The findings in the study suggest that these negative self-images are likely to be associated with low explicit self-esteem, greater actual-ideal self discrepancies and negative affect, which are all likely to contribute to the triggering of negative self-beliefs and vomiting behaviour.

Supporting individuals to access a positive self-image related to a positive working self-concept may therefore help to break this maintenance cycle.

The results of this study provide preliminary support that positive self-imagery interventions have the potential to be effective with individuals with eating disorders. However, further research is needed before firm conclusions can be drawn. Firstly, future research testing this experimental paradigm in a clinical setting is required to examine whether the positive outcomes of self-imagery still apply. Research also needs to be carried out to identify at what stage of treatment positive imagery manipulation could be helpfully employed. Two participants in the positive self-imagery condition were excluded from analysis because they failed to generate an image that was positive enough to meet the manipulation check criteria. However, their results still suggested that the imagery intervention helped them to access a positive working self-concept. This highlights the need for future research to investigate the factors that produce a positive effect in the imagery intervention. Specifically, researchers need to consider how positive the image needs to be to elicit a positive working self-concept and whether the vividness of the self-image influences effectiveness. This information would inform clinicians as to whether it would be beneficial to practice retrieving self-images with clients before utilising this technique. This study investigated the effects of accessing a positive self-image associated with the whole self, indicating that supporting individuals to access any positive image of the self that is rooted in actual experience has the potential to have positive outcomes on the self-concept and affect. Future research which replicates and expands the current study, perhaps by assessing the impact of self-imagery on other aspects of the self-concept e.g., self-affirmation, would further our understanding of the impact of self-imagery on the self-concept in eating disorders.

It would also be beneficial to investigate the effectiveness of this technique in improving self-esteem, self-concept clarity, self-discrepancies and affect compared to traditional verbal techniques used in CBT-E, to help determine whether it could enhance evidence-based approaches.

2.4.2 Limitations

Inevitably this study has a number of limitations. The study adverts and EDE-Q used to recruit individuals with, or at risk of, eating disorders means it is possible that participants were not completely blind to the topic of the study. The use of a pre-post design may have also provided participants with information about the aims of the study. Therefore, it is possible that some of the results could be affected by demand characteristics. Furthermore, participants in the study may have been in treatment for disordered eating which may have impacted on the results. As mentioned earlier, there was no baseline measure of implicit self-esteem. Consequently, it is unclear whether participants in the two self-imagery conditions had comparable levels of implicit self-esteem at the start of the study and whether the imagery manipulation affected this construct. Despite the SE-IAT being the most widely used measure of implicit self-esteem (Cardi et al., 2014), its validity in measuring automatic evaluations and implicit self-esteem has been criticised. Specifically, Rothermund and Wentura (2004) argue that the SE-IAT may measure salience of concepts rather than associations. They suggest that faster response times when pairing concepts on the SE-IAT indicate that concepts are similar in salience as opposed to being indicative of stronger associations (as proposed by Greenwald & Farnham, 2000). The results of the SE-IAT as a measure of implicit self-esteem therefore need to be interpreted with caution. Finally, this study only collected data

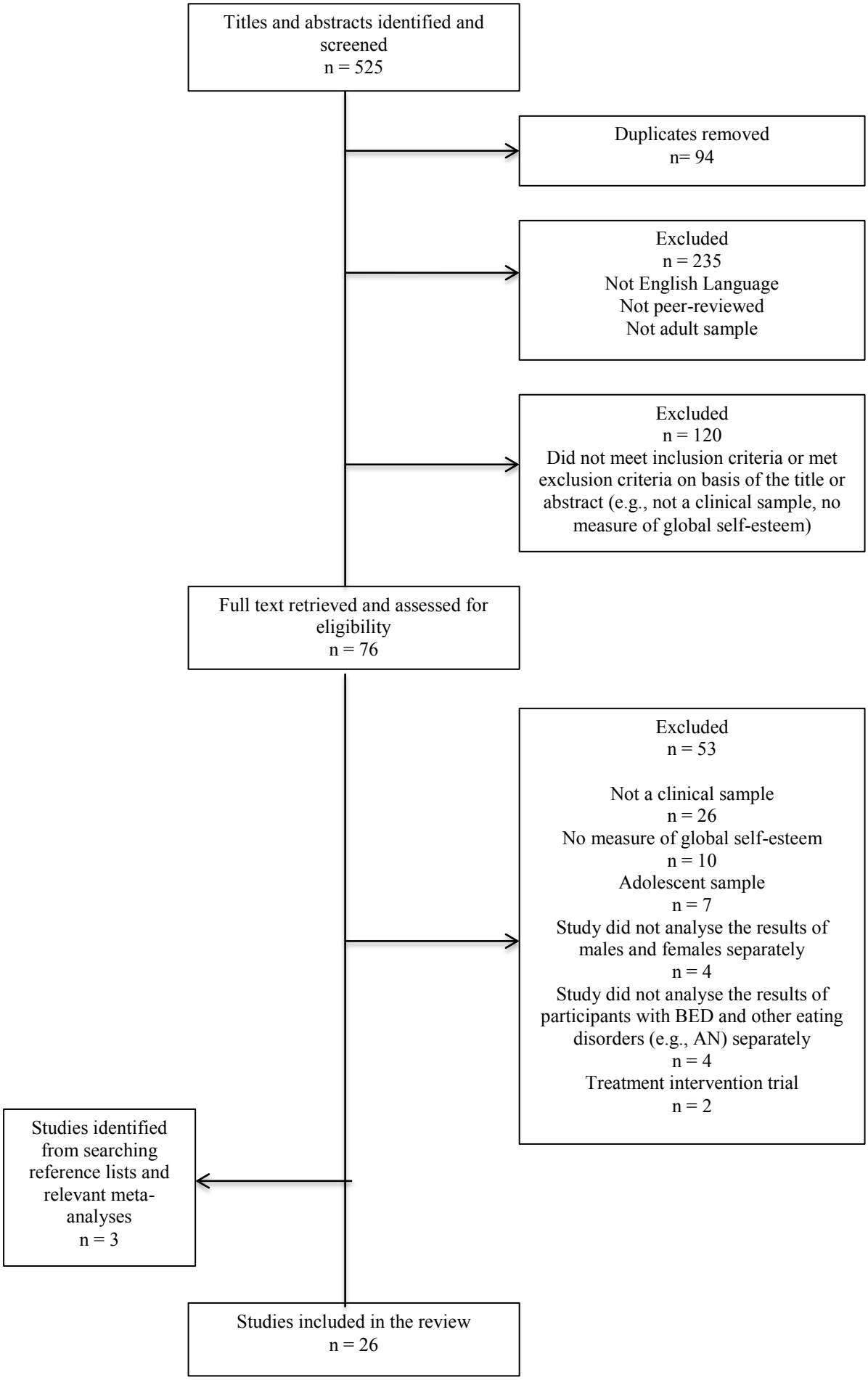
at two time points, immediately before and after the imagery manipulation. Therefore, we do not know if the beneficial effects of accessing a positive self-image were maintained. Future research, which involves collecting regular follow-up data, would help determine the effectiveness of this intervention over time. Further studies investigating the effect of repeatedly accessing a positive self-image on aspects of the self-concept over time, would help us gain insight into whether this technique has more clinical utility than the approach used in the current study.

2.5 Conclusion

The present study suggests that individuals with, or at risk of developing, eating disorders are able to access a positive image of the whole self, and these images are associated with an improved positive working self-concept characterised by improvements in explicit self-esteem, and a reduction in self-concept clarity and actual-ideal self-discrepancies. In comparison, and with the exception of self-concept clarity, negative self-imagery retrieval was associated with a more negative working self-concept in this population. Self-imagery retrieval was also associated with changes in affect. Although these results need replicating, they suggest that negative self-imagery may play an important role in the maintenance of 'core low self-esteem' and eating disorder symptomology. They also suggest that the integration of techniques which support the retrieval of positive self-images into current treatment approaches, may help reduce the negative self-view characteristic of individuals with eating disorders.

Appendices

Appendix A: Flow Chart Detailing the Systematic Study Selection Process used in the Literature Review


Titles and abstracts identified and screened
n = 525
Duplicates removed
n= 94
Excluded
n = 235
Not English Language
Not peer-reviewed
Not adult sample
Excluded
n = 120
Did not meet inclusion criteria or met exclusion criteria on basis of the title or abstract (e.g., not a clinical sample, no measure of global self-esteem)
Full text retrieved and assessed for eligibility
n = 76
Excluded
n = 53
Not a clinical sample
n = 26
No measure of global self-esteem
n = 10
Adolescent sample
n = 7
Study did not analyse the results of males and females separately
n = 4
Study did not analyse the results of participants with BED and other eating disorders (e.g., AN) separately
n = 4
Treatment intervention trial
n = 2
Studies identified from searching reference lists and relevant meta-analyses
n = 3
Studies included in the review
n = 26

Appendix B: Study Adverts

Psychobook Advert

The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight

I am recruiting female volunteers aged between 18 and 65 years who are students or members of staff at the University of Southampton, who have concerns about their eating, shape or weight to take part in my research study investigating how mental images of ourselves impact on how we feel about ourselves.

Participation involves you first completing an online questionnaire. This should take no longer than 15 minutes. If you score within the range we are interested in you will be emailed by the researcher and invited to meet them for a single two hour session at the university. A convenient date and time to meet will be agreed between the participant and researcher. During the session you will be supported to remember an image of yourself and will be asked questions about how you feel about yourself whilst holding the image in mind. You will be asked to complete some questionnaires before and after you have remembered the image. Following this you will be asked to complete a word search. You will then be invited to answer some questions about your eating and how you feel about your weight and shape. Finally, the researcher will ask to measure your height and weight.

Participants will receive either course credits or cash payment for taking part in the study. One credit/£1.50 will be given after the completion of the online questionnaire and you will receive this even if you are not invited to take part in the second stage of the study. Participants who take part in the second stage of the study will receive 8 credits/£12 for completing the two hour session.

To take part in the first stage (online questionnaire) please click the link below:

https://www.isurvey.soton.ac.uk/12547

If you would like further information please contact Jodie Harlowe (jch1g12@soton.ac.uk) to request a copy of the information sheet.

UNIVERSITY OF Southampton

THE IMPACT OF SELF-IMAGERY ON SENSE OF SELF IN INDIVIDUALS WHO HAVE CONCERNS ABOUT THEIR EATING, SHAPE OR WEIGHT

Are you female and aged between 18-65?

Are you a student or member of staff at the University of Southampton?

If so, I am interested in hearing from you.

I am recruiting volunteers who have concerns about their eating, body shape or weight to take part in my research study investigating how mental images of ourselves impact on how we feel about ourselves.

Participation involves you first completing an online questionnaire. This should take no longer than 15 minutes. If you score within the range we are interested in you will be emailed by the researcher and invited to meet them for a single two hour session at the university. During the session you will be supported to remember an image of yourself and will be asked questions about how you feel about yourself whilst holding the image in mind. You will be asked to complete some questionnaires before and after you have remembered the image. Following this you will be asked to complete a word search. You will then be invited to answer some questions about your eating and how you feel about your weight and shape. Finally, the researcher will ask to measure your height and weight.

PAYMENT: You will receive either course credits or cash payment for taking part.

