UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

School of Psychology

Volume I of I

The Role of the Self and Self-Imagery in Eating Disorders

By

Stephanie Farrar

Thesis for the Degree of Doctorate in Clinical Psychology

May 2013

Word count: 20,186

Abstract

The importance of the self-concept in eating disorders has become increasingly more recognised and recent cognitive models have incorporated a central role for self-schemas in the development and maintenance of this disorder (Cooper, Wells, & Todd, 2004; Waller, Kennerley, & Ohanian, 2007). In the first section of this thesis, the literature investigating the role of core beliefs and schema processes in this clinical population is reviewed. Although hampered by methodological weaknesses, in accordance with the models, there is evidence to suggest that self-schemas may influence the development and maintenance of eating disorder symptomology. The importance of incorporating techniques that modify these schema-level beliefs into existing treatment protocols is discussed and preliminary evidence regarding the use of imagery rescripting to modify core beliefs is explored. The findings suggest that imagery interventions may be a powerful way to access and modify the self-concept, and highlight the importance of further exploring the relationship between imagery and the self in this population.

The empirical paper aims to develop current literature by exploring the role of self-imagery in eating disorders. The study investigated the effect of retrieving differently valenced self-images on different aspects of the self-concept (self-esteem and self-concept clarity) in a sample of individuals with high body dissatisfaction. In accordance with the proposal that self-images represent an individual's current working self (Hulme, Hirsch, & Stopa, 2012), holding positive and negative self-images in mind was associated with the retrieval of different self-concepts. Specifically, negative self-imagery retrieval resulted in a decrease in state self-esteem, self-concept clarity, body satisfaction and affect. In comparison, positive imagery retrieval resulted in an improvement in self-esteem, body satisfaction and affect. The potential role of negative self-imagery in the

maintenance of eating disorder pathology and the clinical implications regarding the use of positive self-imagery interventions with this client group are discussed.

Contents

List of Tables

Literature Review

Empirical Paper

List of Figures

Literature Review

Empirical Paper

List of Accompanying Material

Literature Review

Empirical Paper

Declaration of Authorship

I Stephanie Farrar declare that the thesis entitled 'The role of the self and self-imagery in eating disorders' and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- 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;
- where I have consulted the published work of others, this is always clearly attributed;
- 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;
- I have acknowledged all main sources of help;
- 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;
- none of this work has been published before submission.

Signed: ……..

Date:…….

Acknowledgements

Firstly, I would like to thank all the participants who dedicated their time to completing this study. I would like to take this opportunity to express my gratitude to my two supervisors, Dr Lusia Stopa and Dr Hannah Turner, for their continual advice and support throughout this process. I would also like to express special thanks to my fiancé, Oliver, for always being there and for making me laugh when I took things too seriously. Finally, I would like to thank my parents for all their encouragement and also my good friends Philippa Beckwith, Laura Bohane, Rachel Hamblin and Ross Godfree for all their help and support throughout the course.

Literature Review

Self-Schemas in Eating Disorders

Word Count: 10,483

Self-Schemas in Eating Disorders

Historically, cognitive models of eating disorders have primarily focused on cognitions related to food, weight and shape (e.g., negative automatic thoughts, dysfunctional assumptions) to understand and treat the core psychopathology of these disorders (Dingemans, Spinhoven, & van Furth, 2006). Given the modest effectiveness of treatment protocols associated with these early models (e.g., Fairburn et al., 1995), recent models (Cooper, Wells, & Todd, 2004; Waller, Kennerley, & Ohanian, 2007) have incorporated a more central role for the self-concept. Specifically, they draw upon aspects of schema theory (core beliefs and schema processes) to help further understand both the development and maintenance of eating disorder pathology. The increased theoretical and empirical focus on schema level cognitions has also highlighted the importance of developing interventions that can identify and modify these deep set beliefs. The effectiveness of imagery-based interventions with this client group represents one area that has recently received attention.

In accordance with these theoretical developments, this review has two main aims. Firstly, to provide an overview of the proposed role of schemas in recent cognitive models of eating disorders and secondly, to review the empirical evidence regarding the role of schema level beliefs in individuals with eating disorders. The clinical implications of this research will then be discussed, focusing on the use of imagery interventions with this client group. Before discussing the models in this area, the key terms used in this review will be defined.

Definition of Terms

Eating Disorders

There are four eating disorders commonly seen in adults: Anorexia Nervosa (AN), Bulimia Nervosa (BN), 'Eating Disorder Not Otherwise Specified' (EDNOS) and Binge Eating Disorder (BED; APA, 2012). Although there are a number of recognised eating disorders, the majority of research concentrates on AN and BN and therefore these two diagnostic categories will be the focus of this review. AN and BN are characterised by a fear of gaining weight, and disturbed eating behaviour is a hallmark of both disorders (Hoek & van Hoeken, 2003). AN involves a refusal to maintain a healthy body weight through the restriction of dietary intake, and BN is characterised by a cycle of dieting, binge-eating and compensatory behaviour (e.g., vomiting) to prevent weight gain.

The Self-Concept

The self-concept is a dynamic, multidimensional construct made up of beliefs, attitudes and feelings towards the self (Markus & Wurf, 1987). Although the self is difficult to conceptualise and has been defined in many ways, one of the principal ways in which the self is represented in cognitive models of both Axis I and II disorders is through the concept of self-schemas (Stopa, 2009). The term 'schema' is used inconsistently in the cognitive literature and thus is difficult to define. To add clarity to the review, the definition and theory proposed by Young, Klosko and Weishaar (2003) will be outlined and then the differing terms used in the eating disorder field will be discussed.

Early maladaptive schemas (EMSs) develop in childhood as a result of negative interactions or experiences with significant others and act as a template for processing and defining later behaviours, thoughts, feelings, and relationships. They are pervasive

themes in thinking about oneself and one's relationships and when activated are comprised of memories, bodily sensations, emotions and cognitions (Young et al., 2003).

Individuals develop maladaptive coping styles in order to adapt to schemas so they do not have to experience the intense, overwhelming emotions that schema activation usually engenders (Young et al., 2003). Although coping styles can help avoid the activation of schemas, the underlying schema(s) does not change, and therefore these maladaptive coping styles contribute to schema maintenance. Young et al. (2003) identifies three coping strategies: compensation, avoidance and surrender. Schema compensation is where one thinks or behaves in complete opposition to what an underlying negative schema would suggest. Schema avoidance is when individuals avoid thinking about the schema or avoid situations which are likely to activate the schema and related affect. Additionally, when feelings related to the schema do emerge, individuals often use strategies such as overeating and alcohol to avoid these emotions. In contrast to the above two strategies, schema surrender is where one thinks or behaves in line with an underlying schema. Individuals accept that the schema is true and therefore experience the emotions associated with it (Young et al., 2003).

As mentioned above, the cognitive literature is inconsistent in its use of schema terminology. The most noticeable of these is that the terms 'schema' and 'core belief' are often used interchangeably (Cooper, 2009). However, Beck, Freeman and Associates (1990) make a distinction between these two concepts and define 'schemas' as the cognitive structures that organise experience and behaviour and 'core beliefs' (beliefs about the self, others and the world) as the cognitive content of these schemas. The eating disorder literature reviewed in this paper adopts this distinction and uses measures of core beliefs to explore the content of schemas in this population. This review therefore uses core beliefs to reflect the cognitive content of schemas. Confusingly, the eating disorder

literature also refers to Young and colleagues' (2003) concept of 'coping strategies' as 'schema processes' (e.g., Waller, Kennerley, et al., 2007). The latter term will therefore be used in this review.

The Role of Core Beliefs and Schema Processes in Eating Disorders: Theoretical Models

Self-esteem is an aspect of the self-concept which has historically received the most theoretical and empirical attention in the eating disorder population. Individuals with AN and BN judge themselves largely in terms of their eating habits, shape and weight and their ability to maintain control over these elements (Fairburn, Cooper, & Shafran, 2003). How patients feel and think about their body consequently affects their self-esteem (Cooper, 2009). The importance of weight and shape based self-esteem has been widely researched (e.g., Geller et al., 1998) and is recognised as a key maintenance factor in cognitive models (e.g., Fairburn et al., 2003). Eating disorders are also often characterised by a general negative sense of self (Cooper, 2009); however, with the exception of Vitousek and Hollon (1990), who proposed that self-schemas are an important construct in the development of eating disorders, little attention has been paid to the self as a broader construct in theoretical models. One reason for this is that earlier models have primarily focused on maintenance rather than developmental factors (Cooper, 2005).

More recently this gap has been addressed and there are now two models of eating disorders (Cooper et al., 2004; Waller, Kennerley, et al., 2007) which draw upon the principles of schema theory to give the self a more prominent role in both the development and maintenance of the disorders. Cooper et al. (2004) have adopted a framework which conceptualises the self in terms of schema content and process in order to help understand the factors involved in the development and maintenance of BN. In contrast, Waller, Kennerley, et al. (2007) specifically draw upon schema processes to explain the differences in AN and BN symptomology. These two models will now be briefly outlined.

