**Abstract**

*Background and Objectives:* Cognitive behavioural models of eating disorders highlight low self-esteem as a maintaining factor. This study explored the impact of positive and negative self-imagery on aspects of the working self (implicit and explicit self-esteem and self-concept clarity) in individuals with high body dissatisfaction (an important aspect of eating disorders). The impact of these images on state body satisfaction and affect was also explored. *Method:* A group of participants with high body dissatisfaction completed measures of explicit self-esteem, self-concept clarity, state body satisfaction and affect prior to completing a negative (*n* = 33) or positive (*n* = 33) self-imagery retrieval task. Following this they completed the baseline measures and a measure of implicit self-esteem. *Results:* Holding a negative self-image in mind had a negative effect on explicit self-esteem, whilst holding a positive self-image had a beneficial effect. There were no effects of imagery on implicit self-esteem. Holding a negative image in mind led to a significant reduction in self-concept clarity; however, positive self-imagery did not affect self-concept clarity. Holding a negative self-image in mind led to a decrease in body satisfaction and state affect. The opposite was found for the positive self-imagery group. *Limitations:* implicit self-esteem was not measured at baseline. *Conclusions:* Imagery techniques which promote positive self-images may help improve aspects of the working self, body satisfaction and affect in individuals with high levels of body dissatisfaction. As such, these imagery techniques warrant further investigation in a clinical population.

*Keywords:* self-imagery; implicit self-esteem; explicit self-esteem; self-concept clarity; body dissatisfaction.

**1.0 Introduction**

 Recent CBT models have highlighted the importance of underlying processes, such as core low self-esteem, in the development and maintenance of eating disorders (Fairburn, 2008). At the same time, there is also growing recognition that mental imagery may have an important role to play (e.g. Cooper, 2009). The research into imagery in eating disorders has demonstrated associations between imagery, early memories and beliefs such as worthlessness, defectiveness and failure, in eating disorder patients, particularly those with bulimia nervosa (BN; Hinrichsen, Morrison, Waller, & Schmidt, 2007; Somerville, Cooper, & Hackmann, 2007). The aim of this paper is to bring together these two areas of research in order to investigate the possibility that images can represent the self-concept and thus maintain eating disorders through their impact on self-esteem and other relevant aspects of the individual’s self-concept.

We have chosen to focus on individual’s with high body dissatisfaction to explore this hypothesis as body dissatisfaction represents one relatively discrete, albeit important, aspect of eating disorders. While bearing in mind Fairburn’s (2008) model of eating disorders, we have drawn on two other theoretical frameworks that provide a way of understanding the links between imagery and the self, a feature that Fairburn does not consider in his model. We are using Conway and Pleydell-Pearce’s (2000) Self Memory System (SMS) model and Brewin’s (2006) retrieval competition hypothesis to generate our hypotheses about the role of self-images in eating disorders. Both models start with the premise that individuals have multiple self-representations. Conway and Pleydell-Pearce make a distinction between the individual’s long-term self that comprises both conceptual knowledge about the self and the autobiographical knowledge store, and the individual’s ‘working self’ which is a sub-set of the long-term self that is created to achieve specific goals. It is possible to think of the working self as the individual’s current ‘on-line’ self and our hypothesis is that images activated in response to certain situations can represent this working self. Brewin’s retrieval competition hypothesis sits well with the SMS model because he argues that different self-representations compete for retrieval. The repeated activation of a negative working self increases its accessibility and inhibits the availability of alternative positive representations and thus maintains ones negative self-view.

Given the hypothesised links between imagery and the working self outlined above, we propose that negative self-images in BN represent a working self that is retrieved when thinking about eating, weight or shape. The negative content and affect associated with these images (e.g. Hinrichsen et al., 2007) suggests that this working self is likely to be characterised by negative attitudes and beliefs about the self, uncertainty about the self and high levels of body dissatisfaction. As described above, in this study, we focused on the impact of positive and negative self-imagery on the working self in a group of individuals with high body dissatisfaction. We drew on parallel work in social anxiety and operationalized the working self in terms of self-esteem (implicit and explicit) and self-concept clarity (see Hulme, Hirsch, & Stopa, 2012 for more details). The rationale for this choice is explained below.