1 credit/£1.50 will be given after the completion of the online questionnaire

Participants invited to take part in the second stage will receive an additional **8 credits/£12** for completing the 2 hour session.

To complete the first stage (online questionnaire) please type in the following web address (also on the tear off slips below): **https://www.isurvey.soton.ac.uk/12547**
Or contact me on jch1g12@soton.ac.uk and I can forward you the link.
If you would like further information please contact Jodie Harlowe (jch1g12@soton.ac.uk) to request a copy of the information sheet.

Part 1: https://www.isurvey.soton.ac.uk/12547
Email: jch1g12@soton.ac.uk

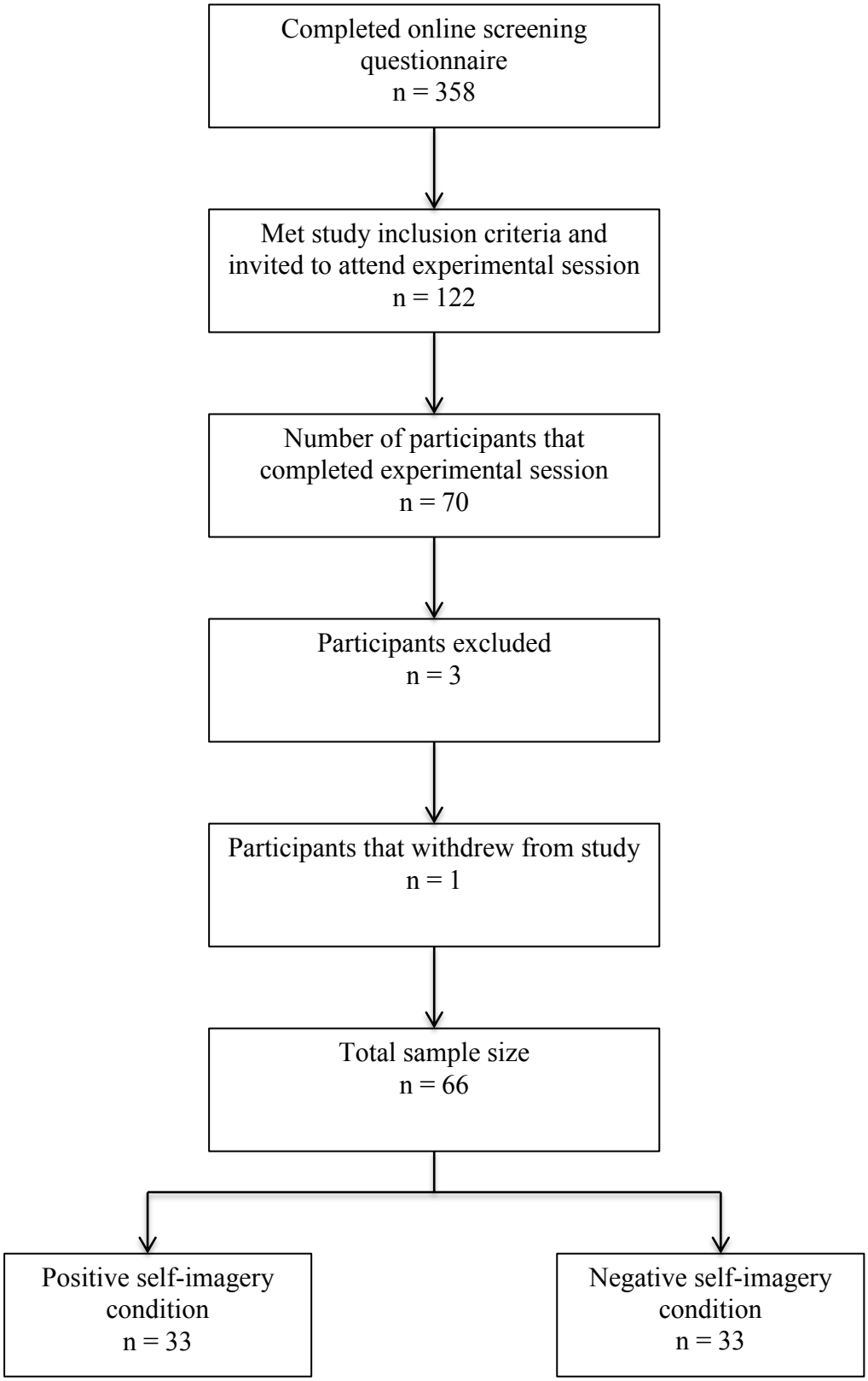
Part 1: https://www.isurvey.soton.ac.uk/12547
Email: jch1g12@soton.ac.uk

Part 1: https://www.isurvey.soton.ac.uk/12547
Email: jch1g12@soton.ac.uk

Part 1: https://www.isurvey.soton.ac.uk/12547
Email: jch1g12@soton.ac.uk

Part 1: https://www.isurvey.soton.ac.uk/12547
Email: jch1g12@soton.ac.uk

Appendix C: Flow Chart Detailing the Recruitment Process for the Empirical Study


Completed online screening questionnaire
n = 358
Met study inclusion criteria and invited to attend experimental session
n = 122
Number of participants that completed experimental session
n = 70
Participants excluded
n = 3
Participants that withdrew from study
n = 1
Total sample size
n = 66
Positive self-imagery condition
n = 33
Negative self-imagery condition
n = 33

Appendix D: State Self-Esteem Scale (SSES; McFarland & Ross, 1982)

State Self-Esteem Scale

For each of the items, please circle the number on the scale that best represents how you feel right now.

1. Pride

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

2. Inadequate

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

3. Competent

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

4. Confident

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

5. Incompetent

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

6. Stupid

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

7. Worthless

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

8. Smart

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

9. Resourceful

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

10. Effective

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

11. Ashamed

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

12. Efficient

1 2 3 4 5 6 7 8 9 10 11
Not at All Extremely

Appendix E: State Self-Concept Clarity Scale (SSCCS; Nezlek & Plesko, 2001)

State Self-Concept Clarity Scale

For each of the following statements, please indicate the extent to which the statement applies to you RIGHT NOW. Use the scale provided.

1. **My beliefs about myself often conflict with one another.**

   1----------2----------3----------4----------5
   Strongly Disagree — Strongly Agree

2. **My beliefs about myself seem to change very frequently.**

   1----------2----------3----------4----------5
   Strongly Disagree — Strongly Agree

3. **If I were asked to describe my personality, my description might end up being different from one day to another day.**

   1----------2----------3----------4----------5
   Strongly Disagree — Strongly Agree

4. **Sometimes I feel that I am not really the person that I appear to be.**

   1----------2----------3----------4----------5
   Strongly Disagree — Strongly Agree

Appendix F: Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988)

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate number next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale provided to record your answers.

1 = very slightly or not at all
2 = a little
3 = moderately
4 = quite a bit
5 = extremely

1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Appendix G: Positive Self-Imagery Interview Script

Positive Self-Imagery Interview

Participant Number _____

I would like you to think of a time when you have felt positive about yourself. You may have felt happy, confident, relaxed or similar.

Often when people feel happy, confident or relaxed they feel good about themselves and may have a positive image of themselves in their mind. I'm going to try to help you get hold of the image and the general sense of yourself you have when you are feeling good about yourself.

Please can you take a few minutes to think of a time when you felt good about yourself?

Pause

Have you been able to think of a time when you felt good about yourself?

Yes/no.

-If the participant says no say,

-Try to keep thinking, it could be any situation where you have felt good about yourself.

-Pause and ask,

-Have you been able to think of a time you felt positive about yourself?

Now, in your mind, I would like you to try to recreate that situation and the image you have of yourself as vividly as possible. You may wish to close your eyes.

Pause

I am now going to ask you some questions…

What is happening in the image you can see right now? Please describe it to me.

Prompts:-

Where are you?

What are you doing?

Who are you with?

How do you see yourself in the image?

What do you look like in the image?

-Summarise and check if each part is right.
-Ask for more details if the participant is brief.

I would like you to stay focusing on that situation, try to get a clear image or sense of what it was like.

Pause

How does the image make you feel about yourself?

Do you have a positive sense of yourself in the situation?
-Yes/no
-If no identify another situation.

As you think about that situation now, do you have any sensations in your body?

Summarise the setting and image.

As you continue to hold the image of yourself in your mind, how positive is your view of yourself on a scale of 0 to 100, where 0 represents not at all positive and 100 represents feeling extremely positive about yourself. (Manipulation check question).
-If the participants response is not 60 or above choose another situation.

As you hold the image in mind, how vivid is the image/sense of yourself on a scale of 0-100, with 0 representing not at all vivid/strong and 100 representing extremely vivid/strong? (Manipulation check question).
-If the participants response is not 60 or above ask for more details about the situation and then repeat the question.

What emotions do you feel now as you hold the image in mind?

Can you rate how strong that emotion is on a scale of 0 to 100, with 0 representing not at all strong and 100 representing extremely strong.

Do you feel any other emotions right now as you hold the image in mind?
-Rate each emotion using the scale above.

Keeping the image of yourself in mind can you tell me how you feel about yourself in this present moment?

I am now going to summarise what you have described to me and after I want you to let me know if I have captured the image correctly.

Confirm whether I have captured the image correctly.

Ok, now I want you to hold the image in mind whilst you complete the questionnaires again. Please open your eyes.

Give the participant the questionnaires to complete. Once the participant has completed the questionnaires say,

What percentage of time were you able to hold the image you had of yourself in mind whilst you completed the paper-based questionnaires, with 0% representing none of the time and 100% representing all of the time? (Manipulation check question).

What percentage of time were you able to hold the image you had of yourself in mind whilst you completed the computer programme, with 0% representing none of the time and 100% representing all of the time? (Manipulation check question).

Appendix H: Negative Self-Imagery Interview Script

Negative Self-Imagery Interview

Participant Number _____

I would like you to think of a time when you have felt negative about yourself. You may have felt sad, upset, lacked confidence, stressed out or similar.

Often when people feel sad, upset or stressed out they feel negative about themselves and may have a negative image of themselves in their mind. I'm going to try to help you get hold of the image and the general sense of yourself you have when you are feeling negative about yourself.

Please can you take a few minutes to think of a time when you felt negative about yourself?

Pause

Have you been able to think of a time you felt negative about yourself?

Yes/no

-*If the participant says no say,*

-Try to keep thinking, it could be any situation where you have felt negative about yourself.

-*Pause and ask,*

-Have you been able to think of a time you felt negative about yourself?

Now, in your mind, I would like you to try to recreate that situation and the image you have of yourself as vividly as possible. You may wish to close your eyes.

Pause

I am now going to ask you some questions…

What is happening in the image you can see right now? Please describe it to me.

Prompts:-

Where are you?

What are you doing?

Who are you with?

How do you see yourself in the image?

What do you look like in the image?

-Summarise and check if each part is right.
-Ask for more details if the participant is brief.

I would like you to stay focusing on that situation, try to get a clear image or sense of what it was like.

Pause

How does the image make you feel about yourself?

Do you have a negative sense of yourself in the situation?
-Yes/no
-If no identify another situation.

As you think about the situation now, do you have any sensations in your body?

Summarise the setting and image.

As you continue to hold the image of yourself in your mind, how negative is your view of yourself on a scale of 0 to 100, where 0 represents not at all negative and 100 represents feeling extremely negative about yourself? (Manipulation check question).
-If the participants response is not 60 or above choose another situation.