A Cognitive Model of Bulimia Nervosa (Cooper et al., 2004)

The developmental aspect of Cooper et al's. (2004) model (Figure 1) proposes that negative self-beliefs (e.g., I am unlikable) and underlying assumptions about weight, shape and eating (e.g., If I lose weight, others will like me) are important in the development of the disorder (Cooper, 2005). More specifically, they propose that negative or traumatic early childhood experiences give rise to negative self-beliefs and consequently schema compensation strategies (reflected in underlying assumptions), such as dieting, develop as a way to cope with these beliefs (Cooper et al., 2004). A difficulty with this aspect of the model is that dieting does not completely meet Young and colleagues' (2003) definition of schema compensation (i.e. it is not the opposite of what one would expect from knowledge of the schema). However, Cooper et al. (2004) acknowledge this and argue that, in line with the definition, it does become dysfunctional and is not what would be expected given the underlying schema. They therefore conclude that it can be regarded as a compensatory strategy (Cooper et al., 2004). Nonetheless, the lack of explanation regarding how dieting has a compensatory function and also what other cognitions or behaviours may constitute a compensation strategy is a relative weakness of this model because the exact role of these processes are not clearly defined.

The maintenance aspect of the model predicts that episodes of bingeing are preceded by the activation of negative beliefs about the self. Precipitating factors in the individual's life (e.g., remarks about weight) trigger negative self-beliefs, which subsequently activate negative automatic thoughts, leading to increased distress and the onset of a vicious cycle maintaining binge-eating and compensatory behaviours (Cooper et al., 2004). Cooper et al. (2004) propose that the onset of emotion following the activation of negative automatic thoughts triggers both positive (e.g., eating will help reduce negative thoughts/feelings) and negative (e.g., I'll get fat) beliefs about eating.

This dissonance between the two sets of conflicting beliefs is resolved by permissive thoughts/thoughts of no control (e.g., one more piece won't hurt/I can't stop eating). Once these have been activated, eating takes place. This is followed by negative self-appraisals and associated negative emotions, which activates negative beliefs about eating once more, thus completing the vicious cycle. At the same time, also contributing to the maintenance of the vicious cycle, eating distracts from emotion, causing changes in cognition as well as changes in interoception (particularly hunger and satiety). Purging results when the cognitive and physiological effects of binge-eating take hold; negative beliefs about eating now become dominant over positive beliefs and the individual switches from eating to purging and other compensatory behaviours (Cooper et al., 2004).

A strength of this model is that it accounts for the different levels of cognition involved in eating disorders and provides insight into the factors that led to the development of the disorder. However, another limitation of the model is that the authors only refer to negative self-beliefs. Cognitive theory highlights the importance of beliefs about the self, world and others in clinical disorders (Padesky & Greensberger, 1995), and thus the model does not include the full range of core beliefs. Additionally, the model is only applicable to BN and therefore does not advance our understanding regarding the deeper level cognitions involved in AN.

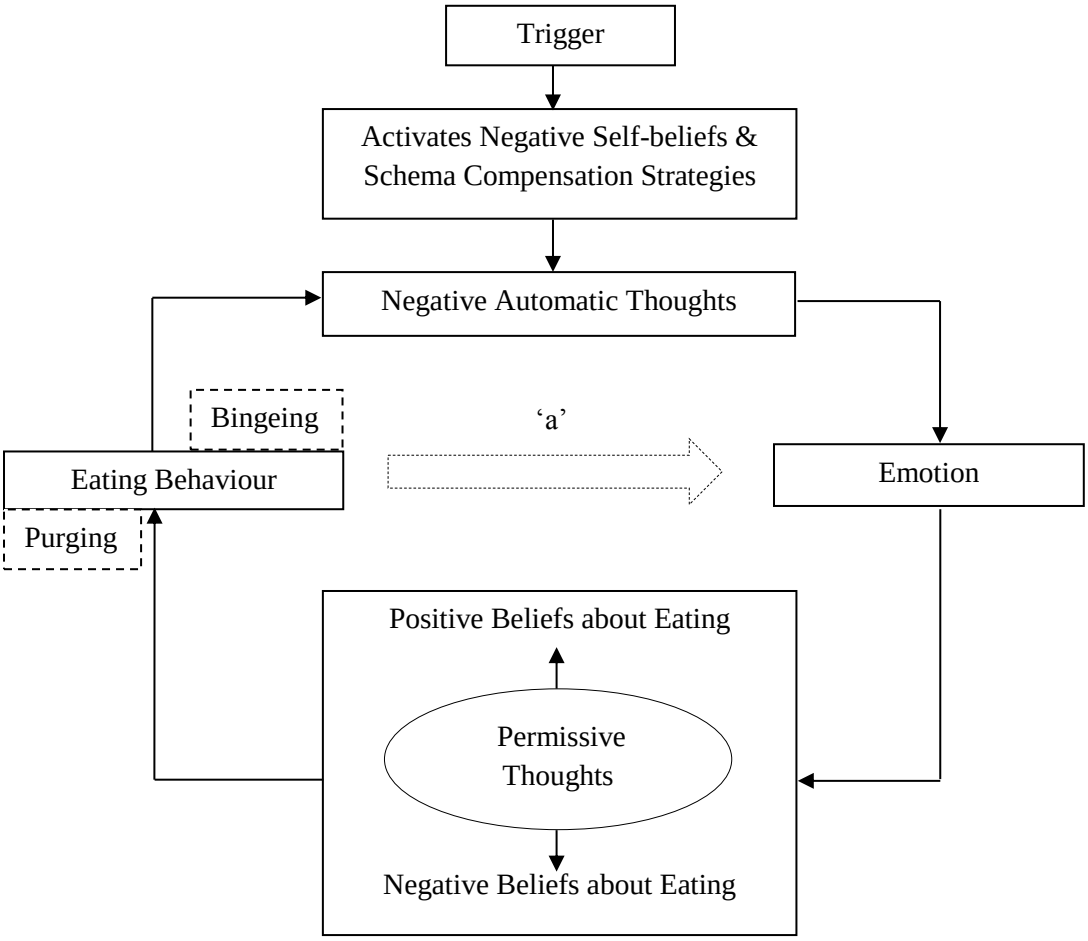


Figure 1. A Cognitive Model of Bulimia Nervosa. 'a' = Distracting effects of eating on emotional intensity and direct physiological effects on feeling states/interoception. Adapted from "A cognitive model of bulimia nervosa," by M. Cooper, A. Wells, and G. Todd, 2004, *British Journal of Clinical Psychology, 43,* p.7.

Schema-Based Cognitive-Behavioural Model of Eating Disorders (SBCB; Waller, Kennerley, et al., 2007)

Waller, Kennerley, et al. (2007) propose that schema content (core beliefs) does not differ between AN and BN. They have therefore developed a model which suggests that what differentiates the development of anorexic and bulimic pathologies is largely to

do with schema processes rather than the underlying core beliefs. The model suggests that although schema compensation and avoidance both serve the function of affect regulation, the key difference between AN and BN is the point in the cognition-emotion-behaviour chain that the individual makes an effort to reduce the experience of an intolerable emotional state (Waller, Kennerley, et al., 2007)[1].

In addition to adopting the term 'schema processes' as opposed to 'coping strategies', the authors also use two different terms to denote schema compensation and schema avoidance. They propose that AN is associated with primary avoidance of affect (analogous to schema compensation), and BN is associated with secondary avoidance of affect (analogous to schema avoidance).

Restrictive behaviour[2] is proposed to achieve primary avoidance of negative affect (avoiding the possibility of negative affect being triggered in the first place) through the process of schema compensation. For example, the compensatory schema of 'unrelenting standards' (perfectionism) might be activated in order to reduce the risk of triggering the 'failure to achieve' schema. The resulting perfectionist behaviour can manifest in a number of ways, including restrictive eating, compulsive exercise or obsessive-compulsive behaviours (Waller, Cordery, et al., 2007). In contrast, bulimic behaviour is more characteristic of secondary avoidance of negative affect (reducing the experience of affect once it has been experienced) which is achieved through a process of schema avoidance. Individuals may avoid the activation of emotional states, but then employ behaviours to block these emotions when they become too powerful (Waller, Kennerley, et al., 2007). For example, individuals may employ strategies such as bingeing to block or

[1] Schema surrender is proposed to be characteristic of both disorders and thus is not specifically incorporated into the model.

[2] The term restrictive behaviour refers to the restriction of food intake commonly seen in AN.

reduce distressing cognitions/emotions (e.g., loneliness) that have been triggered by the activation of a schema (e.g., abandonment schema). Individuals with AN may also use schema avoidance when the triggering of compensatory schemas is not sufficient to prevent primary avoidance of affect (Waller, Kennerley, et al., 2007). In accordance with Young et al. (2003), these processes are proposed to maintain the disorder because although they have the short-term benefit of reducing the likelihood that core beliefs will be triggered, thus reducing the high levels of aversive emotion associated with that belief, such avoidance maintains core beliefs in the long-term because they are never challenged (Waller, Kennerley, et al., 2007).

In contrast to the model proposed by Cooper et al. (2004), this model aims to understand both AN and BN pathology and can accommodate for the comorbidity of restrictive and bulimic cognitions and behaviour. The model was also designed to supplement existing models commonly used in clinical practice (e.g., transdiagnostic model; Fairburn et al., 2003) to help conceptualise cases that are resistant to change and thus may benefit from a deeper schema-based approach (Waller, Kennerley, et al., 2007). This is a strength of the model because it does not compete with existing frameworks, but instead aims to enhance clinical practice and acknowledges that schema level cognitions may not always be an essential target in treatment.

Together, these two models (Cooper et al., 2004; Waller, Kennerley, et al., 2007) predict that core beliefs and schema processes have an important role in the development and maintenance of eating disorders. In the following section, empirical research investigating this proposal is reviewed.

Empirical Review: The Role of Core Beliefs and Schema Processes in Eating Disorders

Search Strategy

This review is based upon a systematic search of published articles available from 1916 up to December 2012. To identify relevant articles a search was conducted on the following online databases: PsycINFO, PsycARTICLES, Medline, CINAHL plus full text and Web of Knowledge. Articles containing any combination of the following search terms were retrieved: schema*, self-schema*, schema content, core belief*, negative self-belief* schema process* AND eating disorder (exploded term - included AN, BN, BED, EDNOS).