 Self-esteem represents an active evaluative attitude towards the self (Demo & Savin-Williams, 1992). It is particulary important because of the central role ascribed to self-esteem in Fairburn’s (2008) model. However, Fairburn considers only explicit self-esteem, whereas self-esteem comprises both implicit (automatic, non-conscious self-evaluations) and explicit (conscious and deliberate self-evaluations) components (Stopa, Brown, & Hirsch, 2012). In our view, self-images are likely to tap into both systems. To date, studies that have investigated implicit self-esteem in restrained eaters and clinical eating disorder populations have found discrepancies between implicit and explicit self-esteem. Findings suggest that individuals with increased eating disorder psychopathology have low explicit and high implicit self-esteem (Cockerham, Stopa, Bell, & Gregg, 2009; Hoffmeister, Teige-Mocigemba, Blechert, Klauer, & Tuschen-Caffier, 2010). Cockerham et al. (2009) also found that the eating disorder group had a more positive implicit self-esteem bias than controls. De Raedt, Schacht, Franck, and De Houwer (2006) found this same result in a study with depressed individuals and they argue that it might represent an attempt by the self to compensate for low explicit self-esteem. In a further study exploring the impact of positive and negative feedback on implicit and explicit self-esteem, Vanderlinden, Kamphuis, Slagmolen, Wigboldus, Pieters and Probst (2009) found that eating disorder patients responded to positive feedback with an improvement in implicit self-esteem, with no effect for negative feedback. On the explicit self-esteem measure they responded in line with the nature of the feedback. In contrast, the control group was unaffected by either feedback. The observed discrepancy between the two self-esteem systems is consistent with the idea that implicit and explicit self-esteem measure two distinct, albeit related, constructs (Hetts & Pelham, 2001). Implicit self-esteem is proposed to be formed primarily through non-conscious automatic processing (Greenwald & Banaji, 1995) and therefore, unlike explicit self-esteem, it is likely to be relatively unaffected by conscious information or manipulation (Hetts & Pelham, 2001). The finding that individuals with BN experience negative self-images (e.g. Hinrichsen et al., 2007), but still report high levels of positive implicit self-esteem (Cockerham et al., 2009), suggests that consciously thinking about a negative image of one’s body is more likely to affect explicit rather than implicit self-esteem. However, in contrast, Hulme et al. (2012) found that positive and negative self-imagery retrieval affected levels of implicit self-esteem in participants with high levels of social anxiety, suggesting that imagery may impact on both conscious and unconscious aspects of the self.

**S**elf-concept clarity describes the degree to which individuals hold a clearly and consistently defined view of the self that is stable over time (Campbell et al., 1996). A high degree of certainty about one’s self-concept can contribute to a sense of control over future outcomes, which in turn, supports a positive and confident view of the self (Baumgardner, 1990). Conversely, uncertainty about the self-concept is associated with low self-esteem, less positive affect and lower congruence between perceptions of current and past behaviour (Baumgardner, 1990; Campbell, 1990). Although self-concept clarity has not been investigated in individuals with eating disorders, it is possible that the discrepancy between implicit and explicit self-esteem in individuals with BN may create doubt and uncertainty about the self and cause difficulties in maintaining a consistent self-view (Cockerham et al., 2009).

The current study investigated the impact of holding positive and negative self-images on the working self in a group of participants with high body dissatisfaction. We hypothesised that negative self-image retrieval would be associated with a negative working self, demonstrated by an increase in negative explicit self-esteem, a decrease in positive explicit self-esteem and a reduction in self-concept clarity. In contrast, we expected that positive self-image retrieval would be associated with a more positive working self. In view of the inconsistent findings regarding implicit self-esteem, we did not make a directional hypothesis. Instead, the study aimed to explore whether manipulating self-imagery impacted on implicit self-esteem in this population. Given that individuals were asked to retrieve an image of their body, we also predicted that negative self-imagery retrieval would be associated with reduced body satisfaction, increased negative affect and reduced positive affect and that positive self-image retrieval would be associated with improvements on these measures.