As you hold the image in mind, how vivid is the image/sense of yourself on a scale of 0-100, with 0 representing not at all vivid/strong and 100 representing extremely vivid/strong? (Manipulation check question).
-If the participants response is not 60 or above ask for more details about the situation and then repeat the question.

What emotions do you feel now as you hold the image in mind?

Can you rate how strong that emotion is on a scale of 0 to 100, with 0 representing not at all strong and 100 representing extremely strong.

Do you feel any other emotions right now as you hold the image in mind?
-Rate each emotion using the scale above.

Keeping the image of yourself in mind can you tell me how you feel about yourself in this present moment?

I am now going to summarise what you have described to me and after I want you to let me know if I have captured the image correctly.

Confirm whether I have captured the image correctly.

Ok, now I want you to hold the image in mind whilst you complete the questionnaires again. Please open your eyes.

Give the participant the questionnaires to complete. Once the participant has completed the questionnaires say,

What percentage of time were you able to hold the image you had of yourself in mind whilst you completed the paper-based questionnaires, with 0% representing none of the time and 100% representing all of the time? (Manipulation check question).

What percentage of time were you able to hold the image you had of yourself in mind whilst you completed the computer programme, with 0% representing none of the time and 100% representing all of the time? (Manipulation check question).

Appendix I: Participant Information Sheet provided when the EDE was Audio-Recorded

UNIVERSITY OF Southampton

Participant Information Sheet
(Version 1, 29.06.14)

Study title: The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight.

Researcher: Jodie Harlowe (Trainee Clinical Psychologist)

ERGO Study ID number: 9212

You are being invited to take part in a research study at The University of Southampton. Before deciding whether to take part it is important that you understand why the study is being carried out and what it will entail.

Please read this information carefully, it will explain what the study is about and what you will be asked to do if you decide to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?
The study aims to investigate how mental images of ourselves impact on our sense of self (how we feel about ourselves) in individuals who report concerns about their eating, body shape or weight. This topic is a relatively new area of research and therefore, it is hoped that the findings of this study will develop current psychological theory and inform future interventions for clinical populations.

Why have I been chosen?
You have been invited to take part in this research because you scored within the range we are interested in on the online questionnaire.

What will happen to me if I take part?
If you agree to take part in this study it will take approximately two hours. Initially, you will be asked to complete five paper-based questionnaires and a demographic information sheet which asks for your age. You will then take part in an imagery based intervention. This will involve the researcher supporting you to remember an image of yourself and asking you some questions about this image and the views you hold about yourself whilst holding the image in mind. This part of the study will be audio-recorded for quality control purposes. You will then be asked to complete four of the same questionnaires you completed prior to the imagery intervention and a computer-based task. You will then be offered a break and asked to complete a word search. Following this the researcher will carry out an interview and you will be asked numerous questions about your eating and how you feel about your weight and shape. This part of the study will also be audio-recorded for quality control purposes. The researcher will then ask to measure your height and weight. Finally, you will be fully debriefed by the researcher and have an opportunity to ask any questions you may have.

Are there any benefits to me taking part?
There are no personal benefits to you taking part in this study. However, this research hopes to improve our understanding of the impact self-imagery has on how people feel about themselves. It is also hoped that the findings of this study will inform the development of psychological interventions for clinical populations.

Will I receive payment?
You will receive the advertised credits/payment for completing this study. If you decide not to complete all of the study, you will still receive credits/payment for the parts you completed.

Are there any risks involved?
There are no foreseeable risks involved in taking part in this study. However, if you feel upset after remembering an image of yourself, answering questionnaires about how you feel about yourself or talking about your eating behaviours, weight and shape, the researcher will be available to talk to you at the end of the session. The debrief information will also contain details of how to access further support if you have any concerns about your self-esteem, body shape or weight.

Will my participation be confidential?
The study is carried out in accordance with the Data Protection Act. Therefore, any written reporting of the findings will not include your name or any other identifying characteristics. The questionnaires you complete will be anonymous and be stored in a locked cabinet. You will be assigned an individual numerical ID code when data is entered into the computer database, this will ensure confidentially and the database will be kept on a password protected computer.

What happens if I change my mind?
Your participation in this research is entirely voluntary and you may withdraw your data from the study without giving any reason at any time, without your legal rights being affected. There will be no consequences for withdrawing your data and you will still receive the credits/money you earned.

What happens if something goes wrong?
If you have any concerns about your rights as a participant in this study or if you feel you have been placed at risk, please contact:

Chair of the Ethics Committee
Department of Psychology
University of Southampton
Southampton
SO17 1BJ
Email: slbn12@soton.ac.uk
Tel No: 023 8059 4663

Where can I get more information?
If you have any further questions about this study please contact Jodie Harlowe (Trainee Clinical Psychologist) at jch1g12@soton.ac.uk.

Thank you for reading the above information.
If you are willing to participate in this study please complete and sign the consent form.

Appendix J: Participant Information Sheet provided when the EDE was not Audio-Recorded

UNIVERSITY OF Southampton

Participant Information Sheet
(Version 1, 28.06.14)

Study title: The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight.

Researcher: Jodie Harlowe (Trainee Clinical Psychologist)

ERGO Study ID number: 9212

You are being invited to take part in a research study at The University of Southampton. Before deciding whether to take part it is important that you understand why the study is being carried out and what it will entail.

Please read this information carefully, it will explain what the study is about and what you will be asked to do if you decide to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?
The study aims to investigate how mental images of ourselves impact on our sense of self (how we feel about ourselves) in individuals who report concerns about their eating, body shape or weight. This topic is a relatively new area of research and therefore, it is hoped that the findings of this study will develop current psychological theory and inform future interventions for clinical populations.

Why have I been chosen?
You have been invited to take part in this research because you scored within the range we are interested in on the online questionnaire.

What will happen to me if I take part?
If you agree to take part in this study it will take approximately two hours. Initially, you will be asked to complete five paper-based questionnaires and a demographic information sheet which asks for your age. You will then take part in an imagery based intervention. This will involve the researcher supporting you to remember an image of yourself and asking you some questions about this image and the views you hold about yourself whilst holding the image in mind. This part of the study will be audio-recorded for quality control purposes. You will then be asked to complete four of the same questionnaires you completed prior to the imagery intervention and a computer-based task. You will then be offered a break and asked to complete a word search. Following this the researcher will carry out an interview and you will be asked numerous questions about your eating and how you feel about your weight and shape. The researcher will then ask to measure your height and weight. Finally, you will be fully debriefed by the researcher and have an opportunity to ask any questions you may have.

Are there any benefits to me taking part?
There are no personal benefits to you taking part in this study. However, this research hopes to improve our understanding of the impact self-imagery has on how people feel about themselves. It is also hoped that the findings of this study will inform the development of psychological interventions for clinical populations.

Will I receive payment?
You will receive the advertised credits/payment for completing this study. If you decide not to complete all of the study, you will still receive credits/payment for the parts you completed.

Are there any risks involved?
There are no foreseeable risks involved in taking part in this study. However, if you feel upset after remembering an image of yourself, answering questionnaires about how you feel about yourself or talking about your eating behaviours, weight and shape, the researcher will be available to talk to you at the end of the session. The debrief information will also contain details of how to access further support if you have any concerns about your self-esteem, body shape or weight.

Will my participation be confidential?
The study is carried out in accordance with the Data Protection Act. Therefore, any written reporting of the findings will not include your name or any other identifying characteristics. The questionnaires you complete will be anonymous and be stored in a locked cabinet. You will be assigned an individual numerical ID code when data is entered into the computer database, this will ensure confidentially and the database will be kept on a password protected computer.

What happens if I change my mind?
Your participation in this research is entirely voluntary and you may withdraw your data from the study without giving any reason at any time, without your legal rights being affected. There will be no consequences for withdrawing your data and you will still receive the credits/money you earned.

What happens if something goes wrong?
If you have any concerns about your rights as a participant in this study or if you feel you have been placed at risk, please contact:

Chair of the Ethics Committee
Department of Psychology
University of Southampton
Southampton
SO17 1BJ
Email: slbn12@soton.ac.uk
Tel No: 023 8059 4663

Where can I get more information?
If you have any further questions about this study please contact Jodie Harlowe (Trainee Clinical Psychologist) at jch1g12@soton.ac.uk.

Thank you for reading the above information.
If you are willing to participate in this study please complete and sign the consent form.

Appendix K: Consent Form used when the EDE was Audio-Recorded

UNIVERSITY OF Southampton

CONSENT FORM (Version 1, 29.06.14)

Study title: The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight.

Researcher name: Jodie Harlowe (Trainee Clinical Psychologist)

Ethics reference: 9212

Please initial the box(es) if you agree with the statement(s):

I have read and understood the participant information sheet (29.06.14/Version 1) for the above study. I have had the opportunity to consider the information and ask questions about the study.	☐
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	☐
I understand my participation is entirely voluntary and I may withdraw at any time without giving any reason, without any consequence.	☐
I agree for the imagery interview and semi-structured interview asking about my eating behaviours and how I feel about my weight and shape to be audio recorded for the purpose of this study.	☐

Name of participant (print name)……

Signature of participant……..

Date……

Appendix L: Consent Form used when the EDE was not Audio-Recorded

UNIVERSITY OF Southampton

CONSENT FORM (Version 1, 28.06.14)

Study title: The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight.

Researcher name: Jodie Harlowe (Trainee Clinical Psychologist)

Ethics reference: 9212

Please initial the box(es) if you agree with the statement(s):

I have read and understood the participant information sheet (28.06.14/Version 1) for the above study. I have had the opportunity to consider the information and ask questions about the study.	☐
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	☐
I understand my participation is entirely voluntary and I may withdraw at any time without giving any reason, without any consequence.	☐
I agree for the imagery interview to be audio recorded for the purpose of this study.	☐

Name of participant (print name)……

Signature of participant……..

Date……

Appendix M: Word Search

SUMMER WORD SEARCH

P O P S I C L E A X N I P C D
I T E B W E E T G J O I D X U
C N N J W I K U A U L C B W O
N B G L I I M V T L E E A T S
I U C B G J H S A Y M C R E T
C E F E I P I B U R R R B X R
Z U G A R D E N T I E E E T A
I K E C E S U N O I T A C A V
X Z L H A U G U S T A M U O E
S X S B Y M K O O R W K E Y L
E M F D I F P R D A V I Y S R
M N Y N R F M I E T E M K L L
S U F P B N U O N I O P L I D
H H J M Y H O K W G R H C W K
L U B K G O T S J E C G F K N

AUGUST
BARBECUE
BASEBALL
BEACH
CAMPING
GARDEN
HOT DOGS
ICE CREAM
JULY
OUTSIDE
PICNIC
POPSICLE
SUN
SWIMSUIT
TRAVEL
VACATION
WATERMELON

Appendix N: Debrief Statement

UNIVERSITY OF Southampton

Debrief Statement (Version 1, 16.02.14)

The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight

Thank you for participating in this research study.

The aim of the study was to investigate the impact self-imagery has on sense of self (how we feel about ourselves) in individuals who report concerns about their eating, body shape or weight. We were particularly interested in whether remembering positive or negative images of the self influences how individuals feel about themselves.