Titles and abstracts of identified articles were screened for the following inclusion criteria: 1. the article reported results of an empirical study; 2. the study was related to core beliefs and schema processes; 3. the study sampled adolescents or adults diagnosed with an eating disorder characterised by concerns regarding eating, shape and weight (AN, BN or EDNOS). Review articles and theoretical papers were excluded from the systematic search; however, reference is made to them to inform the argument where appropriate. The search process produced 30 empirical articles which are included in this review. A diagram detailing the systematic search process is included in Appendix A.

The relevant methodological details of the studies retrieved are detailed in Tables 1 and 2. In order to determine whether schema level cognitions have an important role in the development and maintenance of eating disorders, this section firstly reviews what is known about the role of core beliefs in eating disorders and then moves onto the role of schema processes in this population. After this, the clinical implications of this research are discussed.

Table 1

Characteristics of the Twenty-Three Studies Retrieved on Core Beliefs in Eating Disorders

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Core Belief Measure	Additional Outcome Measure(s)	Outcome	Controlled for Depression?
Bradford & Rutherford (2001)	Cross-sectional questionnaire	AN	40	Non-dieting controls	12	Eating Disorder Belief Questionnaire (EDBQ)	n/a	Individuals with AN scored significantly higher than controls on all four subscales.	No
Cooper & Cowen (2009)	Cross-sectional questionnaire	Individuals with an ED	53	Individuals with depression Non-clinical control	45 73	Eating Disorder-Core Belief Questionnaire (ED-CBQ)	n/a	Individuals with eating disorders scored higher on the 'repelled by self' core belief subscale than those with depression.	Yes
Cooper & Hunt (1998)	Cross-sectional questionnaire	BN	12	Individuals with depression Non-eating disorder controls	12 18	EDBQ	n/a	No difference between BN and depressed group on EDBQ-negative self-belief subscale (EDBQ-NSBS).	Yes
Cooper & Turner (2000)	Cross-sectional questionnaire	AN	18	Dieting Controls Non-dieting controls	18 18	EDBQ	n/a	Individuals with AN scored higher than dieting and non-dieting controls on the EDBQ-NSBS.	No
Cooper et al. (1997)	Cross-sectional questionnaire	AN BN	12 12	Non-dieting controls	12	EDBQ	n/a	The two patient groups scored significantly higher than the control group on the EDBQ.	No
Cooper et al. (1998)	Semi-structured interview	AN BN	12 12	Non-eating disorder controls	12	Interview	n/a	Individuals with AN and BN report negative self-beliefs. All patients believed that dieting was a way to counter the negative implications associated with negative self-beliefs.	No

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Core Belief Measure	Additional Outcome Measure(s)	Outcome	Controlled for Depression?
Dingemans et al. (2006)	Cross-sectional questionnaire	RAN BPAN BN BED	16 31 23 36	Healthy Control	27	Young Schema Questionnaire (YSQ)	Bulimic Investigatory Test Edinborough (BITE)	Individuals with AN and BN had significantly more negative core beliefs than healthy controls. No difference between AN and BN subgroups on core belief scores. No correlation between core beliefs and frequency of binge eating. Frequency of purging and fasting behaviour is associated with more severe maladaptive core beliefs.	No
Fairchild & Cooper (2010)	Cross-sectional questionnaire	Non-clinical sample	500	n/a	n/a	ED-CBQ	n/a	Core beliefs characterized by 'self-loathing' were associated with putative eating disorders diagnosis. Core beliefs characterised by 'abandonment/deprivation' were associated with putative depression/anxiety diagnosis.	Yes
Hinrichsen et al. (2007)	Semi-structured interview and cross-sectional questionnaire	BN BPAN EDNOS	22 4 4	n/a	n/a	The Schema Identification Scale for Clients with Eating Disorders (SIS-ED)	n/a	Individuals reported experiencing 'defectiveness/shame, failure, and social isolation' core beliefs and recurrent negative images (linked to adverse life experiences) prior to vomiting.	No
Jones et al. (2005)	Cross-sectional questionnaire	Individuals with eating disorder	66	Recovered individuals Non-eating disorder controls	29 50	YSQ	Eating Disorder Inventory (EDI)	Individuals with an eating disorder scored significantly higher than recovered individuals on the majority of core beliefs. Bulimic attitudes and behaviour are associated with core beliefs.	No

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Core Belief Measure	Additional Outcome Measure(s)	Outcome	Controlled for Depression?
Lawson et al. (2008)	Cross-sectional questionnaire	AN BN EDNOS	11 21 38	n/a	n/a	YSQ	Toronto Alexithymia Scale (TAS-20)	Difficulties in identifying emotions were associated with 'entitlement' beliefs. Difficulties in describing emotions were associated with 'abandonment and emotional inhibition' beliefs.	No
Leung et al. (1999)	Cross-sectional questionnaire	AN BN	30 27	Non-eating disordered women	23	YSQ	Mizes Anorectic Cognition Scale (MAC) Self-reported frequency of bingeing and purging behaviour	AN and BN women had significantly higher levels of core beliefs than controls. Clinical groups only differed on one core belief – entitlement. Frequency of bingeing is negatively correlated with 'social undesirability' core belief. Frequency of vomiting is positively correlated with 'failure to achieve' core belief.	No
Leung et al. (2000)	Cross-sectional group treatment outcome study	BN	20	n/a	n/a	YSQ	Bulimia Test-Revised MAC	Treatment outcome was associated with pre-treatment levels of pathological core beliefs.	No
Leung & Price (2007)	Cross-sectional questionnaire	AN BN	16 19	Symptomatic Dieters Normal Dieters	16 39	YSQ	n/a	Individuals with eating disorders scored higher on 8 out of 15 core beliefs than symptomatic dieters.	Yes
Turner & Cooper (2002)	Semi-structured interview	AN	18	Normal Dieters Non-Dieters	18 18	EDBQ	n/a	Clinical population reported significantly more negative self-beliefs than dieters and controls. Dieters reported significantly more negative self-beliefs than controls.	No

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Core Belief Measure	Additional Outcome Measure(s)	Outcome	Controlled for Depression?
Unoka et al. (2007)	Cross-sectional questionnaire	RAN BPAN BN	35 30 49	n/a	n/a	YSQ	Body Mass Index (BMI)	Eating disorder subgroups differed in terms of their core belief profiles. Low BMI is associated with high scores on 'defectiveness, failure, dependence, enmeshment, subjugation and approval-seeking' core beliefs.	No
Unoka et al. (2010)	Cross-sectional questionnaire	RAN BPAN BN	35 30 49	n/a	n/a	YSQ	Eating Disorder Symptom Severity Scale (EDS3)	Individuals with BPAN scored higher than RAN and BN on all YSQ core beliefs. Diet pill and laxative usage are associated with different patterns of core beliefs.	No
Waller (2003)	Cross-sectional questionnaire	BED BN	25 25	Non-eating disorder control	25	YSQ	n/a	There are differences between the core beliefs characteristic of BN and BED.	No
Waller et al. (2002)	Cross-sectional questionnaire	BN BPAN BED	45 17 13	n/a	n/a	YSQ	EDI	Bulimic attitudes and behaviour are associated with 'emotional deprivation, social isolation and insufficient self-control' beliefs. Restrictive behavior is associated with 'dependence/incompetence' and 'emotional inhibition' beliefs.	No
Waller, Meyer, et al. (2001)	Cross-sectional questionnaire	BN BPAN BED	41 11 9	n/a	n/a	YSQ	Self-reported frequency of bingeing and purging behavior	Frequency of bingeing and purging behaviours are associated with different patterns of core beliefs.	No
Waller et al. (2000)	Cross-sectional questionnaire	BN BPAN BED	28 12 10	n/a	n/a	YSQ	Self-reported frequency of bingeing and purging behaviour	The three BN subgroups could be differentiated by their scores on three core beliefs. 'Emotional inhibition' core beliefs predicted severity of bingeing. 'Defectiveness/shame' core beliefs predicted severity of vomiting.	No

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Core Belief Measure	Additional Outcome Measure(s)	Outcome	Controlled for Depression?
Waller, Shah, et al. (2001)	Cross-sectional questionnaire	BN with no depression BN with mild depression BN with moderate-severe depression	26 17 31	Individuals with depression Non-clinical volunteers	18 45	YSQ	n/a	Individuals with BN and individuals with depression can be differentiated by the levels of core beliefs they hold.	Yes
Woolrich et al., (2006)	Semi-structured interview	AN	15	Dieting Controls Non-dieting Controls	17 18	Interview	n/a	Individuals with AN report more negative core beliefs than controls. These beliefs were associated with negative early life experiences. Individuals with AN report using specific behaviours to reduce the impact of negative self-beliefs.	No

Notes. RAN = Restrictive Anorexia Nervosa, BPAN = Anorexia Nervosa of the Binge-Purge Subtype. Eating Disorder Belief Questionnaire (EDBQ; Cooper, Cohen-Tovee, Todd, Wells, & Tovee, 1997), Eating Dsiorder-Core Belief Questionniare (ED-CBQ; Cooper & Cowen, 2009), Young Schema Questionnaire (YSQ; Young, 1990), Schema Identification Scale for Clients with Eating Disorders (SIS-ED; Adapted from Bricker & Young [1994] and Young [1999] for the purposes of the study), Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983), Mizes Anorectic Cognition Scale (MAC; Mizes & Klesges, 1989), Bulimic Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991), Eating Disorder Symptom Severity Scale (EDS3; Henderson et al, 2010), Bulimic Investigatory Test Edinborough (BITE; Henderson & Freeman, 1987), Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994).