**2.0 Method**

* 1. **Participants**

Two hundred and sixty two students from a local university were screened using the Body Shape Questionnaire (BSQ). Of these, 138 were invited to participate as they scored 95 or above on the BSQ (one standard deviation above the mean for a student population; *M* = 71.9, *SD* = 23.6; Cooper, Taylor, Cooper, & Fairburn, 1987). Sixty nine participants completed the study, but three were excluded as they were unable to complete the imagery task. The final sample consisted of two groups, 33 participants in the positive imagery group (*Mean age* = 20.18, *SD* = 2.21) and 33 participants in the negative image group (*Mean age* = 19.73, *SD* = 1.63). There were no differences in age between the two groups, *t*(64) = .951, *p* = .345, and all participants were female. The mean length of time from screening to completion of the experimental study was 9.6 days (Range = 0-20 days).

**2.2 Measures**

 **2.2.1 Screening and Descriptives.**

***Body Shape Questionnaire (BSQ; Cooper et al., 1987).*** The BSQ was used to screen participants. It is a 34-item trait self-report measure of body shape concerns. Each item is scored on a Likert scale (1 *never*, 6 *always*) with higher scores indicating higher levels of body dissatisfaction. The BSQ has good concurrent and discriminant validity (Cooper et al., 1987).

***Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1989).** The RSES is a 10 item self-report measure of explicit self-esteem. Scores range from 10-40, with higher scores indicating higher self-esteem (Robins, Hendin, & Trzesniewski, 2001). The RSES has good internal reliability (α = .92; Corcoran & Fischer, 1987) and test-retest reliability over six months (.82; Murrell, Meeks, & Walker, 1991).

 **2.2.2 Dependent variables**

***State Self-Esteem Scale* (SSES; McFarland & Ross, 1982).** The SSES is a reliable 12-item measure of explicit state self-esteem (McFarland & Ross, 1982). The SSES consists of 12 items and participants use an 11-point Likert scale (1 *not at all,* 11 *extremely*) to indicate how much each item represents their current feelings about themselves. Two subscales can then be calculated by summing positively and negatively worded items separately, which identify elements of positive and negative self-esteem (McFarland & Ross, 1982).

***State Self-Concept Clarity Scale* (State-SCCS; Nezlek & Plesko, 2001).** The State-SCCS is a four item state measure of self-concept clarity. It consists of items 1, 4, 8 and 9 of the original Self-Concept Clarity Scale (Campbell et al., 1996) and respondents are asked to indicate how much they agree with each statement on a 5-point Likert scale (1 *strongly disagree,* 5 *strongly agree*). Lower scores represent more clearly and confidently defined self-beliefs and higher scores suggest less well defined self-beliefs. The state-SCCS is considered a reliable measure (Nezlek & Plesko, 2001).

***Positive And Negative Affect Scales* (PANAS; Watson, Clark, & Tellegen, 1988).** The PANASis a reliable and valid self-report measure of state positive and negative affect (Watson et al., 1988). The scale consists of 20 items and participants use a 5-point Likert scale (1 *very slightly or not at all*, 5 *extremely*) to indicate how much each item represents their current mood. A score for positive and negative mood can then be calculated by summing positively and negatively worded items separately.

 ***Body satisfaction.***We asked participants to answer the question ‘How satisfied are you with your body right now?’ on a 0 (*not at all satisfied*) to 10 (*extremely satisfied)* scaleas there is no published state body satisfaction scale.

***Implicit Association Test* (IAT; Greenwald & Farnham, 2000)**. The IAT is a computer based reaction time measure that assesses the relative strength of association between two concept categories. Categories in this experiment were ‘me’ words (me, I, myself, my, mine, and own), ‘not me’ words (they, them, themselves, their, theirs, and others), ‘pleasant’ words (valuable, worthy, acceptable, competent, reliable, and confident) and ‘unpleasant’ words (defective, inadequate, inferior, weak, worthless, and critical). These words were taken from a previous study that assessed implicit self-esteem in individuals with BN (Cockerham et al., 2009). The underlying assumption of the IAT is that people respond faster to congruent stimuli than to incongruent stimuli (Greenwald, Nosek, & Banaji, 2003). Within the self-esteem IAT, stronger associations between self + pleasant words (compared to self + unpleasant words) are indicated by more positive IAT-D effect scores (Greenwald et al., 2003). Stronger associations in this direction reflect more positive implicit self-esteem (Greenwald, McGhee, & Schwartz, 1998). The IAT measure of implicit self-esteem has a test-retest reliability coefficient of .52 (Greenwald & Farnham, 2000) and internal validity ranging from .52 (Greenwald & Farnham, 2000) to .69 (Bosson, Swann, & Pennebaker, 2000).