Based on the results of previous research we expect to find that compared to pre-imagery intervention questionnaire scores individuals who remember a positive image of themselves will report higher self-esteem and improved positive mood after the imagery intervention. In comparison, we expect to find that individuals who remember a negative image of themselves will report lower self-esteem and a reduction in positive mood following the imagery intervention. We anticipate these findings because the results of previous research studies have shown that accessing a positive image of oneself activates a positive working self (a positive view of oneself and positive beliefs about the self). Activation of the positive working self also decreases the accessibility of the negative working self (i.e., negative beliefs about the self) meaning the positive working self is more likely to be retrieved. Your data will provide us with information that will further inform our understanding of the impact of self-imagery on sense of self in individuals who report concerns about their eating behaviours, body shape or weight. We hope that the results of this study will also inform future psychological interventions for clinical populations. If you are interested in this area of research and are keen to read more about the previous studies conducted, please see the references at the end of this statement.

Once again, I would like to assure you that the results of this study will not include your name or any other identifying characteristics and that this study did not use any form of deception.

If you have any worries about your self-esteem, mood, eating, body shape or weight that are causing you distress, please contact your GP or any of the services detailed below for support.

If you have any concerns about your mood or self-esteem please contact:
Steps 2 Wellbeing on 0800 612 7000 or visit http://www.steps2wellbeing.co.uk/ for further information. Steps 2 wellbeing is a free, confidential NHS service for people aged 18 years and over. The service offers a range of different types of treatment for people experiencing problems with low mood/depression, anxiety or stress and you are able to self-refer to the service.

If you have any concerns about your eating, body shape or weight please contact your GP to discuss a potential referral to your local Eating Disorders Service:

April House
9 Bath Road
Bitterne
Southampton
SO19 5ES
Tel No.: 023 8081 9000

April House is an eating disorders service which provides support to individuals over 18 who have concerns about their eating, weight and shape. I have attached April House's leaflet to this statement which provides further information and details on how to access the service.

Furthermore, the beat website (b-eat.co.uk) is an extremely good resource for people who have concerns related to eating disorders. It provides details of helplines individuals can contact as well as online support and self-help groups to support adults to overcome their difficulties.

If you have any further questions or would like to see a summary of the results please contact Jodie Harlowe (Trainee Clinical Psychologist): jch1g12@soton.ac.uk. If you would like to see a copy of the final report this will be available from August 2015.

If you have any concerns about your rights as a participant in this research, or if you feel you have been placed at risk, please contact the Chair of the Ethics Committee at The University of Southampton:

Chair of the Ethics Committee
Department of Psychology
University of Southampton
Southampton
SO17 1BJ
Email: slbn12@soton.ac.uk
Tel No: 023 8059 4663

Thank you again for your participation in this study.

Jodie Harlowe

Further reading:

Cooper, M. J. (2009). Imagery and the negative self in eating disorders. In L. Stopa (Ed.), *Imagery and the threatened self: Perspectives on mental imagery and the self in cognitive therapy* (pp. 181-205). New York, NY: Routledge.

Hulme, N., Hirsch, C., & Stopa, L. (2011). Images of the self and self-esteem: Do positive self-images improve self-esteem in social anxiety? *Cognitive Behaviour Therapy, 41*(2), 163-173. doi:10.1080/16506073.2012.664557

Appendix O: Calm Scene Imagery Script

Calm and Safe Scene Imagery Script

Imagine a place where you feel calm and safe. Somewhere you feel secure and comfortable. It may be a place you have been before, somewhere you would like to go or a safe, peaceful place you can imagine in your mind. You may imagine a beach, a rainforest, a boat or anywhere you find safe and relaxing.

Can you imagine somewhere like that?

Now sit comfortably and take a breath. If you would like, you can close your eyes.

Imagine you are really there and look around the safe, calm scene.

Where are you? What can you see?

Notice the colours and the details of the surroundings.

Notice what you can hear, the sounds around you or perhaps the silence. What can you hear close by? What can you hear far away?

Take a moment to smell your surroundings.

Now focus on your skin, what can you feel? It may be the ground beneath you, the temperature, the air or anything else you can touch.

Imagine feeling calm and relaxed, enjoy being in this pleasant place.

As you relax imagine any tension leaving your body and feeling safe, secure, comfortable and peaceful.

Now take a moment to enjoy the calmness and safety of the scene and the feeling of relaxation.

When you are ready, open your eyes. Become aware of where you are now and bring yourself back to the ‘here and now’.

Appendix P: Ethical Approval Confirmation

Submission Number: 9212
Submission Name: The impact of self-imagery on sense of self in individuals who have concerns about their eating, shape or weight.
This is email is to let you know your submission was approved by the Ethics Committee.

You can begin your research unless you are still awaiting specific Health and Safety approval (e.g. for a Genetic or Biological Materials Risk Assessment)

Comments
None
Click here to view your submission

ERGO : Ethics and Research Governance Online
http://www.ergo.soton.ac.uk

DO NOT REPLY TO THIS EMAIL

Appendix Q: Results from the Eating Disordered Sample

The eating disordered sample consisted of participants who met diagnostic criteria for an eating disorder and those categorised as having a subclinical eating disorder. The results from this sample are presented below.

Table 7 shows the mean scores and standard deviations for the measures administered to the eating disordered sample at baseline and post manipulation for the two imagery conditions.

Table 7

Mean Scores and Standard Deviations (in parenthesis) for all the Measures administered at Baseline and Post Manipulation for each Self-Imagery Condition in the Eating Disordered Sample

	Positive Self-Imagery Condition (n = 16)		Negative Self-Imagery Condition (n = 14)	
Measure	Baseline	Post	Baseline	Post
RSE	16.88 (4.22)		14.07 (4.03)	
State Positive Self-Esteem	45.56 (11.33)	51.44 (16.81)	37.57 (9.05)	25.29 (8.84)
State Negative Self-Esteem	22.50 (7.72)	13.31 (8.28)	25.36 (8.22)	37.29 (7.03)
State Self-Concept Clarity	13.13 (3.98)	10.88 (4.99)	15.43 (2.47)	15.79 (2.29)
State Self Discrepancy	19.54 (4.00)	13.38 (7.27)	20.85 (1.46)	29.83 (3.49)
State Positive Affect	30.06 (8.81)	34.75 (10.81)	24.79 (7.45)	17.86 (6.19)
State Negative Affect	17.25 (5.70)	15.18 (6.34)	19.35 (6.69)	27.21 (7.57)
IAT D Effect Score		-0.05 (0.85)		0.15 (0.63)

Self-Concept Measures

Explicit state positive self-esteem. There was a significant main effect of condition, $F(1, 28) = 17.52$, $p < .001$, partial $\eta^2 = .39$, no effect of time, $F(1,28) = 3.34$, $p = .08$, partial $\eta^2 = .11$, but a significant interaction between time and condition, $F(1,28) = 26.78$, $p < .001$, partial $\eta^2 = .49$. Figure 7 illustrates the interaction. Post hoc analysis indicated that there was no significant difference between pre and post positive self-esteem scores in the positive condition, $t(15) = -2.06$, $p = .06$, $r = .47$. However, positive self-esteem significantly decreased post-imagery manipulation in the negative condition, $t(13) = 6.61$, $p < .001$, $r = .88$. The positive imagery condition also reported significantly higher levels of positive self-esteem after the imagery manipulation compared to the negative condition, $t(23.29) = 5.43$, $p < .001$, $r = .75$.

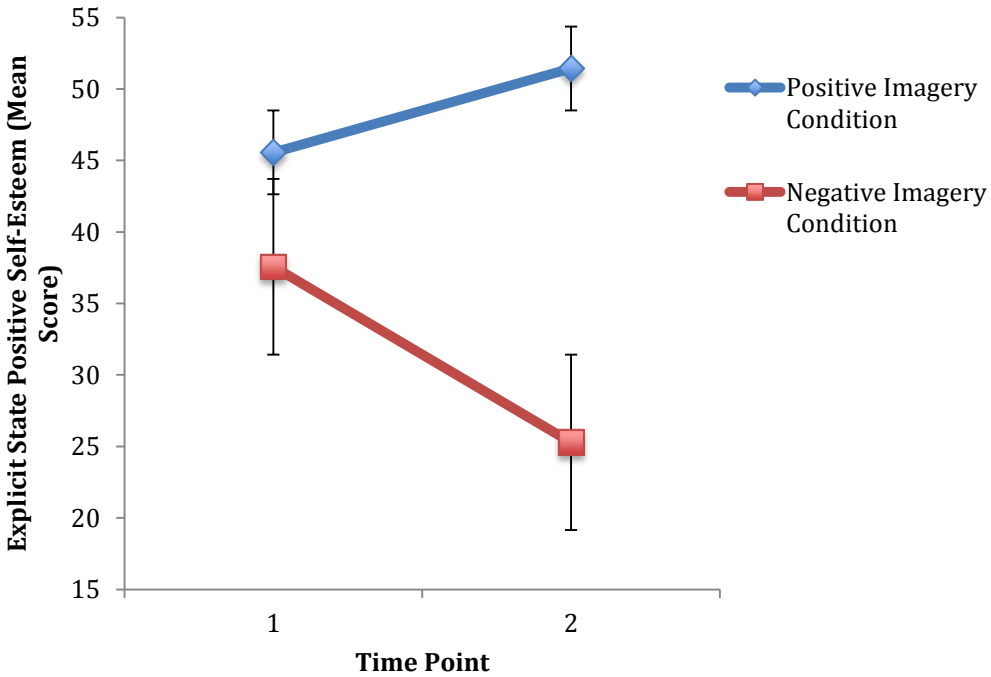


Figure 7. Mean (standard error) pre and post explicit state positive self-esteem scores for the positive and negative self-imagery conditions in the eating disordered sample.

Explicit state negative self-esteem. There as a significant main effect of condition, $F(1,28) = 27.51$, $p < .001$, partial $\eta^2 = .50$, no effect of time, $F(1,28) = 1.11$, $p = .30$, partial $\eta^2 = .04$, but a significant interaction between time and condition, $F(1,28) = 65.68$, $p < .001$, partial $\eta^2 = .70$. Figure 8 illustrates the interaction. Post hoc analysis indicated that negative self-esteem significantly increased in the negative condition after the imagery manipulation, $t(13) = -5.99$, $p < .001$, $r = .86$, whereas it significantly decreased post-imagery manipulation in the positive condition, $t(15) = 5.39$, $p < .001$, $r = .81$. The negative condition also reported significantly higher levels of negative self-esteem after the imagery manipulation compared to the positive condition, $t(28) = -8.48$, $p < .001$, $r = .85$.