Table 2

Characteristics of the Seven Studies Retrieved on Schema Processes in Eating Disorders

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Schema Process Measure	Core belief/ Alternative measures	Outcome
Boone et al. (2013)	Cross-sectional questionnaire	AN BPAN BN EDNOS	35 13 19 21	n/a	n/a	n/a	The Multi-dimensional Perfectionism Scale (F-MPS) YSQ The Body Attitude Test (BAT)	Found links between core beliefs and perfectionism. Perfectionism was found to significantly mediate the relationship between schema domains and body image concerns.
Gongora et al. (2004)	Cross-sectional questionnaire	BN	70	n/a	n/a	n/a	YSQ MAC EDI	Relationships found between core beliefs and specific cognitions regarding weight, shape and eating were found.
Hughes et al. (2006)	Cross-sectional questionnaire	AN BN EDNOS	59 52 40	n/a	n/a	n/a	Eating Disorders Examination Questionnaire (EDE-Q) YSQ	Binge frequency was predicted by both disorder-specific and core beliefs separately. Disorder-specific cognitions only predicted the behavioural manifestations of BMI and vomiting in the presence of unhealthy core beliefs.
Luck et al. (2005)	Cross-sectional questionnaire	AN BPAN BN	43 28 50	Non-clinical controls	337	Young Compensation Inventory (YCI) Young-Rygh Avoidance Inventory (YRAI)	n/a	Primary and secondary avoidance of affect was found in the AN group and secondary avoidance of affect was characteristic of individuals with BN.

Study	Design	Clinical Sample	N	Comparison sample(s)	N	Schema Process Measure	Core belief/ Alternative measures	Outcome
Mountford et al. (2004)	Experimental computer-based task	AN BN	19 20	Non-clinical controls	20	Experimental task measuring schema compensation	n/a	Little evidence of schema compensation in the AN group.
Sheffield et al. (2009)	Cross-sectional questionnaire	AN BPAN BN EDNOS-purging EDNOS-restrictive BED	24 17 41 12 20 10	Non-clinical controls	353	YCI YRAI	Young Parenting Inventory-Revised (YPI-R) EDI	In both groups, schema processes were partial mediators of the relationship between parenting experiences and eating pathology. In the clinical group, behavioural-somatic avoidance partially mediated the relationship between emotionally inhibited mothers and body dissatisfaction.
Spranger et al. (2001)	Cross-sectional questionnaire	BN BPAN BED	11 6 2	Non-clinical controls	74	YRAI	n/a	Individuals with BN reported significantly higher levels of schema avoidance than controls. Individuals with BN with higher levels eating pathology were less likely to use schema avoidance methods.

Notes. Young Compensation Inventory (YCI; Young, 1995), Young-Rygh Avoidance Inventory (YRAI; Young & Rygh, 1994), Young Parenting Inventory-Revised (YPI-R; Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005), The Multi-dimensional Perfectionism Scale (F-MPS; Frost, Marten, Lahart, & Rosenblate, 1990), The Body Attitude Test (BAT; Probst, Van Coppenolle, & Vandereycken, 1995), Eating Disorders Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994).

Role of Core Beliefs in Eating Disorders

Assessment of Core Beliefs

The majority (18 of 23) of studies investigating the role of core beliefs have utilised one of two measures. The key details and limitations of these will be briefly reviewed to aid interpretation of the literature. Thirteen studies in this review have used either the long or short version of the Young Schema Questionnaire (YSQ; Young, 1990). The long version is a 205-item self-report questionnaire designed to measure the following 16 EMSs: Abandonment, Defectiveness/Shame, Functional Dependence, Emotional Deprivation, Emotional Inhibition, Enmeshment, Entitlement, Failure to Achieve, Insufficient Self-Control, Mistrust/Abuse, Self-Sacrifice, Social Isolation, Social Undesirability, Subjugation, Unrelenting Standards and Vulnerability to Harm. The shorter version consists of 75-items measuring 15 (social undesirability removed) of the EMSs. It is important to note that although the YSQ is presented as a measure of EMSs, it only measures the cognitive content of schemas (core beliefs); not the emotional, physiological and motivational elements which also make up these constructs (van Vreeswijk, Broersen, & Nadort, 2012). In accordance with this, studies in this review use the YSQ as a measure of core beliefs.

Since the development of this measure, Young et al. (2003) have acknowledged that five of the subscales better reflect conditional schemas (subjugation, self-sacrifice, emotional inhibition, unrelenting standards and approval seeking). These are analogous to underlying assumptions (Beck, Rush, Shaw, & Emery, 1979), and develop to get relief from unconditional schemas. The model proposed by Waller, Kennerley, et al. (2007) also adopts this view and refers to these conditional schemas as ‘compensatory schemas’ (which individuals with AN employ to avoid the activation of core schemas/beliefs). Empirical research in the eating disorders field has not made this distinction and therefore

studies using the YSQ as a measure of core beliefs will be reviewed under this section to maximise clarity. However, it should be noted that some of the findings may reflect potential schema processes employed by individuals with eating disorders and reference to these will be made in the process section.

The second measure is the Eating Disorder Belief Questionnaire (EDBQ; Cooper, Cohen-Tovee, Todd, Wells, & Tovee, 1997). Five studies have used the EDBQ, which is a 32-item self-report questionnaire designed to assess underlying assumptions and negative self-beliefs associated with eating disorders (Bradford & Rutherford, 2001). The negative self-beliefs subscale consists of ten items and is used to measure core beliefs in this population.

Both measures have acceptable psychometric properties with eating disorder populations (Waller, Meyer, & Ohanian, 2001; Cooper et al., 1997 respectively). Although the use of well validated and standardised measures is recommended in research, a limitation of the YSQ is that it was not developed specifically to investigate core beliefs in eating disorders and therefore it is questionable whether it is accessing the beliefs specific to this population. A strength of the EDBQ is that it was designed for this clinical population, however, it has been criticised for being too brief (Fairchild & Cooper, 2010) and thus again suffers from the same shortcoming. Additionally, the same beliefs are not measured by each questionnaire and therefore it is difficult to make meaningful comparisons across studies. Unfortunately, the high reliance on self-report measures means that the research reviewed in this section lacks originality, and some areas are hampered by inconsistent results which preclude firm conclusions being drawn.

Core Beliefs and Eating Disorder Psychopathology

In accordance with the models, research utilising a variety of different comparison groups has found that negative core beliefs are characteristic of individuals with eating disorders. Four studies (Bradford & Rutherford, 2001; Cooper et al., 1997; Dingemans et al., 2006; Leung, Waller, & Thomas, 1999) utilising non-clinical control groups have reported a relationship between core beliefs and eating disorder psychopathology. Cooper et al. (1997) compared twenty-four outpatients with either AN or BN to twelve healthy controls. Both clinical groups scored significantly higher on the negative self-belief subscale of the EDBQ (EDBQ-NSBS) than controls. In a larger study, Bradford and Rutherford (2001) also found this pattern of results with forty adolescent inpatients with AN. Similarly, two studies employing the YSQ found that both AN and BN patients have higher levels of unhealthy core beliefs than non-clinical controls on all subscales (Dingemans et al., 2006) except entitlement (Leung et al., 1999). However, a weakness of these studies is that non-clinical control groups do not provide insight into whether core beliefs play a key role in the development and maintenance of eating disorders.

To address this shortcoming, four studies (Cooper & Turner, 2000; Leung & Price, 2007; Turner & Cooper, 2002; Woolrich, Cooper, & Turner, 2006) have used female dieters as a control group. Dieters share many of the beliefs and concerns related to eating, weight and shape as eating disorder patients but do not meet the diagnostic criteria. Therefore, if clinical populations score higher on measures of core beliefs than dieters, this suggests these beliefs have a role in the aetiology of the disorder (Woolrich et al., 2006). A study comparing individuals with AN (n =16) and BN (n =19) to 16 symptomatic dieters[3] found the former scored higher on eight of the fifteen[4] YSQ core

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

beliefs (Leung & Price, 2007). Considering the two groups did not differ on the severity of some eating symptoms, these results support the assertion that the core beliefs of women with and without an eating disorder are fundamentally different. It also suggests these beliefs may contribute to the development of the disorder (Leung & Price, 2007). Cooper and Turner (2000) also found that individuals with AN scored higher than dieters on the EDBQ-NSBS, further suggesting that the absence of dysfunctional core beliefs in dieters may help explain the absence of a clinical disorder. Unfortunately, both studies only recruited small sample sizes and therefore need replicating with larger populations before firm conclusions can be made (Leung & Price, 2007).

Two studies (Turner & Cooper, 2002; Woolrich et al., 2006), which utilised semi-structured interviews, further corroborate the proposal that core beliefs may have a role in the development of AN. In both studies, individuals with AN were asked to think about the last time they felt worried or bad about their eating, and then the authors used the downward arrow technique to identify core beliefs. Individuals with AN reported significantly more negative self-beliefs than dieters and non-dieters during this interview (Turner & Cooper, 2002; Woolrich et al., 2006). Turner and Cooper (2002) also found that dieters reported more negative self-beliefs than controls, thus suggesting the presence of such beliefs may constitute a risk factor for developing the disorder. A strength of these two studies is that semi-structured interviews allow for the emergence of idiosyncratic and novel data that may not be captured by self-report measures. In support of this point, Woolrich et al. (2006) found that beliefs in the clinical group were characterised by themes of powerlessness, defectiveness and failure. Neither the YSQ nor

[4] Clinical group scored higher than symptomatic dieters on the following beliefs: emotional deprivation, mistrust/abuse, social isolation, defectiveness/shame, failure to achieve, functional dependence, vulnerability to harm and subjugation.

the EDBQ measure 'powerlessness' and therefore, as stated before, it is questionable whether pre-determined measures are accessing the key beliefs characteristic of this population. Although the use of semi-structured interviews is a welcome alternative to self-report measures in this area of research, they still rely on retrospective reporting and the interviewer in the study conducted by Woolrich et al. (2006) was not blind to the hypothesis which reduces the reliability of the results.