The IAT used in this experiment comprised of 7 blocks of trials. Presentation of blocks 3, 4, 6 and 7 were counterbalanced within groups to avoid order effects (Farnham, Greenwald, & Banaji, 1999). In each block, participants classified words into categories by pressing one of two keys. They did this as quickly as they could without making errors. Category labels (‘me’ and ‘not me’ for self-concept and ‘pleasant’ and ‘unpleasant’ for self-attributes) appeared in the left and right top corner of the screen in green capital letters and test words appeared in the middle of the screen in white lower case letters. The full computer screen was used and the screen background was black. Participants pressed ‘E’ on the keyboard for words associated with the left hand category and ‘I’ for words associated with the right hand category. These letters were covered by a sticker to help orient participants to the keys and to ensure the letters did not cause confusion. The category labels remained on the screen for the duration of each block whereas the target words changed randomly on each trial (with an interval time of 100ms). Errors in categorization were flagged by a red cross and a 200ms pause until the next trial continued without need for correction.

 ***Scoring the IAT.*** The IAT was scored using Greenwald et al’s. (2003) improved algorithm. Data from blocks 3, 4, 6 and 7 were used. The algorithm states that trials that have response latencies over 10,000ms should be removed and participants who respond more quickly than 300ms on over 10% of trials should be excluded. No participants met these criteria and therefore no trials or participants were excluded. Before calculating the IAT-D effect score, error trials were replaced with the block mean latency plus a 600ms penalty. To calculate the IAT-D effect, the means of each block were calculated and then a difference score was calculated between the two mean scores on the practice and test blocks. The resulting scores were divided by the pooled standard deviations and then averaged to get the IAT-D effect score.

**2.3 Experimental Task: Imagery Manipulation**

The imagery script was an adapted version of that used by Hulme et al. (2012). Participants were asked to think of either a positive or negative self-image based on their body. They closed their eyes and described the image in detail, noting any emotions or feelings towards the self that the image evoked. At the end of the task participants were asked to keep the image in mind whilst they completed the post measures.

**2.4 Manipulation Checks**

During the imagery interview participants rated the vividness of the retrieved image on a scale of 0 (*not at all vivid*) to 100 (*extremely vivid)*. If participants rated the vividness of the self-image as less than 60 they were asked for more details about the image to increase its vividness. Participants were asked to re-rate the vividness of the image and only moved on once their vividness rating was 60 or more. They also rated how positive/negative the image was on a scale of 0 (*not at all positive/negative*) to 100 (*extremely positive/negative*).At the end of the experimental session participants rated the percentage of time they kept the image in mind during the completion of the post measures on a scale of 0% (*not at all*) to 100% (*all of the time*).

**2.5 Procedure**

 Participants in the lab session read an information sheet and signed a consent form. Then they completed the RSES and four outcomes measures (SSES, state-SCCS, PANAS and the state body satisfaction question), which were counterbalanced. After the positive or negative image was elicited in the imagery interview, participants completed the four dependent measures again (counterbalanced), the IAT, and the final manipulation check. This study was approved by the local university ethics committee.

**2.6 Data Analysis**

An a priori power calculation indicated that in order to achieve a power level (1-β) of .85, we needed a total sample size of 60. Data were screened for normality of distribution and homogeneity of variance. Where data did not meet the assumptions, transformations were undertaken (Field, 2005). A series of 2 (Self-Imagery group [positive and negative]) x 2 (Time [baseline and post]) mixed ANOVAs were used to analyse all variables except the positive PANAS[[1]](#footnote-1) and the IAT. An independent samples t-test was used to analyse the IAT data. Post hoc independent and repeated measures t-tests were used to interpret the reported interactions, and the appropriate Bonferroni adjustment was applied to the p value of .05 (.05/number of tests) to reduce the chances of making a type one error (Field, 2005). A minimum statistical level of .05 was set for all tests.

**3.0 Results**

**3.1 Descriptive statistics**

Table 1 shows descriptive statistics for age and all of the baseline measures, along with the statistic values obtained from the t –tests used to measure group differences. There were no significant differences between the two groups on any of the baseline measures.