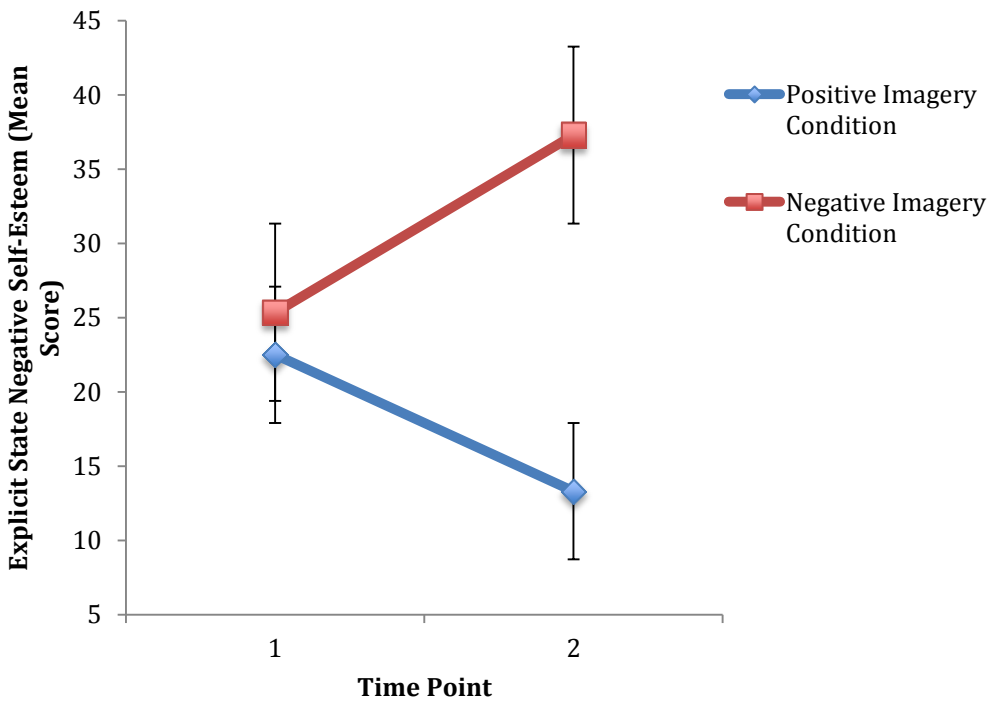


Figure 8. Mean (standard error) pre and post explicit state negative self-esteem scores for the positive and negative self-imagery conditions in the eating disordered sample.

Implicit self-esteem. There was no significant difference between the positive (*Mdn* = -.41) and negative (*Mdn* = .32) imagery condition on levels of implicit self-esteem after the imagery manipulation, $U = 93.00$, $z = -.79$, $p = .43$.

State self-concept clarity. There was a significant main effect of condition, $F(1,28) = 8.42$, $p = .007$, partial $\eta^2 = .23$, no effect of time, $F(1,28) = 3.31$, $p = .08$, partial $\eta^2 = .11$, but a significant interaction between time and condition, $F(1,28) = 6.28$, $p = .018$, partial $\eta^2 = .18$. Figure 9 illustrates this interaction. Post hoc analysis indicated that levels of state self-concept clarity significantly decreased post-imagery manipulation in the positive condition, $t(15) = 2.84$, $p = .013$, $r = .59$. In comparison, there was no significant difference between pre and post state self-concept clarity scores in the negative condition, $t(13) = -.56$, $p = .59$, $r = .15$. However, the negative condition reported significantly higher levels of state self-concept clarity after the imagery manipulation compared to the positive condition, $t(21.66) = -3.53$, $p = .002$, $r = .60$.

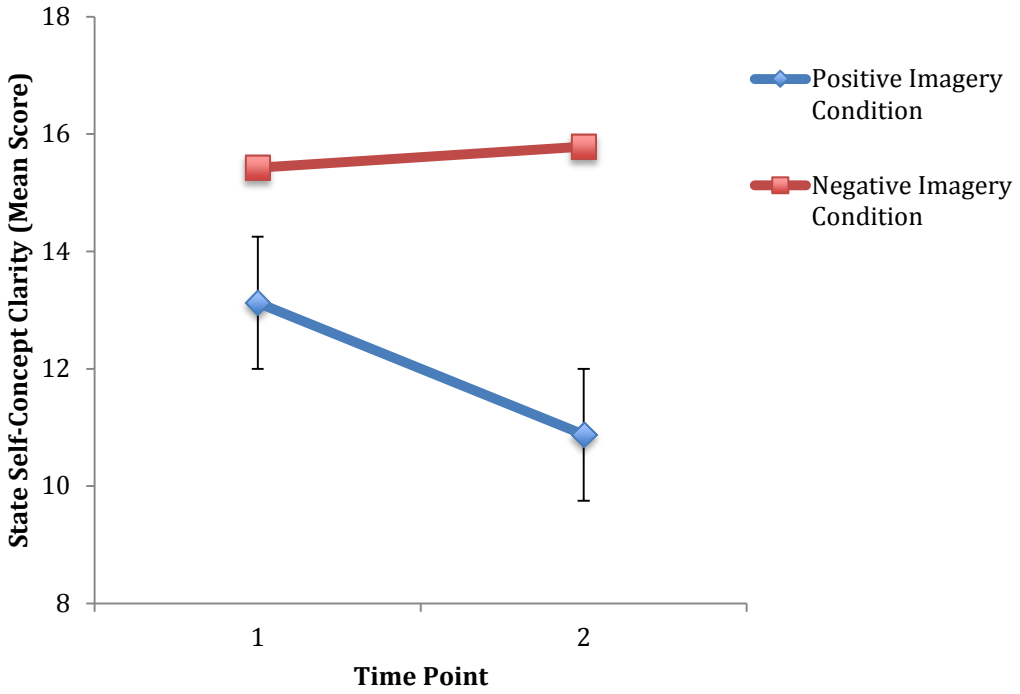


Figure 9. Mean (standard error) pre and post state self-concept clarity scores for the positive and negative self-imagery conditions in the eating disordered sample.

State self-discrepancies. There was a significant main effect of condition, $F(1,28) = 40.02$, $p < .001$, partial $\eta^2 = .59$, no effect of time, $F(1,28) = 2.11$, $p = .16$, partial $\eta^2 = .07$, but a significant time by condition interaction, $F(1,28) = 60.85$, $p < .001$, partial $\eta^2 = .69$. Figure 10 illustrates the interaction. Post hoc analysis indicated that self-discrepancies significantly decreased after the imagery manipulation in the positive condition, $t(15) = 3.70$, $p = .002$, $r = .69$ and significantly increased post-imagery manipulation in the negative condition, $t(13) = -11.03$, $p < .001$, $r = .95$. The negative condition also reported significantly higher levels of self-discrepancies after the imagery manipulation compared to the positive condition, $t(22.16) = -8.06$, $p < .001$, $r = .86$.

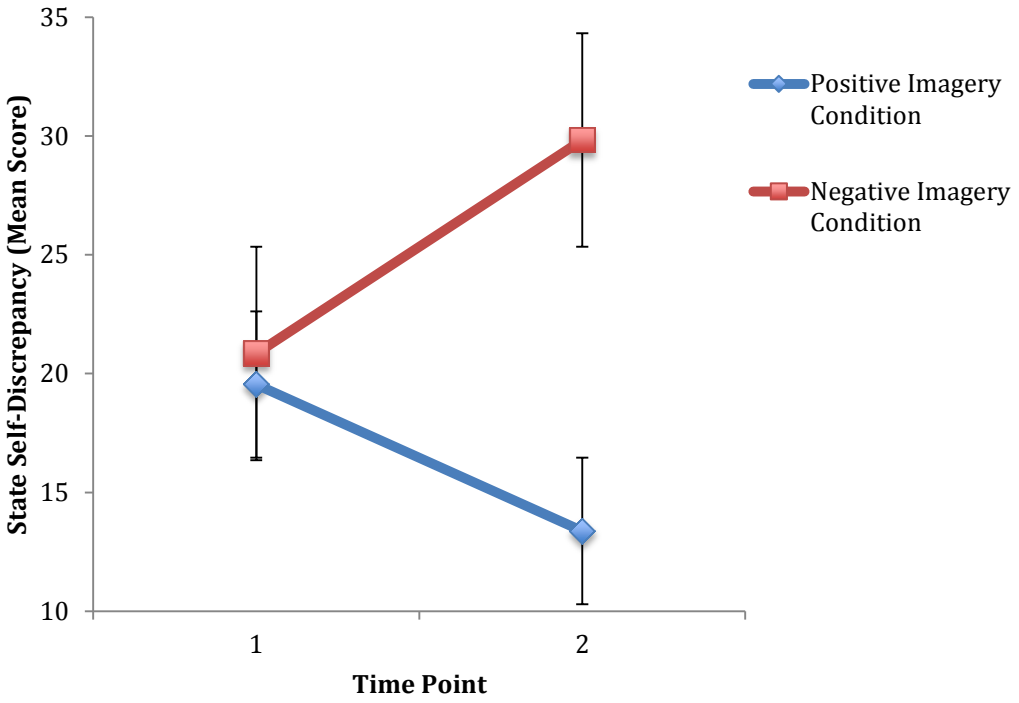


Figure 10. Mean (standard error) pre and post state self-discrepancy scores for the positive and negative self-imagery conditions in the eating disordered sample.

Affect Measures

State Positive Affect Scale. There was a significant main effect of condition, $F(1,28) = 14.19$, $p = .001$, partial $\eta^2 = .34$, no effect of time, $F(1,28) = 1.02$, $p = .32$, partial $\eta^2 = .04$, but a significant interaction between time and condition, $F(1,28) = 27.43$, $p < .001$, partial $\eta^2 = .50$. Figure 11 illustrates the interaction. Post hoc analysis indicated that positive affect significantly increased post-imagery manipulation in the positive condition, $t(15) = -2.94$, $p = .010$, $r = .60$, and significantly decreased after the imagery manipulation in the negative condition, $t(13) = 6.61$, $p < .001$, $r = .89$. The positive condition also reported significantly higher levels of positive affect after the imagery manipulation compared to the negative condition, $t(28) = 5.15$, $p < .001$, $r = .70$.

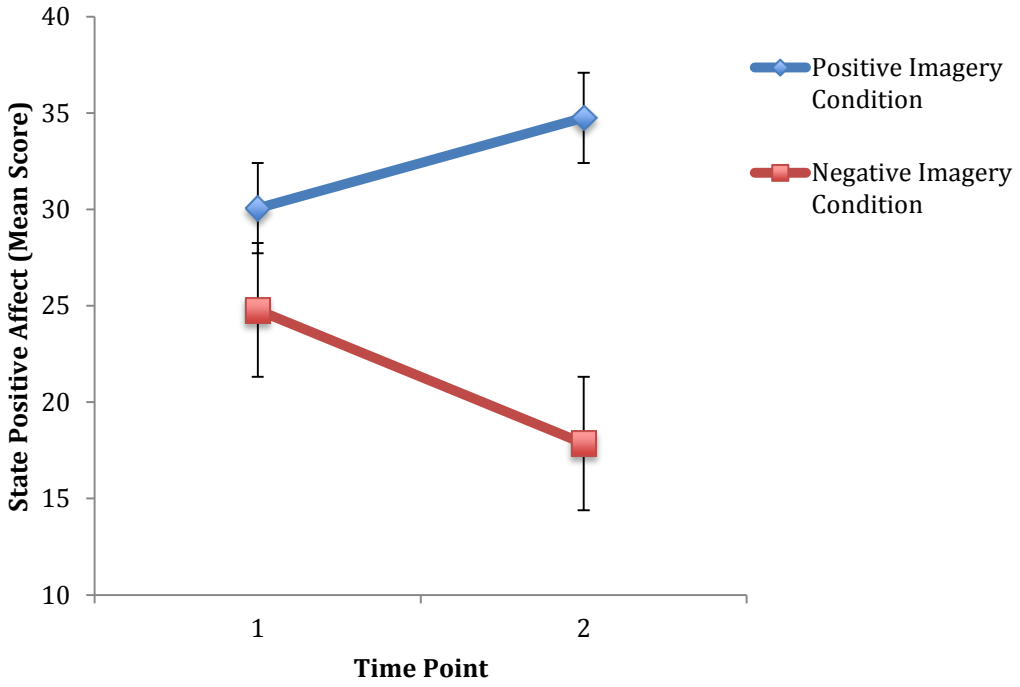


Figure 11. Mean (standard error) pre and post state positive affect scores for the positive and negative self-imagery conditions in the eating disordered sample.