In addition to the importance of core beliefs in the development of eating disorders, Cooper et al. (2004) also propose that these beliefs play a role in the maintenance of eating disorders. A study conducted by Jones, Harris and Leung (2005) provides support for this prediction. They compared sixty-six women suffering from an eating disorder to twenty-nine women who had recovered, and found that the former scored higher on five of the YSQ beliefs (dependence, enmeshment, subjugation, emotional inhibition and unrelenting standards) than the latter. These results suggest that these beliefs may have a role in the maintenance of the disorder. Additionally, the recovered group scored higher on five of the core beliefs than controls. This suggests that although less dysfunctional beliefs appear to be related to eating disorder recovery, women who have recovered from this disorder retain more negative core beliefs than women without this disorder, and thus core beliefs may constitute a risk factor for relapse (Jones et al., 2005). While this study provides further insight into the potential role of core beliefs in this population, the participants self-reported their eating disorder status and thus the reliability of the differences found between groups is questionable (Jones et al., 2005).

Although there is evidence to suggest that core beliefs are characteristic of individuals with eating disorders, with the exception of Leung and Price (2007), none of the above studies adequately controlled for the effect of comorbid disorders such as

depression. Consequently it is unclear whether the patterns of core beliefs found are specific to eating disorder symptoms or better reflect the presence of depressive symptomology. To address this shortcoming, four studies (Cooper & Cowen, 2009; Cooper & Hunt, 1998; Fairchild & Cooper, 2010; Waller, Shah, Ohanian, & Elliott, 2001) have investigated whether individuals with eating disorders can be discriminated from those with depression through their core beliefs.

One of the earlier studies in this area concluded that there was no difference in scores on the EDBQ-NSBS between individuals with BN and individuals with depression (Cooper & Hunt, 1998). However, the failure to find a difference may have been due to the two groups reporting equivalent levels of depression. To overcome this difficulty, Waller, Shah, et al. (2001) divided women with BN into different subgroups based on their levels of comorbid depression. They found that although both participants with BN (with or without depression) and participants with major depressive disorder had broadly similar levels of core beliefs on the YSQ, the two groups could be differentiated in that individuals with BN scored higher on the failure to achieve belief.

More recently, two exploratory studies with clinical and non-clinical populations (Cooper & Cowen, 2009; Fairchild & Cooper, 2010 respectively) used a new measure of core beliefs to investigate this relationship. The Eating Disorder Core Belief Questionnaire (ED-CBQ) is a multi-dimensional version of the EDBQ-NSBS which measures forty potential core beliefs about the self. This measure therefore improves on the shortcomings of the EDBQ previously mentioned. Both studies found that individuals with an eating disorder and depressive symptoms could be distinguished from those with major depression by their negative core beliefs when using this scale. Consistent with clinical observations, the eating disorder group had significantly higher scores on the ‘repelled by self’ (Cooper & Cowen, 2009) and the ‘self-loathing’ subscales whilst

depression and anxiety were most strongly associated with the 'abandonment/deprived' subscale (Fairchild & Cooper, 2010). Although exploratory, the subscale themes identified by the factor analyses in both studies were similar and the measure had adequate internal consistency and construct validity (Fairchild & Cooper, 2010). Together, these results suggest that although there appears to be an overlap between core beliefs present in eating disorders and depression (which is likely to be due to their shared psychopathology), there are differences in their respective profiles, indicating that eating disorders may be associated with specific beliefs (Fairchild & Cooper, 2010). The use of a measure specifically designed to assess core beliefs in individuals with eating disorders is a great strength of these two studies and the consistency between the findings also suggest that core beliefs characterised by themes of 'self-loathing' and 'repelled by self' may have a key role in the development and maintenance of the disorder, and thus be a useful target for treatment. However, these findings need to be replicated and the ED-CBQ still only measures self-beliefs and therefore cannot be considered a comprehensive measure of core beliefs.

Collectively, research in this area so far demonstrates that negative core beliefs are characteristic of individuals with eating disorders and, in accordance with the theoretical models, there is some evidence to suggest that they have a role in both the development and maintenance of the disorder (Cooper, 2005). However, in addition to the weaknesses outlined above, research has largely focused on women with AN or BN. Little is therefore known about the role of core beliefs in men and in individuals who fail to meet the full criteria for AN or BN (e.g., EDNOS) (Waller, Kennerley, et al., 2007). Finally, although there is evidence to suggest the profile of core beliefs may be distinct to that of other disorders, the research reviewed above does not tell us whether specific beliefs are characteristic of the different eating disorders.

Association between Core Beliefs and Specific Eating Disorder Subgroups

In the previous section we have seen that negative beliefs are characteristic of women with eating disorders. In order to build on these findings, six studies have investigated whether specific core beliefs are characteristic of the different eating disorder subgroups. However, in comparison to the previous section, there is a less consistent pattern of findings.

In accordance with the proposal that the eating disorder subgroups have similar core beliefs (Waller, Kennerley, et al., 2007), Cooper, Todd and Wells (1998) found that individuals with AN and BN both reported self-beliefs characterised by themes of worthlessness, uselessness, inferiority, failure, abandonment and loneliness, during a semi-structured interview. However, the results of two studies (Waller, 2003; Waller, Ohanian, Meyer, & Osman, 2000) using the YSQ contradict the findings of Cooper et al. (1998). Waller et al. (2000) reported that differing levels of three core beliefs (defectiveness/shame, failure to achieve and insufficient self-control) could effectively differentiate three subgroups of BN (anorexia of the binge/purge subtype [BPAN], BN and BED)[5]. In a separate study by Waller (2003), individuals with BED scored higher on failure to achieve, dependence/incompetence and entitlement core beliefs in comparison to those with BN. Collectively, these findings led them to conclude that particular cognitive profiles might be characteristic of different bulimic disorders. However, this conclusion is limited because there is no consistency between the studies in the core beliefs identified as being important. This lack of consensus could be due to the fact that

[5] Normal weight BN patients saw themselves as flawed and lacking in control, but as relatively successful. In contrast, the BPAN group saw themselves as even more flawed and lacking in control, but relatively unsuccessful. BED patients did not view themselves as strongly flawed or lacking in control, but saw themselves as relatively unsuccessful.

the YSQ requires multiple analyses which increase the likelihood of type one error and chance findings.

To overcome this difficulty and to increase statistical robustness, three studies (Dingemans et al., 2006; Unoka, Tolgyes, & Czobor, 2007; Unoka, Tolgyes, Czobor, & Simon, 2010) using the YSQ have grouped core beliefs together into four higher order factors. Interestingly, conflicting findings have still been found despite this alternative approach being employed. In support of the SBCB model, Dingemans et al. (2006) found that individuals with AN and BN did not differ on their scores on either of the four domains.

In contrast, the remaining two studies employing the use of schema domains found a pattern of results which suggests that there are differences in the levels and content of core beliefs between diagnostic subgroups. Unoka et al. (2007) found that patterns of core beliefs differed between women with AN (both restrictive AN [RAN] and BPAN) and BN. Individuals with AN scored significantly higher on self-sacrifice, unrelenting standards and punitiveness beliefs (Unoka et al., 2007). Individuals with BPAN also scored significantly higher on all schema domains compared to individuals with RAN and BN, which was proposed to reflect the comorbidity of bulimic and anorexic symptomology in the BPAN client group (Unoka et al., 2010).

The discrepancies reported in this area of research could be due to differences in the samples and methodologies employed. It could be argued that some of the studies that found differences between subgroups (Unoka et al., 2007; Waller et al., 2000) recruited a population likely to have more severe symptoms (out-patients receiving individual therapy and in-patients) than studies that did not find significant differences (e.g., patients with either AN, BN or EDNOS; Dingemans et al., 2006). It is possible that severe symptoms are more likely to co-occur with higher levels of negative core beliefs and thus

help explain the difference in results (Unoka et al., 2007). However, even the studies that report differences between the subgroups have not yielded consistent results. One reason for this could be that the subgroups compared differed between the studies and the sample sizes varied, which reduces the comparisons that can be made and the sensitivity of the design (Jones, Leung, & Harris, 2007).

In sum, research in this area is still in its infancy and the inconsistent results prevent conclusions being made regarding whether specific patterns of core beliefs characterise different eating disorder subgroups. Although more research is needed to clarify this area, using self-report measures, that are not specific to eating disorders, to investigate this relatively unknown area is likely to result in further inconsistent findings (Cooper, 2005). Instead, research that employs experimental or semi-structured interview designs may help to shed light on these inconsistencies and help determine whether the prediction made by the SBCB model (Waller, Kennerley, et al., 2007) is supported. Additionally, many of the eating disorder subgroups share common symptoms and therefore from a clinical perspective it may be more meaningful to concentrate on investigating the relationship between core beliefs and specific symptomology in this population. If specific patterns are identified, this would help inform which core beliefs to target in clinical interventions. Research exploring this relationship will now be reviewed.