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Insert Table 1 here

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* 1. **Manipulation Checks**

There were no significant differences between the positive (*M* = 80.91, *SD* = 13.20) and negative (*M* = 86.73, *SD* = 12.87) imagery groups on vividness, *t*(64) = -1.81, *p* = .074 or on the valence of the retrieved image, *t*(64) = 1.71, *p* = .093.

The analysis did demonstrate that the percentage of time participants were able to hold onto the image whilst completing the post questionnaires varied; participants in the positive group reported holding the image in mind significantly less (*M* = 63.79 , *SD* =15.41) than those in the negative group (*M* = 78.64, *SD* = 9.21), *t*(56.99) = -4.74, *p* < .001. In order to control for this, a bivariate correlation between all dependent variables and the percentage manipulation measure was performed for each group. There were two significant correlations in the positive group: post-manipulation positive self-esteem (SSES) and post-manipulation positive affect (PANAS) (*r* = .35, *p* = .046 and *r* = .54, *p* = .001 respectively). To control for the effect of the manipulation check, we conducted two separate analyses of covariance (ANCOVAs). There was no main effect of how long participants held the image in mind on the SSES, *F*(1,63) = 2.12, *p* = .151, partial η² = .033, and no interaction between time image was held and SSE, *F*(1,63) = 0.19, *p* = .66, partial η² = .003. There was also no difference between ANCOVA and ANOVA results, therefore the latter was used. There was a main effect of the manipulation check on the positive PANAS, *F*(1, 63) = 8.55, *p* = .01, partial η² = .12, consequently we used an ANCOVA in the main analysis.[[2]](#footnote-2)

Table 2 shows the descriptive statistics for all dependent variables at baseline and post intervention.

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Insert Table 2 here

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**3.3 Self-Concept Measures**

 **3.3.1 Explicit positive state self-esteem**

 There was a main effect of group, *F*(1,64) = 10.39, *p* = .002, partial η² = .14 and a significant time by group interaction, *F*(1,64) = 95.10, *p* < .001, partial η² = .60, but no main effect of time, *F*(1,64) = 3.25, *p* = .076, partial η² = .05. Post hoc tests showed that positive self-esteem significantly decreased for participants who retrieved a negative self-image, *t*(32) = 8.25, *p* < .001, *r* = .82, whereas positive self-esteem increased after positive self-imagery retrieval, *t*(32) = -5.57, p < .001, *r* = .70.

 **3.3.2 Explicit negative state self-esteem**

 There was a main effect of group, *F*(1,64) = 12.21, *p* = .001, partial η² = .16 and a significant Time x Group interaction, *F*(1.64) = 62.20, *p* < .001, partial η² = .49. There was no main effect of time, *F*(1,64) = 3.35, *p* = .072, partial η² = .05. Negative self-esteem significantly increased after negative self-image retrieval, *t*(32) = -6.18, *p* < .001, *r* = .74, and significantly decreased after positive self-image retrieval, *t*(32) = 4.90, *p* < .001, *r* = .65.

 **3.3.3 Implicit self-esteem**

 Both groups had a positive implicit self-esteem bias as measured by the IAT-D score (see method for details of scoring). There was no difference in implicit self-esteem between the positive (*M* = 0.48, *SD* = 0.31) and negative (*M* = 0.47, *SD* = 0.36) self-imagery groups, *t*(64) = .098, *p* = .922, *r = .*01.

 **3.3.4 State self-concept clarity**

There were no main effects of time, *F*(1,64) = 0.10, *p* = .757, partial η² = .002 or group, *F*(1,64) = 0.37, *p* = .543, partial η² = .006, on state-SCC.However, there was a significant Time x Group interaction, *F*(1,64) = 6.55, *p* = .013, partial η² = .09. State-SCC significantly reduced after negative self-image retrieval, *t*(32) = -2.83, *p* = .008, *r* = .45, but did not change after positive self-image retrieval, *t*(32) = 1.55, *p* = .130, *r* = .26.

**3.4 State Body Satisfaction**

 There were significant main effects of time, *F*(1,64) = 7.24, *p* = .009, partial η² = .10 and group, *F*(1,64) = 26.25, *p* < .001, partial η² = .29, and a significant Time x Group interaction for body satisfaction, *F*(1,64) = 110.30, *p* < .001, partial η² = .63. State body satisfaction significantly increased after positive self-image retrieval, *t*(32) = -7.48, *p* < .001, *r* = .80 and decreased after negative self-image retrieval, *t*(32) = 8.29, *p* < .001, *r* = .83.