State Negative Affect Scale. There were significant main effects of condition, $F(1,28) = 11.25$, $p = .002$, partial $\eta^2 = .29$ and time, $F(1,28) = 6.29$, $p = .018$, partial $\eta^2 = .18$, and a significant interaction between time and condition, $F(1,28) = 18.42$, $p < .001$, partial $\eta^2 = .40$. Figure 12 illustrates the interaction. Post hoc analysis indicated that levels of negative affect significantly increased after the imagery manipulation in the negative condition, $t(13) = 5.84$, $p < .001$, $r = .85$. In comparison, there was no significant difference between pre and post levels of negative affect in the positive condition, $t(15) = -1.88$, $p = .08$, $r = .44$. However, the positive condition reported significantly lower levels of negative affect after the imagery manipulation compared to the negative condition, $t(21.17) = 5.48$, $p < .001$, $r = .77$.

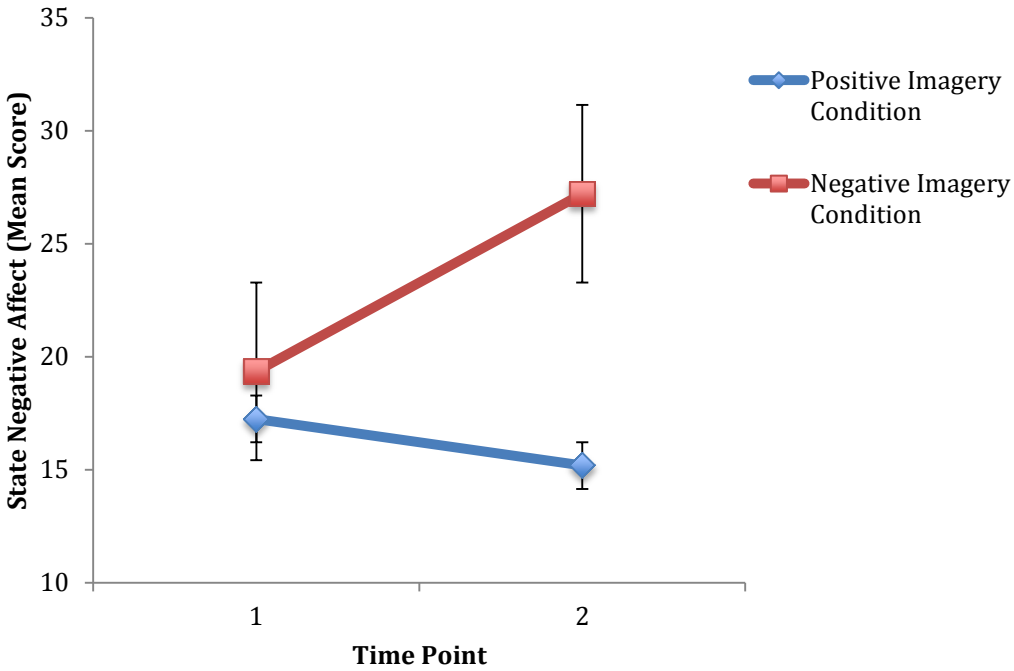


Figure 12. Mean (standard error) pre and post state negative affect scores for the positive and negative self-imagery conditions in the eating disordered sample.

Discussion of Results

Consistent with the results of the whole sample, a significant time by condition interaction was found for each variable when the data from the eating disordered sample were analysed alone. With the exception of three, the post hoc independent and repeated measures t-tests from the eating disordered sample were all consistent with the results of the whole sample. The three exceptions will now be discussed.

The first exception relates to the explicit positive self-esteem variable. There was no significant difference between pre and post positive self-esteem scores in the positive condition in the eating disordered sample however, a significant difference was found when data from the whole sample were analysed. The data from the

eating disordered sample were approaching significance and therefore, the difference between the results is likely to be explained by the small sample size (of the eating disordered sample) and reduced power of this calculation, namely .70.

The second difference relates to the state self-concept clarity variable. The post hoc independent t-test in the eating disordered sample found that the negative condition reported significantly higher levels of state self-concept clarity after the imagery manipulation compared to the positive condition. However, no significant difference was found between these two conditions in the whole sample. The difference between the results may be explained by participants with eating disorders having lower 'core self-esteem' (Fairburn et al., 2003). Therefore, their levels of state self-concept clarity may be more sensitive to the negative imagery manipulation compared to the positive imagery manipulation, resulting in a significant difference between the two conditions post manipulation in the eating disordered sample. The reduced power of this calculation (.68) may also contribute to the difference between the findings of the two samples.

The final difference relates to the state negative affect variable. Within the eating disordered sample no significant difference was found between pre and post levels of negative affect in the positive imagery condition however, negative affect significantly decreased post-imagery manipulation in this condition when data from the whole sample were analysed. Once again, the difference between the results is likely to be explained by the small sample size of the eating disordered sample and reduced power of this calculation, namely .31.

List of References

Aardoom, J. J., Dingemans, A. E., Slof Op't Landt, M. C., & Van Furth, E. F. (2012). Norms and discriminative validity of the Eating Disorder Examination-Questionnaire (EDE-Q). *Eating Behaviors*, *13,* 305-309. doi: 10.1016/j.eatbeh.2012.09.002

Agras, W. S., Walsh, B. T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000). A multicenter comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry*, *57*(5), 459-466. doi: 10.1001/archpsyc.57.5.459

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed. Revised). Washington, DC: Author.

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

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. Text Revision). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anderson, N. H. (1968). Likableness ratings of 555 personality-trait words. *Journal of Personality and Social Psychology*, *9*(3), 272-279. doi: 10.1037/h0025907

Andersen, A. E. (1999). Eating disorders in males: Critical questions. In R. Lemberg, & L. Cohn (Eds.), *Eating disorders: A reference sourcebook* (pp. 73-79). . Arizona, AZ: The Oryx Press.

Andrews, B., & Brown, G. (1993). Self-esteem and vulnerability to depression: The concurrent validity of interview and questionnaire measures. *Journal of Abnormal Psychology, 102,* 565-572. doi: 10.1037//0021-843X.102.4.565

Bardone-Cone, A. M., Schaefer, L. M., Maldonado, C. R., Fitzsimmons, E. E. , Harney, M. B., Lawson, M. A., ... & Smith, R. (2010). Aspects of self-concept and eating disorder recovery: What does the sense of self look like when an individual recovers from an eating disorder? *Journal of Social and Clinical Psychology*, *29*(7), 821-846. doi: 10.1521/jscp.2010.29.7.821

Baumgardner, A. H. (1990). To know oneself is to like oneself: Self-certainty and self-affect. *Journal of Personality and Social Psychology, 58*(6), 1062-1072. doi:10.1037/0022-3514.58.6.1062

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory-II.* San Antonio, TX: The Psychological Corporation.

Beck, A. T., Ward, C., & Mendelson, M. (1961). Beck Depression Inventory (BDI). *Archives of General Psychiatry*, *4*(6), 561-571

Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2011). Psychometric valuation of the Eating Disorder Examination and Eating Disorder Examination-Questionnaire: A systematic review of the literature. *International Journal of Eating Disorders, 45*, 428–438. doi: 10.1002/eat.20931

Bers, S. A., Blatt, S. J., & Dolinsky, A. (2004). The sense of self in anorexia nervosa patients. *The Psychoanalytic Study of the Child*, *59*, 294-315

Bers, S. A., & Quinlan, D. M. (1992). Perceived-competence deficit in anorexia nervosa. *Journal of Abnormal Psychology*, *101*(3), 423-431. doi: 10.1037/0021-843X.101.3.423

Blechert, J., Ansorge, U., Beckmann, S., & Tuschen-Caffier, B. (2011). The undue influence of shape and weight on self-evaluation in anorexia nervosa, bulimia nervosa and restrained eaters: A combined ERP and behavioral study. *Psychological Medicine*, *41*(1), 185-194. doi: 10.1017/S0033291710000395

Bosson, J. K., Swann Jr, 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*(4), 631-643. doi: 10.1037/0022-3514.79.4.631

Brewin, C. R. (2006). Understanding cognitive behaviour therapy: A retrieval competition account. *Behaviour Research and Therapy, 44*(6), 765-784. doi: 10.1016/j.brat.2006.02.005

Brockmeyer, T., Holtforth, M. G., Bents, H., Kämmerer, A., Herzog, W., & Friederich, H. C. (2013). The thinner the better: Self-esteem and low body weight in anorexia nervosa. *Clinical Psychology and Psychotherapy*, *20*(5), 394-400. doi: 10.1002/cpp.1771

Brown, J. D., & Marshall, M. A. (2006). The three faces of self-esteem. In M. H. Kernis (Ed.), *Self-esteem issues and answers: A sourcebook of current perspectives* (pp. 4-9). East Sussex, England: Psychology Press.

Butler, A. C., Hokanson, J. E., & Flynn, H. A. (1994). A comparison of self-esteem lability and low trait self-esteem as vulnerability factors for depression. *Journal of Personality and Social Psychology*, *66*(1), 166-177. doi: 10.1037/0022-3514.66.1.166

Butzer, B., & Kuiper, N. A. (2006). Relationships between the frequency of social comparisons and self-concept clarity, intolerance of uncertainty, anxiety, and depression. *Personality and Individual Differences*, *41*(1), 167-176. doi: 10.1016/j.paid.2005.12.017

Caglar-Nazali, H. P., Corfield, F., Cardi, V., Ambwani, S., Leppanen, J., Olabintan, O., ... & Treasure, J. (2014). A systematic review and meta-analysis of 'Systems for Social Processes' in eating disorders. *Neuroscience and Biobehavioral Reviews*, *42*, 55-92. doi: 10.1016/j.neubiorev.2013.12.002

Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology, 59*(3), 538-549. doi: 10.1037/0022-3514.59.3.538

Campbell, J. D., & Fehr, B. (1990). Self-esteem and perceptions of conveyed impressions: Is negative affectivity associated with greater realism? *Journal of Personality and Social Psychology*, *58*(1), 122-133. doi: 10.1037/0022-3514.58.1.122

Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates and cultural boundaries. *Journal of Personality and Social Psychology, 70*(1), 141-156. doi: 10.1037/0022-3514.70.1.141

Cardi, V., Di Matteo, R., Gilbert, P., & Treasure, J. (2014). Rank perception and self- evaluation in eating disorders. *International Journal of Eating Disorders*, *47*(5), 543-552. doi: 10.1002/eat.22261

Cast, A. D., & Burke, P. J. (2002). A theory of self-esteem. *Social Forces*, *80*(3), 041-1068. doi: 10.1353/sof.2002.0003

Cockell, S. J., Hewitt, P. L., Seal, B., Sherry, S., Goldner, E. M., Flett, G. L., & Remick, R. A. (2002). Trait and self-presentational dimensions of perfectionism among women with anorexia nervosa. *Cognitive Therapy and Research*, *26*(6), 745-758. doi: 10.1023/A:1021237416366

Cockerham, E., Stopa, L., Bell, L., & Gregg, A. (2009). Implicit self-esteem in bulimia nervosa. *Journal of Behavior Therapy & Experimental Psychiatry , 40*(2), 265-273. doi: 10.1016/j.jbtep.2008.12.003

Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107*(2), 261-288. doi: 10.1037/0033-295X.107.2.261

Conway, M. A., Singer, J. A., & Tagini, A. (2004). The self and autobiographical memory: Correspondence and coherence. *Social Cognition, 22*(5), 491-529. doi: 10.1521/soco.22.5.491.50768

Cooper, M. J., Deepak, K., Grocutt, E., & Bailey, E. (2007). The experience of 'feeling fat' in women with anorexia nervosa, dieting and non-dieting women: An exploratory study. *European Eating Disorders Review*, *15*(5), 366-372. doi: 10.1002/erv.785

Cooper, M. J., Todd, G., & Turner, H. (2007). The effects of using imagery to modify core emotional beliefs in bulimia nervosa: An experimental pilot study. *Journal of Cognitive Psychotherapy, 21*(2), 117-122. doi: 10.1891/088983907780851577

Cooper, M., & Turner, H. (2000). Underlying assumptions and core beliefs in anorexia nervosa and dieting. *British Journal of Clinical Psychology*, *39*(2), 215-218. doi: 10.1348/014466500163239

Corcoran, K., & Fisher, J. (1987). *Measures for clinical practice: A new sourcebook.* New York, NY: The Free Press.