Association between Core Beliefs and Specific Eating Disorder Symptomology

Similar to the research in the previous section, research investigating whether specific core beliefs are linked to particular eating disorder behaviours has yielded inconclusive results. Although neither model makes specific predictions about these relationships, they have been investigated in an attempt to further understand the role of these deep-set beliefs.

Research investigating the pattern of core beliefs associated with bulimic symptomology is the first area that has yielded disparate results. Two studies (Jones et al., 2005; Waller, Dickson, & Ohanian, 2002) using the bulimic scale of the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983) and the YSQ have found different patterns of results, thus suggesting that bulimic attitudes and behaviours may not be linked to specific core beliefs. In a correlational study with seventy-five women with either BPAN, BN or BED, high bulimic attitudes and behaviour scores were associated with emotional deprivation, social isolation and insufficient self-control beliefs (Waller et al., 2002). In contrast, Jones et al. (2005) found that women who reported more bulimic attitudes and behaviour scored highly on abandonment and vulnerability to harm beliefs. One reason for these different findings could be due to the measure employed. The EDI captures attitudes and behaviour linked to both bingeing and purging. Given that these two behaviours may be associated with different beliefs, employing measures that enable the exploration of the two behaviours separately may yield clearer results.

In order to achieve this, three studies (Leung et al., 1999; Waller, Meyer, Ohanian, et al., 2001; Waller et al., 2000) asked participants to keep a diary of their bingeing and vomiting behaviours. Correlation and regression analyses were then conducted to determine whether specific core beliefs were linked to the frequency of these behaviours. Unfortunately, these studies have not succeeded in adding much clarity to this area. Waller et al. (2000) found that the frequency of bingeing was positively associated with core beliefs related to emotional inhibition and the frequency of purging was predicted by defectiveness/shame beliefs. These results were replicated by Waller, Meyer, Ohanian, et al. (2001), however, they also found other core beliefs to be significant predictors of bingeing and vomiting behaviour (insufficient self-control, social isolation; abandonment, dependence/incompetence and emotional inhibition respectively), thus demonstrating

little consistency between the studies. Interestingly, the third study using this design found that binge-eating was negatively associated with social undesirability beliefs in women with BN but this pattern of results was not true for those with BPAN. Similarly, the same study also found that failure to achieve beliefs predicted vomiting behaviour in individuals with BPAN but not individuals with BN (Leung et al., 1999). This difference in association suggests that, although diagnostic sub-categories share similar symptomology, different patterns of beliefs may be linked to behaviours in different disorders. This is further supported by the finding that there are differences in the core beliefs associated with bingeing between BN and BED patients (Waller, 2003). Given this finding, it is possible that the combining of subgroups when investigating the links between core beliefs and specific symptomology (e.g., Waller, Meyer, Ohanian, et al., 2001; Waller et al., 2000) may explain the inconsistent findings in this area. Relying on self-reporting of bingeing and purging behaviour may have also affected the reliability of the results because what constitutes a binge is highly subjective.

Overall, the results reviewed above do not allow for conclusions to be made about the relationship between core beliefs and bulimic symptomology. The majority of the core beliefs measured by the YSQ have been associated with bulimic attitudes and behaviours throughout these studies and thus collectively the results add little more to the conclusion that core beliefs are present in individuals with eating disorders.

An alternative way to determine whether core beliefs influence eating disorder behaviour is to investigate whether they affect treatment outcomes. Only one study to date has adopted this design (Leung, Waller, & Thomas, 2000). Even after the impact of pre-treatment symptoms were taken into account, pre-treatment core beliefs were associated with the degree of change in bulimic symptomology. High scores on dependence/incompetence beliefs were associated with the failure to demonstrate an

improvement in bulimic attitudes. Interestingly this relationship has not been reported in any of the studies reviewed above. In contrast, high scores on pre-treatment defectiveness/shame beliefs predicted failure to reduce the frequency of vomiting. This latter result adds support to the finding that defectiveness/shame beliefs play a role in purging behaviour (Waller et al. 2000; 2001). Further support for this link comes from the discovery that individuals with BN report the activation of defectiveness/shame beliefs prior to vomiting (Hinrichsen, Morrison, Waller, & Schmidt, 2007). Four separate studies have now highlighted the association between defectiveness/shame core beliefs and purging behaviour, which is the most consistent result in this area. Waller et al. (2000) hypothesise that this finding is in accordance with the proposal that vomiting results from a need to reduce the awareness of aversive cognitions about oneself (Pitts & Waller, 1993). This idea is also consistent with the SBCB model, which suggests that individuals with BN engage in behaviours to reduce negative affect associated with the activation of core beliefs (Waller, Kennerley, et al., 2007). The finding that this core belief may have a role in BN symptomology therefore makes theoretical sense.

In comparison to bingeing and compensatory behaviours, less research has been conducted into the relationship between core beliefs and restrictive symptoms. Preliminary findings have come from one study in this area. In a sample of individuals with BN, Waller et al. (2002) found restrictive behaviour was higher amongst those who had higher scores on dependence/incompetence and emotional inhibition beliefs. However, further research which recruits individuals with AN is needed to develop our understanding of the role of core beliefs in restrictive pathology.

In addition to the core symptoms associated with diagnostic categories, three studies have investigated links between core beliefs and other symptomology. Given that these studies have not been replicated, meaningful conclusions cannot be made and

therefore the main findings will only be briefly outlined. Results from two studies by Unoka et al. (2007; 2010) suggest that the core beliefs associated with two compensatory behaviours (laxative and diet pill usage) are distinct (Unoka et al., 2010) and that Body Mass Index (BMI) is negatively associated with a group of maladaptive core beliefs (Unoka et al., 2007). Lawson, Emanuelli, Sines and Waller (2008) investigated alexithymia[6] in eating disorders and found that core beliefs were related to difficulties in externalising emotions. Similar to the other results in this area, all three studies found that several core beliefs were correlated with these behaviours and thus no clear predictive pattern has emerged.

In sum, the literature in this area suffers from a lack of consensus as to whether specific core beliefs are related to particular eating disorder symptoms (Jones et al., 2007). Such inconsistency precludes the identification of important beliefs, which consequently hampers the direction of effective therapies and treatment (Jones et al., 2007). The only pattern that has emerged is the potential link between defectiveness/shame core beliefs and vomiting behaviour. However, given the methodological limitations that exist more research is needed before this finding can be used to inform clinical practice.

Overall Limitations

A limitation true of all the research on core beliefs in eating disorders is that it relies heavily on cross-sectional and correlational designs. Although Cooper et al. (2004) propose that core beliefs are developed in response to early experiences and therefore contribute to the development of the disorder, cross-sectional designs prevent this prediction being tested. However, there is a small body of research which supports this prediction. Self-reported early negative experiences, such as perceived low maternal care,

[6] Defined as the inability to identify and express emotional states (Lawson et al., 2008).

are associated with the development of dysfunctional core beliefs in individuals with AN (Leung, Thomas, & Waller, 2000). One study using an experimental design has also found that core beliefs characteristic of disordered eating are significant predictors of eating disorder symptoms in a group of individuals at risk of developing this disorder (Pringle, Harmer, & Cooper, 2010). Although these results are promising, longitudinal designs are needed before firm conclusions can be made about the direction of causality and the operational role of these beliefs in this clinical population (Jones et al., 2007).

As mentioned before, the high reliance on self-report measures is another weakness of this area. In addition to the likelihood of respondent bias, core beliefs are considered to operate outside of conscious awareness (Young & Gluhoski, 1996) and therefore whether these constructs can be accurately assessed using these measures is questionable. Although research utilising experimental paradigms has replicated self-report findings (e.g., Meyer & Waller, 2000), which suggests the latter is assessing relevant constructs, future research which uses a mixture of methodologies may help ensure that the relevant beliefs are being measured. A further difficulty with measuring core beliefs is that questionnaire designs may activate core beliefs and the accompanying schema processes (Jones et al., 2007). Consequently, it is difficult to know what exactly is being measured by these questionnaires.

Summary

Several studies have demonstrated that higher levels of negative core beliefs are characteristic of individuals with eating disorders. These findings support the two models outlined earlier, which propose that cognitions other than those related to eating, shape and weight are important in the development and maintenance of eating disorders (Dingemans et al., 2006). Waller, Kennerley, et al. (2007) also propose that there is no difference between the content of schema-level beliefs between AN and BN. However, it

is difficult to draw conclusions regarding this prediction because research investigating whether certain core beliefs are characteristic of specific eating disorder subgroups and symptomology has yielded inconsistent findings and has been hampered by methodological weaknesses. Although the lack of consistency is disappointing, it should also be considered that there may not be an association between certain core beliefs and symptomology. Clinical experience informs us that core beliefs are often idiosyncratic and therefore, although core beliefs have a role, the content of these vary between individuals. It is therefore possible that even apparently similar behaviour may be maintained by very different cognitions. In accordance with the SBCB model, it may therefore be that differences in schema processes better distinguish the two disorders. Empirical evidence specifically investigating schema processes will now be reviewed.

Role of Schema Processes in Eating Disorders

In addition to the importance of core beliefs, the models propose that underlying assumptions and associated behaviours develop as schema compensation mechanisms (Cooper et al., 2004) and that AN and BN are characterised by different schema processes (Waller, Kennerley, et al., 2007). In comparison to research on core beliefs, only seven studies have investigated these proposals. Although inconsistencies exist, there is evidence to support the predictions of both models.