* 1. **Affect Measures**

 **3.5.1 State positive affect**

 A mixed ANCOVA indicated that there was a significant main effect of group, *F*(1, 63) = 24.20, *p* < .001, partial η² = .28, a significant Time x Group interaction, *F*(1,63) = 47.51, *p* < .001, partial η² = .43, and a significant main effect of the covariate, *F*(1, 63) = 8.55, *p* = .005, partial η² = .12. There was no main effect of time, *F*(1,64) = 0.57, *p* = .453, partial η² = .01, and no significant Time x Manipulation check interaction, *F*(1,64) = 0.42, *p* = .521, partial η² = .01. Positive affect significantly decreased after the imagery intervention in the negative group, *t*(32) = 6.62, *p* < .001, *r* = .76, but significantly increased in the positive group, *t*(32) = -4.69, *p* < .001, *r* = .64.

 **3.5.2 State negative affect**

 A mixed ANOVA demonstrated significant main effects of group, *F*(1,64) = 5.58, *p* = .021, partial η² = .08, and time, *F*(1,64) = 7.46, *p* = .008, partial η² = .10, and a significant Time x Group interaction, *F*(1, 64) = 33.95, *p* < .001, partial η² = .35. There was a significant increase in negative affect following negative self-image retrieval, *t*(32) = -6.21, *p* < .001, *r* = .74, but no difference after positive self-image retrieval, *t*(32) = 1.78, *p* = .084, *r* = .30.

**4.0 Discussion**

This study had two aims. The first was to explore the effects of negative and positive self-imagery on aspects of the working self in a sample of individuals with high body dissatisfaction. The second was to investigate the impact of these images on state body satisfaction and affect. We found that holding a negative self-image in mind had a negative effect on explicit self-esteem, whereas holding a positive self-image in mind had a beneficial effect on explicit self-esteem. However, there were no differences in implicit self-esteem after the imagery intervention. We also found that holding a negative self-image in mind led to a significant reduction in self-concept clarity; however, there was no effect on state self-concept clarity for positive self-imagery. In terms of the second aim, we found that holding a negative self-image in mind resulted in a decrease in body satisfaction and state affect. The opposite was found for the positive imagery group.

 The results of our study on individuals with body dissatisfaction suggest that there may be several ways in which negative self-imagery could maintain the negative self-views commonly held by individuals with bulimic disorders. Firstly, the repeated activation of a working self, characterised by low self-esteem, is likely to reinforce unconditional negative beliefs about the self (e.g. Cooper, Cohen-Tovee, Todd, Wells, & Tovee, 1997), which in the SMS model could be conceptulaised as part of the stable long-term self.Secondly,the recurrent nature of these negative self-images may produce a negative feedback loop in which the negative self-image and negative working self both represent, and serve as evidence for, the validity of the other (Hulme et al., 2012). Finally, in accordance withBrewin (2006), the repeated activation of these negative working selves is likely to further strengthen their accessibility, which could, in turn, inhibit the retrieval of more positive self-representations that contain contradictory information that could potentially challenge and improve the individual’s self-view.

 The fact that the conscious manipulation of self-imagery retrieval did not affect levels of implicit self-esteem is consistent with the idea that implicit self-esteem is relatively stable and results from automatic, non-conscious self-evaluations (Greenwald & Banaji, 1995), and conflicts with Hulme et al’s (2012) results on the effects of imagery on implicit self-esteem in social anxiety. The discrepancy between the two self-esteem systems found in the negative group is consistent with previous findings (e.g. Cockerham et al, 2009) and also provides insight into the role implicit self-esteem may play in maintaining negative self-views. Discrepancies between low explicit self-esteem and high implicit self-esteem has been termed ‘discrepant low self-esteem’ and may be indicative of psychological distress (Zeigler-Hill, 2006). Such a discrepancy could have a detrimental impact on an individual’s sense of self because it might create uncertainty about the self (Cockerham et al., 2009) and lack of clarity about the self is associated with low self-esteem (Campbell, 1990).