Corning, A. F. (2002). Self-esteem as a moderator between perceived discrimination and psychological distress among women. *Journal of Counseling Psychology*, *49*(1), 117-126. doi: 10.1037/0022-0167.49.1.117

Corte, C., & Stein, K. F. (2005). Body-weight self-schema: Determinant of mood and behavior in women with an eating disorder. *Journal of Applied Social Psychology*, *35*(8), 1698-1718. doi: 10.1111/j.1559-1816.2005.tb02191.x

Daley, K. A., Jimerson, D. C., Heatherton, T. F., Metzger, E. D., & Wolfe, B. E. (2008). State self-esteem ratings in women with bulimia nervosa and bulimia nervosa in remission. *International Journal of Eating Disorders*, *41*(2), 159-163. doi: 10.1002/eat.20447

Damon, W., & Hart, D. (1982). The development of self-understanding from infancy through adolescence. *Child Development*, *53*(4), 841-864. doi: 10.2307/1129122

De Houwer, J. (2003). The extrinsic affective Simon task. *Experimental Psychology*, *50*(2), 77-85. doi: 10.1026//1618-3169.50.2.77

De Raedt, R., Schacht, R., Franck, E., & De Houwer, J. (2006). Self-esteem and depression revisited: Implicit positive self-esteem in depressed patients? *Behaviour Research and Therapy, 44*(7), 1017-1028. doi: 10.1016/j.brat.2005.08.003

Deusinger, I. M. (1986). *The Frankfurt self-concept scale: Test manual.* Göttingen, Germany: Hogrefe.

Dickersin, K. (1990). The existence of publication bias and risk factors for its occurrence. *The Journal of the American Medical Association, 263*(10), 1385-1389. doi: 10.1001/jama.1990.03440100097014

Dittmar, H., Beattie, J., & Friese, S. (1996). Objects, decision considerations and self-image in men's and women's impulse purchases. *Acta Psychologica*, *93*(1), 187-206. doi: 10.1016/0001-6918(96)00019-4

Dittmar, H., Halliwell, E., & Stirling, E. (2009). Understanding the impact of thin media models on women's body-focused affect: The roles of thin-ideal internalization and weight-related self-discrepancy activation in experimental exposure effects. *Journal of Social and Clinical Psychology*, *28*(1), 43-72. doi: 10.1521/jscp.2009.28.1.43

Fairburn, C. (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: Guilford Press.

Fairburn, C.G., Beglin, S.J. (1994). Assessment of eating disorder psychopathology: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16,* 363-370. doi: 10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#

Fairburn, C. G., & Cooper, Z. (1993). The Eating Disorder Examination (12th edition). In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 317-360). New York, NY: Guilford Press.

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

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*(5), 468-476. doi:10.1001/archpsyc.56.5.468

Fairburn, C. G., Cooper, Z., & O'Connor, M. E. (2014). *Eating Disorder Examination* (Edition 17.0). Oxford, England: University of Oxford.

Fairburn, C., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41*, 509–528. doi: 10.1016/S0005-7967(02)00088-8

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*(3), 223-224. doi: 10.1111/j.2044-8260.1987.tb01349.x

Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993). Cognitive-behaviour 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, NY: Guilford Press.

Fairburn, C., Norman, P. A., Welch, S. L., O'Connor, M. E., Doll, H., & Peveler, R. (1995). A prospective study of outcome in bulimia nervosa and the long-term effects of three psychological treatments. *Archives of General Psychiatry, 52*(4), 304-312. doi: 10.1001/archpsyc.1995.03950160054010

Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology*, *61*(4), 696-698. doi: 10.1037/0022-006X.61.4.696

Fairburn, C. G., Shafran, R., & Cooper, Z. (1999). A cognitive behavioural theory of anorexia nervosa. *Behaviour Research and Therapy*, *37*(1), 1-13. doi: 10.1016/S0005-7967(98)00102-8

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). Malden, England: Blackwell Publishing.

Farrar, S., Stopa, L., & Turner, H. (2015). Self-imagery in individuals with high body dissatisfaction: The effect of positive and negative self-imagery on aspects of the self-concept. *Journal of Behavior Therapy and Experimental Psychiatry*, *46*, 8-13. doi: 10.1016/j.jbtep.2014.07.011

Fennell, M. (2009). *Overcoming low self-esteem: A self-help guide using cognitive behavioral techniques*. London, UK: Robinson Publishing Ltd.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, CA: Sage Publications Inc.

Garner, D. M. (1991). *Eating disorders inventory 2: Professional manual.* Odessa, FL: Psychological Assessment Resources Inc.

Garner, D. M., & Bemis, K. M. (1982). A cognitive-behavioral approach to anorexia nervosa. *Cognitive Therapy and Research*, *6*(2), 123-150. doi: 10.1007/BF01183887

Garner, D. M., & Garfinkel, P. E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, *9*(2), 273-279. doi: 10.1017/S0033291700030762

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, *12*(4), 871-878. doi: 10.1017/S0033291700049163

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

Gecas, V., & Schwalbe, M. L. (1983). Beyond the looking-glass self: Social structure and efficacy-based self-esteem. *Social Psychology Quarterly*, *46*(2), 77-88. doi: 10.2307/3033844

Geller, J., Cockell, S. J., Hewitt, P. L., Goldner, E. M., & Flett, G. L. (2000). Inhibited expression of negative emotions and interpersonal orientation in anorexia nervosa. *International Journal of Eating Disorders*, *28*(1), 8-19. doi: 10.1002/1098-108X(200007)28:1<8::AID-EAT2>3.0.CO;2-U

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*(3), 285-298. doi: 10.1002/(SICI)1098-108X(199811)24:3<285::AID-EAT6>3.0.CO;2-I

Gräfe, K., Zipfel, S., Herzog, W., & Löwe, B. (2004). Screening psychischer störungen mit dem gesundheitsfragebogen für patienten. *Diagnostica*, *50*(4), 171-181. doi: 10.1026/0012-1924.50.4.171

Gray-Little, B., Williams, V. S., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, *23*(5), 443-451. doi: 10.1177/0146167297235001

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem and stereotypes. *Psychological Review, 102*(1), 4-27. doi: 10.1037/0033-295X.102.1.4

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, *109*(1), 3-25. doi: 10.1037/0033-295X.109.1.3

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*(6), 1022-1038. doi: 10.1037/0022-3514.79.6.1022

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*(2), 197-216. doi: 10.1037/0022-3514.85.2.197

Griffiths, R. A., Beumont, P. J., Giannakopoulos, E., Russell, J., Schotte, D., Thornton, C., ... & Varano, P. (1999). Measuring self-esteem in dieting disordered patients: The validity of the Rosenberg and Coopersmith contrasted. *International Journal of Eating Disorders, 25*(2), 227-231.doi: 10.1002/(SICI)1098-108X(199903)25:2<227::AID-EAT13>3.0.CO;2-4

Guest, T. (2000). Using the Eating Disorder Examination in the assessment of bulimia and anorexia: Issues of reliability and validity. *Social Work in Health Care*, *31*(4), 71-83. doi: 10.1300/J010v31n04_05

Hackmann, A., Surawy, C., & Clark, D. M. (1998). Seeing yourself through others' eyes: A study of spontaneously occurring images in social phobia. *Behavioural and Cognitive Psychotherapy, 26*(1), 3-12. doi: 10.1017/S1352465898000022

Harter, S. (1986). *Manual: Self-perception profile for adolescents.* Denver, CO: University of Denver.

Harter, S. (1990). Adolescent self and identity development. In S. S. Feldman, & G. R. Elliot (Eds.), *At the threshold: The developing adolescent* (pp. 352-387). Cambridge, MA: Harvard University Press.

Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, *60*(6), 895-910. doi: 10.1037/0022-3514.60.6.895

Heatherton, T. F., Wyland, C. L., & Lopez, S. J. (2003). Assessing self-esteem. In S. J. Lopez, & C. R. Snyder (Eds.), *Positive psychological assessment: A handbook of models and measures* (pp. 219-233). Washington, DC: American Psychological Association.

Herman, C. P., & Polivy, J. (1980). Restrained eating. In A. Stunkard (Ed.). *Obesity* (pp. 208-225). Philadelphia, PA: Saunders.

Hetts, J. J., & Pelham, B. W. (2001). A case for the nonconscious self-concept. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The princeton symposium on the legacy and future of social cognition* (pp. 105-123). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319-340. doi: 10.1037/0033-295X.94.3.319

Higgins, E. T. (1989). Self-discrepancy theory: What patterns of self-beliefs cause people to suffer? *Advances in Experimental Social Psychology*, *22*, 93-136.

Higgins, E. T., Klein, R., & Strauman, T. (1985). Self-concept discrepancy theory: A psychological model for distinguishing among different aspects of depression and anxiety. *Social Cognition*, *3*(1), 51-76. doi: 10.1521/soco.1985.3.1.51

Hinrichsen, H., Morrison, T., Waller, G., & Schmidt, U. (2007). Triggers of self-induced vomiting in bulimic disorders: The roles of core beliefs and imagery. *Journal of Cognitive Psychotherapy, 21*(3), 261-272. doi: 10.1891/088983907781494528

Howell, D. (2004). *Fundamental statistics for the behavioural sciences* (5th ed.). London, England: Thomson-Brooks/Cole.