Schema Compensation in Eating Disorders[7]

Before reviewing studies in this area, as mentioned before, preliminary support for schema processes having a role in eating disorders is provided by some of the studies outlined above. Of note, three YSQ compensatory core beliefs (subjugation, emotional inhibition and unrelenting standards) were found to be more characteristic of individuals with an eating disorder compared to 'recovered individuals' (Jones et al., 2005). During a semi-structured interview individuals with AN also reported that they employed specific behaviours such as 'not eating enough' and 'placating others' to try to reduce the cognitive and emotional impact of negative self-beliefs (Woolrich et al., 2006). Collectively these results suggest that individuals with eating disorders employ compensatory processes and behaviours to avoid the activation of schemas (Waller, Cordery, et al., 2007).

[7] As stated in the introduction, schema compensation occurs when individuals employ behaviours to avoid the activation of negative schemas. An example of this is the compensatory schema of 'unrelenting standards' (perfectionism) being activated to reduce the risk of triggering the 'failure to achieve' schema. The resulting perfectionist behaviour can manifest in a number of ways, including restrictive eating, compulsive exercise or obsessive-compulsive behaviours (Waller, Cordery, et al., 2007).

Three studies (Boone, Braet, Vandereycken, & Claes, 2013; Gongora, Derksen, & van Der Staak, 2004; Hughes, Hamill, van Gerko, Lockwood, & Waller, 2006) investigating the links between core beliefs, eating-related cognitions and behaviour provide support for the links between the different levels of cognition proposed by Cooper et al. (2004) and the assertion that assumptions act as schema compensation strategies (Cooper et al., 2004). In a study of seventy-five outpatients with BN, Gongora et al. (2004) reported a distinctive pattern of associations between certain core beliefs and eating-related cognitions. The 'defectiveness' core belief was related to cognitions of rigid weight regulation[8], and 'failure to achieve' was related to a perception of weight and eating as the basis for approval from others. Importantly, these associations were still evident after controlling for depression (Gongora et al., 2004). A study by Hughes et al. (2006) also found that disorder-specific cognitions only predicted BMI and vomiting in the presence of unhealthy core beliefs. Collectively, these results suggest that disorder-specific cognitions are associated with core beliefs and may function as schema compensation strategies which motivate compensatory behaviours. Although in need of replication, the study by Gongora et al. (2004) provides important insight into which core beliefs may be driving specific eating-related cognitions and adds further support to the potential importance of defectiveness core beliefs in this clinical population. Future research which further explores these links would usefully inform clinical practice.

Boone et al. (2013) provide support for the idea that assumptions act as schema processes. A mediation analysis found that perfectionism mediated the relationship

[8] These disorder specific cognitions were measured by The Mizes Anorectic Cognitions Scale (Mizes & Klesges, 1989) which measures three domains of cognition in eating disorders: the perception of weight and eating as the basis for approval from others, the belief that rigid self-control is fundamental to self-worth, and rigidity of weight and eating regulation efforts.

between two schema domains (impaired autonomy and over-vigilance[9]) and body image concerns in eighty-eight in-patients with AN,BN or EDNOS. In accordance with both theoretical models, this suggests that perfectionist cognitions may act as a coping strategy to avoid or deal with distressing feelings associated with core beliefs belonging to these schema domains (Cooper et al., 2004; Waller, Kennerley, et al., 2007). These results also support the prediction of the transdiagnostic model regarding perfectionism being a key maintenance factor in eating disorders (Fairburn et al., 2003). These findings suggest that a reduction in symptomology is likely to require interventions which target both levels of cognition. Future research evaluating changes in the association between core beliefs and assumptions after cognitive therapy would provide further insight into this link and also help investigate whether therapeutic techniques are accessing the right levels of cognition (Gongora et al., 2004).

A shortcoming of the research outlined above is the use of cross-sectional designs. Cooper et al. (2004) predict that core beliefs influence the development of eating-related assumptions; however, longitudinal studies are needed to test this. Support for the idea that assumptions act as compensatory strategies is also only implied in the studies above and therefore research which employs a specific measure of these processes is needed. Additionally, the high reliance on BN samples means that conclusions regarding the importance of schema compensation in AN (Waller, Kennerley, et al., 2007) cannot be made.

In order to address this gap, two studies (Luck, Waller, Meyer, Ussher, & Lacey, 2005; Mountford, Waller, Watson, & Scragg, 2004) have specifically tested the

[9] Core beliefs incorporated in each domain are as follows. Impaired Autonomy: Dependence/Incompetence, Vulnerability to Harm, Enmeshment and Failure to Achieve. Over-vigilance: Negativity/Pessimism, Emotional Inhibition, Unrelenting Standards and punitiveness.

prediction that compensatory processes are characteristic of individuals with AN (Waller, Kennerley, et al., 2007). Improving on the weakness mentioned above, two of the studies (Luck et al., 2005; Spranger, Waller, & Bryant-Waugh, 2001) investigating the predictions of the SBCB model have also employed two self-report questionnaires to measure schema avoidance and compensation. The Young Compensatory Inventory (YCI; Young, 1995) is a 48-item questionnaire which measures methods of schema compensation and the Young-Rygh Avoidance Inventory (YRAI; Young & Rygh, 1994) assesses the presence of behavioural/somatic and cognitive/emotional avoidance[10].

Consistent with the SBCB model, Luck et al. (2005) used these two measures and found that primary and secondary avoidance of affect was evident in individuals with AN and secondary avoidance was characteristic of BN. Primary and secondary avoidance was also highest in BPAN, which, although is not predicted by the model, may reflect the two conflicting eating disordered behaviours present in this clinical group (Luck et al., 2005). Further support for the idea that individuals with AN employ compensatory processes comes from the finding that individuals with AN scored higher than those with BN on two YSQ compensatory core beliefs (Unoka et al., 2007). A limitation of the study by Luck et al. (2005) is that the YCI and YRAI have only been subjected to preliminary validation, and as with the YSQ, rely on self-report. Alternative designs are therefore needed to corroborate these findings.

In contrast to Luck et al's. (2005) results, a study employing an experimental paradigm did not find evidence of schema compensation processes in individuals with AN (Mountford et al., 2004). It was hypothesised that subliminal triggering of negative

[10] Cognitive/emotional avoidance is the blocking of thoughts or emotions to reduce the experience of affect and behavioural/somatic avoidance is avoiding physical sensations associated with affect and engaging in escape behaviours to avoid experiencing affect.

affect (via abandonment-related cognitions) would lead to the activation of a schema compensation process, which would be demonstrated behaviourally by increased levels of perfectionist over-searching for an absent target. Contrary to this hypothesis, women with AN made more errors in searching for the absent target following abandonment cues (Mountford et al., 2004). The authors suggested that the decreased accuracy in women with AN may reflect the back-up mechanism of secondary avoidance of affect proposed by the SBCB model (Waller, Kennerley, et al., 2007). However, given that this pattern of results was not demonstrated in the BN group, further research is needed to clarify and replicate these findings. A relative weakness of this study is that it only measured perfectionism. Other compensatory schemas may have been activated during the task and therefore more research is needed to assess whether there is an increase in other behaviours related to compensatory processes (e.g., emotional inhibition, subjugation) before drawing firm conclusions (Mountford et al., 2004).

Schema Avoidance in Eating Disorders

The SBCB model suggests that secondary avoidance of affect (schema avoidance) is characteristic of individuals with BN and is also employed by individuals with AN when schema compensation fails (Waller, Kennerley, et al., 2007). As mentioned above, the link between defectiveness/shame core beliefs and vomiting behaviour provides preliminary support for this prediction. Additionally, two studies using the YRAI reported that secondary avoidance of affect is characteristic of individuals with BN (Luck et al., 2005) and that individuals with BN report a substantially higher level of both behavioural/somatic and cognitive/emotional avoidance than non-clinical women (Spranger et al., 2001). Interestingly, Spranger et al. (2001) also found that women with BN who had higher levels of eating pathology were less likely to report using schema avoidance methods than women with less severe symptoms. These findings indicate that

in more extreme cases of eating pathology, avoidance of negative emotion may not be the primary function of bulimic behaviour. In these more severe cases, bingeing and vomiting may serve a range of additional functions, such as self-punishment (Spranger et al., 2001). Although collectively these results support the model, and suggest schema processes are associated with eating pathology, they also highlight the importance of assessing the function of eating disorder behaviours to ensure the development of a comprehensive formulation (Spranger et al., 2001).

The two models (Cooper et al., 2004; Waller, Kennerley, et al., 2007) also hypothesise a link between early experiences and the development of schema processes and eating pathology. Only one study to date has investigated this link. Sheffield et al. (2009) found that behavioural/somatic avoidance (measured by the YRAI) was a partial mediator of the relationship between emotionally inhibited mothers and body dissatisfaction in individuals with eating disorders. Behavioural/somatic avoidance is thought to be used more than cognitive/emotional avoidance because emotionally inhibited mothers are unlikely to model effective ways of dealing with emotions and therefore the child is likely to rely on using the more basic process of behavioural/somatic avoidance later in life (Sheffield et al., 2009). The idea that cognitive/emotional avoidance does not play a key role in eating disorder psychopathology is also supported by studies that have not found a difference in the use of this avoidance strategy between eating disorder subgroups (Luck et al., 2005) or clinical patients and controls (Sheffield et al., 2009). Although this study provides support for the idea that schema processes develop to help manage intolerable cognitions/emotions arising from adverse early experiences, definite conclusions regarding causality cannot be made. The use of self-report measures to assess parenting behaviour further weakens these results. Responses are likely to be influenced by recall bias and other factors such as the individual's more

recent experiences of their parents and cognitive filters like core beliefs (Sheffield et al., 2009). Future research which employs longitudinal designs and assesses possible mediator and moderator variables, in addition to employing more objective measures, would provide more reliable causal information (Sheffield et al., 2009).