However, despite the argument outlined above, we only found partial support for our hypothesis regarding self-concept clarity. Although negative self-imagery reduced clarity, positive self-imagery did not increase it. It is possible that the retrieval of a negative self-image increases the perceived discrepancy between different versions of the self, as suggested by Higgins’ (1987) self-discrepancy theory. Discrepancies between actual and ideal selves (likely to be important in eating disorders because of the over-evaluation of physical appearance) are likely to cause feelings of uncertainty about the self. Repeated retrieval of negative self-images might lead to a persistent experience of discrepancy between how one would like to be and how one actually is, and thus feed into increased uncertainty about the self. If this were the case, we might have expected a positive self-image to reduce the discrepancy between the actual and ideal self, resulting in an increase in self-concept clarity. However, it is possible that a one-off imagery intervention is not sufficient to facilitate a reduction in this discrepancy and future studies could consider examining the impact of repeated positive self-image retrieval to explore this further. It is also important to note that this finding was in a healthy sample of people with high body dissatisfaction. Future studies exploring self-concept clarity in a clinical population might yield different findings and this is an important area to develop.

The finding that positive and negative self-imagery had a significant impact on levels of state body satisfaction and affect, reflects the potentially far reaching impact of negative self-images; as well as having detrimental effects on aspects of the self-concept, such images may also negatively impact mood and body satisfaction, further maintaining the disorder.

 Despite these findings, this study has a number of limitations that should be noted. Although a strength of this study is that it measured both implicit and explicit self-esteem, implicit self-esteem was not measured at baseline. It is therefore unclear whether participants in each group had comparative levels of implicit self-esteem prior to the intervention, and whether imagery affected this construct. Given that the IAT is a fairly lengthy measure to complete we felt that completing it twice in relatively quick succession might have negative implications for the reliability of any findings. We also acknowledge that there is no consensus over the best measure of implicit self-esteem, that implicit measures are generally poorly correlated and that the IAT used in the current study has only modest test-retest reliability (Bosson et al., 2000). These shortcomings may help account for the conflicting findings in the wider literature. Eating psychopathology was also not measured pre and post the intervention and there was no follow-up to determine whether the positive effects of positive self-imagery were maintained. Despite these limitations, individuals with high body dissatisfaction were able to access a positive self-image, and these images had beneficial effects on self-concept, body satisfaction and affect. Future research which explores whether these findings are replicable in a clinical population, with an assessment of eating psychopathology pre and post the intervention, would help develop this area of research further.

The results suggest that imagery techniques that promote positive self-images may help improve aspects of the self-concept. Brewin (2006) proposes that cognitive therapy works by facilitating access to more positive self-representations, which in turn inhibit access to and challenges the negative self-representations. Furthermore, the finding that positive self-imagery improves explicit self-esteem suggests that this intervention may be one way to effectively reduce the discrepancy between implicit and explicit self-esteem in this population, thereby potentially having a positive impact on self-concept clarity. Imagery can be a powerful way to access positive self-representations and this study supports previous suggestions that imagery focused techniques may constitute a useful clinical tool when working with this clinical group (Tatham, 2011). Although support for the use of imagery interventions with this population comes largely from research demonstrating the effectiveness of imagery re-scripting (Cooper, Todd, & Turner, 2007; Ohanian, 2002), the findings of the present study suggest that the development and rehearsal of a more positive self-image may constitute an additional imagery technique, which can be used to facilitate change at the core belief level.

 Whilst recent advances in eating disorder theory highlight the potential importance of low self-esteem in the maintenance of these disorders (e.g. Fairburn, 2008) the precise mechanisms by which this develops and is maintained has yet to be fully explored. Models such as the SMS (Conway & Pleydell-Pearce, 2000) and Brewin’s (2006) retrieval competition hypothesis offer useful frameworks within which to understand the complex nature of the self and highlight the importance of self-imagery. The findings from the present study suggest that self-imagery techniques, such as positive imagery retrieval, show promise in relation to their potential to facilitate improvement in the clinical features commonly seen in eating disorder patients.

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1. An ANCOVA was used for this analysis for the reasons detailed below. [↑](#footnote-ref-1)
2. Even though there were no correlations between the remaining dependent variables (DVs) and the manipulation measure, ANCOVAs were still run for all measures as an exploratory procedure to ensure the manipulation check did not significantly explain the variation in scores. No significant main effects or interactions were found for the manipulation check in these analyses and thus ANOVAs were used for the main analysis. [↑](#footnote-ref-2)