Hulme, N., Hirsch, C., & Stopa, L. (2012). Images of the self and self-esteem: Do positive self-images improve self-esteem in social anxiety? *Cognitive Behaviour Therapy*, *41*(2), 163-173. doi: 10.1080/16506073.2012.664557

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. doi: 10.1037/0033-2909.130.1.19

Jacobi, C., Paul, T., de Zwaan, M., Nutzinger, D. O., & Dahme, B. (2004). Specificity of self-concept disturbances in eating disorders. *International Journal of Eating Disorders*, *35*(2), 204-210. doi: 10.1002/eat.10240

Joiner, G. W., & Kashubeck, S. (1996). Acculturation, body image, self-esteem, and eating-disorder symptomatology in adolescent Mexican American women. *Psychology of Women Quarterly*, *20*(3), 419-435. doi: 10.1111/j.1471-6402.1996.tb00309.x

Joiner, T. E., Katz, J., & Lew, A. (1999). Harbingers of depressotypic reassurance seeking: Negative life events, increased anxiety, and decreased self-esteem. *Personality and Social Psychology Bulletin*, *25*(5), 632-639. doi: 10.1177/0146167299025005008

Joiner, T. E., Schmidt, N. B., & Wonderlich, S. A. (1997). Global self-esteem as contingent on body satisfaction among patients with bulimia nervosa: Lack of diagnostic specificity? *International Journal of Eating Disorders*, *21*(1), 67-76. doi: 10.1002/(SICI)1098-108X(199701)21:1<67::AID-EAT8>3.0.CO;2-1

Kelly, A. C., Vimalakanthan, K., & Carter, J. C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: An examination of female students and eating disorder patients. *Eating Behaviors*, *15*(3), 388-391. doi: 10.1016/j.eatbeh.2014.04.008

Kernis, M. H. (2003). Toward a conceptualization of optimal self-esteem. *Psychological Inquiry*, *14*(1), 1-26. doi: 10.1207/S15327965PLI1401_01

Kernis, M. H. (2013). *Self-esteem issues and answers: A sourcebook of current perspectives*. East Sussex, England: Psychology Press.

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*(4), 311-330. doi: 10.1080/15298860500146028

Kernis, M. H., Grannemann, B. D., & Mathis, L. C. (1991). Stability of self-esteem as a moderator of the relation between level of self-esteem and depression. *Journal of Personality and Social Psychology*, *61*(1), 80-84. doi: 10.1037/0022-3514.61.1.80

Kiezebrink, K., Campbell, D., Mann, E., & Blundell, J. (2009). Similarities and differences between excessive exercising anorexia nervosa patients compared with DSM-IV defined anorexia nervosa subtypes. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *14*(4), 199-204. doi: 10.1007/BF03325117

Leung, N., & Price, E. (2007). Core beliefs in dieters and eating disordered women. *Eating Behaviors*, *8*(1), 65-72. doi: 10.1016/j.eatbeh.2006.01.001

Link, B. G., Struening, E. L., Neese-Todd, S., Asmussen, S., & Phelan, J. C. (2014). Stigma as a barrier to recovery: The consequences of stigma for the self-esteem of people with mental illnesses. *Psychiatric Services, 52*(12), 1621-1626. doi: 10.1176/appi.ps.52.12.1621

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35*(2), 63-78. doi: 10.1037/0022-3514.35.2.63

McFarland, C., & Ross, M. (1982). Impact of causal attributions on affective reactions to success and failure. *Journal of Personality and Social Psychology*, *43*(5), 937-946. doi:10.1037/0022-3514.43.5.937

Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., ... & Swendsen, J. (2010). Lifetime prevalence of mental disorders in US adolescents: Results from the national comorbidity survey replication–adolescent supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*(10), 980-989. doi:10.1016/j.jaac.2010.05.017

Mond, J. M., Hay, P. J., Rodgers, B., Owen, C., & Beumont, P. J. V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy*, *42*(5), 551-567. doi: 10.1016/S0005-7967(03)00161-X

Montgomery, S. A., & Asberg, M. A. (1979). A new depression scale designed to be sensitive to change. *The British Journal of Psychiatry*, *134*(4), 382-389. doi: 10.1192/bjp.134.4.382

Murrell, S. A., Meeks, S., & Walker, J. (1991). Protective functions of health and self-esteem against depression in older adults facing illness or bereavement. *Psychology and Aging*, *6*(3), 352-360. doi:10.1037/0882-7974.6.3.352

Nezlek, J. B., & Plesko, R. M. (2001). Day-to-day relationships among self-concept clarity, self-esteem, daily events, and mood. *Personality and Social Psychology Bulletin*, *27*(2), 201-211. doi: 10.1177/0146167201272006

O'Brien, E. J., & Epstein, S. (1988). *The multi-dimensional self-esteem inventory.* Odessa, FL: Psychological Assessment Resources Inc.

Ohanian, V. (2002). Imagery rescripting within cognitive behavior therapy for bulimia nervosa: An illustrative case report. *International Journal of Eating Disorders, 31*(3), 352-357. doi: 10.1002/eat.10044

Orth, U., Robins, R. W., & Roberts, B. W. (2008). Low self-esteem prospectively predicts depression in adolescence and young adulthood. *Journal of Personality and Social Psychology*, *95*(3), 695-708. doi: 10.1037/0022-3514.95.3.69d

Paterson, G., Power, K., Collin, P., Greirson, D., Yellowlees, A., & Park, K. (2011). A mediational model of self-esteem and social problem-solving in anorexia nervosa. *European Eating Disorders Review*, *19*(2), 112-120. doi: 10.1002/erv.1021

Paterson, G., Power, K., Yellowlees, A., Park, K., & Taylor, L. (2007). The relationship between two-dimensional self-esteem and problem solving style in an anorexic inpatient sample. *European Eating Disorders Review*, *15*(1), 70-77. doi: 10.1002/erv.708

Radloff, L. S. (1977). The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*(3), 385-401. doi: 10.1177/014662167700100306

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*(2), 151-161. doi: 10.1177/0146167201272002

Robins, R. W., Trzesniewski, K. H., Tracy, J. L., Gosling, S. D., & Potter, J. (2002). Global self-esteem across the life span. *Psychology and Aging*, *17*(3), 423. doi: 10.1037/0882-7974.17.3.423

Rodin, J., Silberstein, L., & Striegel-Moore, R. (1985). Women and weight: A normative discontent. In T. B. Sonderegger (Ed.), *Psychology and gender: Nebraska symposium on motivation*. Lincoln, NE: University of Nebraska Press.

Rosen, J. C., & Ramirez, E. (1998). A comparison of eating disorders and body dysmorphic disorder on body image and psychological adjustment. *Journal of Psychosomatic Research*, *44*(3), 441-449. doi: 10.1016/S0022-3999(97)00269-9

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

Rosenberg, M. (1989). *Society and the adolescent self-image* (rev. ed.). Middletown, CT England: Wesleyan University Press.

Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, 141-156. doi: 10.2307/2096350

Rothermund, K., & Wentura, D. (2004). Underlying processes in the implicit association test: Dissociating salience from associations. *Journal of Experimental Psychology: General*, *133*(2), 139-165. doi: 10.1037/0096-3445.133.2.139

Senra, C., Sánchez-Cao, E., Seoane, G., & Leung, F. Y. (2007). Evolution of self-concept deficits in patients with eating disorders: The role of family concern about weight and appearance. *European Eating Disorders Review*, *15*(2), 131-138. doi: 10.1002/erv.733

Sepulveda, A. R., Carrobles, J. A., & Gandarillas, A. M. (2008). Gender, school and academic year differences among Spanish university students at high-risk for developing an eating disorder: An epidemiologic study. *BMC Public Health*, *8*(1), 102-110. doi: 10.1186/1471-2458-8-102

Shahar, G., & Davidson, L. (2003). Depressive symptoms erode self-esteem in severe mental illness: A three-wave, cross-lagged study. *Journal of Consulting and Clinical Psychology*, *71*(5), 890-900. doi: 10.1037/0022-006X.71.5.890

Silvera, D. H., Bergersen, T. D., Bjørgum, L., Perry, J. A., Rosenvinge, J. H., & Holte, A. (1998). Analyzing the relation between self-esteem and eating disorders: Differential effects of self-liking and self-competence. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *3*(2), 95-99. doi: 10.1007/BF03339995

Somerville, K., Cooper, M. J., & Hackmann, A. (2007). Spontaneous imagery in women with bulimia nervosa: An investigation into content, characteristics and links to childhood memories. *Journal of Behavior Therapy and Experimental Psychiatry, 38*(4), 435-446. doi: 10.1016/j.jbtep.2007.09.003

Stopa, L. (2009). *Imagery and the threatened self: Perspectives on mental imagery and the self in cognitive therapy*. New York, NY: Routledge/Taylor & Francis Group.

Stopa, L. Brown, M. A., & Hirsch, C. R. (2011). *Seeing myself and knowing myself: Images and self-representation in social anxiety.* Unpublished manuscript.

Strauman, T. J., Vookles, J., Berenstein, V., Chaiken, S., & Higgins, E. T. (1991). Self-discrepancies and vulnerability to body dissatisfaction and disordered eating. *Journal of Personality and Social Psychology*, *61*(6), 946-956. doi: 10.1037/0022-3514.61.6.946

Sullivan, P. F., Bulik, C. M., Fear, J. L., & Pickering, A. (1998). Outcome of anorexia nervosa: a case-control study. *American Journal of Psychiatry*, *155*(7), 939-946. doi: 10.1176/ajp.155.7.939

Surgenor, L. J., Maguire, S., Russell, J., & Touyz, S. (2007). Self-liking and self-competence: Relationship to symptoms of anorexia nervosa. *European Eating Disorders Review, 15*(2), 139-145. doi: 10.1002/erv.734

Tafarodi, R. W., & Swann Jr, W. B. (1995). Self-linking and self-competence as dimensions of global self-esteem: Initial validation of a measure. *Journal of Personality Assessment*, *65*(2), 322-342. doi: 10.1207/s15327752jpa6502_8

Tafarodi, R. W., & Swann, W. B. (2001). Two-dimensional self-esteem: Theory and measurement. *Personality and Individual Differences*, *31*(5), 653-673. doi: 10.1016/S0191-8869(00)00169-0

Vanderlinden, J., Kamphuis, J. H., Slagmolen, C., Wigboldus, D., Pieters, G., & Probst, M. (2009). Be kind to your eating disorder patients: The impact of positive and negative feedback on the explicit and implicit self-esteem of female patients with eating disorders. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *14*(4), 237-242. doi: 10.1007/BF03325124

Vince, E. P., & Walker, I. (2008). A set of meta-analytic studies on the factors associated with disordered eating. *The Internet Journal of Mental Health*, *5*(1), 1-23. Retrieved from https://ispub.com/IJMH/5/1/12151

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063

Wilkish, S., & Wade, T. D. (2004). Differences between women with anorexia nervosa and restrained eaters on shape and weight concerns, self-esteem, and depression. *International Journal of Eating Disorders*, *35*(4), 571-578. doi: 10.1002/eat.10273

Williams, C. J., Power, K. G., Millar, H. R., Freeman, C. P., Yellowlees, A., Dowds, T., ... & Jackson, M. A. (1993). Comparison of eating disorders and other dietary/weight groups on measures of perceived control, assertiveness, self-esteem, and self-directed hostility. *International Journal of Eating Disorders*, *14*(1), 27-32. doi: 10.1002/1098-108X(199307)14:1<27::AID-EAT2260140104>3.0.CO;2-F

Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: Implications for narcissism and self-esteem instability. *Journal of Personality*, *74*(1), 119-144. doi: 10.1111/j.1467-6494.2005.00371.x

Zeigler-Hill, V. (2013). *Self-esteem*. East Sussex, England: Psychology Press.