Summary

Although research into schema processes is in its infancy and there are some inconsistencies in the findings, there is preliminary support for the predictions made by the models. There is evidence to support the links between different levels of cognitions predicted by Cooper et al. (2004). Collectively, there is also evidence to suggest that individuals with eating disorders employ schema compensation and schema avoidance strategies and preliminary research indicates that these strategies are likely to play a role in the development as well as the maintenance of this disorder (e.g., Sheffield et al., 2009). The discrepancies between studies investigating the predictions of the SBCB model may reflect the complexity of this clinical population. More specifically, individuals with eating disorders often experience both restrictive and bulimic symptoms regardless of their diagnosis and therefore are likely to use both schema processes to allow for the maximum avoidance of negative affect (Waller, Cordery, et al., 2007). A future development of the model may therefore be to move away from diagnostic categories and focus more on the specific schema processes behind restrictive and bulimic behaviours (Mountford et al., 2004). Certain behaviours may also be acting as primary and secondary avoidance of affect in different situations and therefore the function of the behaviour needs to be assessed when exploring the schema processes being employed in a clinical setting (Waller, Kennerley, et al., 2007).

Clinical Implications and Avenues for Future Research

In sum, although inconsistencies exist and it is unclear whether specific beliefs are central to the disorder, there is at least some evidence to suggest that core beliefs and schemas processes play a role in the development and maintenance of eating disorder psychopathology. These findings may help to explain why conventional Cognitive Behavioural Therapy (CBT) protocols, which primarily focus on disorder-specific cognitions (e.g., over evaluation of eating, shape and weight), may not be an effective treatment approach for all individuals with eating disorders. Given that there is some empirical support for the role of schema-level cognitions, it is important to consider how treatment protocols can be enhanced to help modify these beliefs when traditional approaches are not effective. Waller, Kennerley, et al. (2007) have suggested that schema-focused CBT interventions can be used to augment treatment protocols. In accordance with the purpose of their model, Waller, Kennerley, et al. (2007) highlight the importance of using these techniques in conjunction with approaches that target disorder-specific cognitions. They acknowledge that although rendering core beliefs less powerful will mean they have less impact on the emotion-driven behaviours; this will not reduce the role of disorder-specific beliefs, which, as demonstrated in the model by Cooper et al. (2004), have a role in the maintenance of the disorder.

The main aim of schema-focused interventions is to achieve an attributional shift, so that individuals do not blame themselves for the experiences that determined their core beliefs (Waller, Cordery, et al., 2007). The majority of the interventions proposed by Waller, Cordery, et al. (2007) involve helping clients to examine, test and change their cognitions through verbal techniques. However, imagery can also provide a powerful way to achieve these attributional shifts. Core beliefs are often developed at a time when cognitive material is more likely to be encoded in affective, visual, or kinaesthetic forms

(Ohanian, 2002) and therefore imagery can gain direct access to schemas in a way that verbal approaches cannot (Layden, Newman, Freeman, & Morse, 1993). Stopa (2009) also proposes that there is a triadic relationship between images, autobiographical memories and core beliefs. Given this relationship and the proposal that images may provide cues for reactivating memories and their associated emotion and meaning (Holmes, Mathews, Mackintosh, & Dalgleish, 2008), imagery rescripting has been developed to modify negative meanings linked to autobiographical memories of traumatic/distressing experiences (Stopa, 2011). The approach involves a combination of verbal restructuring (exploring alternative meanings), imaginal exposure (deliberately evoking the intrusive memory) and imagery rescripting (using imagery to challenge or modify the meaning of the memory).

Recently, imagery rescripting has been used with the eating disorder population to modify core beliefs and although preliminary, the results are promising (e.g., Cooper, Todd, & Turner, 2007; Ohanian, 2002). Specifically, in a case study, Ohanian (2002) used imagery rescripting to address an early memory and modify a core belief of defectiveness/incompetence that had remained unchanged after using standard CBT techniques. Whilst eight sessions of CBT had resulted in a 50% reduction in binge-vomit frequency, a further 75% reduction in the remainder of this behaviour was reported after one session of imagery rescripting. In a more comprehensive investigation of this intervention, Cooper et al. (2007) found that one session of imagery rescripting resulted in significantly greater reductions in emotionally held belief ratings[11] than a control

[11] It is proposed that emotional core beliefs (distinguished from rational core beliefs) have no specific truth value and reflect input from many sources, including sensory inputs. E.g., 'I know rationally that I am not stupid, but I don't believe it emotionally or deep inside' (Teasdale, 1997, as cited in Cooper et al., 2007).

condition. These belief changes were also associated with reductions in negative mood and urges to binge-eat. Given that emotional beliefs are often difficult to alter in cognitive therapy, these results further suggest that imagery may confer certain advantages over traditional verbal strategies (Somerville & Cooper, 2007). Although these findings are promising, both studies used small samples. Additionally, Cooper et al. (2007) did not schedule a follow-up to investigate whether the gains were maintained, nor did they use any manipulation checks or objective measures of eating behaviour (Cooper et al., 2007). Further research is therefore needed to replicate these findings.

Despite these limitations, collectively these preliminary findings indicate that imagery rescripting is applicable and effective at modifying core beliefs that are often resistant to change (Leung, Waller, et al., 2000). This approach may therefore be a useful addition to CBT for eating disorder protocols, especially in cases where emotional core beliefs are resistant to verbal challenging.

Directions for Future Research

As well as replicating previous findings regarding imagery rescripting, there are other avenues for future research in this area. Firstly, the use of imagery rescripting with individuals with AN needs to be explored before firm conclusions regarding its applicability to eating disorder populations as a whole can be made. Secondly, we need to know more about patients' experience of imagery work and also for whom and when imagery is most effective (Stopa, 2011). Thirdly, given the high levels of core beliefs in this population, research investigating the applicability and effectiveness of compassion focused imagery in this population would also further increase potential clinical protocols that can be utilised with this population (Tatham, 2011). Finally, the mechanism underlying imagery rescripting is unknown. Although it has been suggested that exposure and habituation to the memory may explain the observed change, Cooper et al. (2007)

suggest that a metacognitive framework (Wells, 2000) may explain the effects of imagery rescripting. This framework proposes that emotional beliefs are based on internal information such as feeling states and memories. Therefore bringing a trusted figure into the image enables the individual to retrieve positive information, antagonistic to the negative information in the memory, thus changing the emotional belief and the relationship to that belief (Cooper et al., 2007). Future research which employs a broader range of measures of psychological function to investigate the active component in imagery rescripting would provide insight into how it works which in turn will help increase its effectiveness (Tatham, 2011).

So far, research regarding the use of imagery techniques in eating disorder populations has been largely confined to targeting schema-level beliefs using rescripting techniques. Recently, research has also explored the presence and role of self-imagery in eating disorders. This has shown that individuals with BN experience negative self-imagery before vomiting and when thinking about their weight and shape (Hinrichsen et al., 2007; Somerville, Cooper, & Hackmann, 2007 respectively). In accordance with the role of spontaneous imagery in other disorders (e.g., social anxiety; Hirsch, Clark, Mathews, & Williams, 2003), these preliminary findings suggests that negative images of the self may play a role in the maintenance of eating disorder symptomology. Research in the social anxiety field has demonstrated that retrieving a positive self-image resulted in a more positive and functional working self (measured by levels of self-esteem and self-concept clarity) compared to the retrieval of a negative self-image in this population (Hulme, Hirsch, & Stopa, 2012; Stopa, Brown, & Hirsch, 2011). Exploring how the retrieval of differently valenced self-images effects the self-concept in individuals with eating disorders could therefore be an interesting avenue for future research. If the same effects are found as those reported by Hulme et al. (2012), incorporating such

interventions into treatment protocols may help increase positive representations of the self and improve key maintenance factors such as low self-esteem. Additionally, a role for self-imagery is currently not recognised in the cognitive models of eating disorders. Further exploration of the content and meaning of self-imagery in this population would therefore also help to advance theoretical understanding.

Conclusion

The importance of the self-concept in eating disorders has become increasingly more recognised and cognitive models have been updated to incorporate the role of self-schemas in the development and maintenance of this disorder (Cooper et al., 2004; Waller, Kennerley, et al., 2007). Consequently research regarding the cognitive components of eating disorders has evolved from examining beliefs about weight and shape, to exploring the role of schema content and processes. Empirical research has demonstrated that women with eating disorders have significantly higher levels of maladaptive beliefs about themselves, others and the world than do non-eating disordered women (e.g., Dingemans et al., 2006), and there is preliminary evidence to suggest that core beliefs relating to defectiveness/shame may play a specific role in the presentation of symptoms (e.g., Waller et al., 2000). Research has also demonstrated that individuals with AN and BN employ schema compensation and avoidance strategies (e.g., Luck et al., 2005) and collectively evidence suggests that self-schemas may influence the development and maintenance of eating disorder symptomology. Clinically, this research has highlighted the importance of developing techniques to access and modify these self-schemas. Imagery provides a powerful alternative to verbal techniques and preliminary research suggests imagery rescripting effectively reduces maladaptive core beliefs in this population (e.g., Cooper et al., 2007). Given recent advances in our understanding of this clinical disorder, exploring other ways imagery can be used to access and modify ones sense of self in this population is an area worthy of future attention.

Empirical Paper

Self-Imagery in Eating Disorders: The Effect of Positive and Negative Self-Imagery on Aspects of the Self-Concept

Word Count: 9,703

Self-Imagery in Eating Disorders: The Effect of Positive and Negative Self-Imagery on Aspects of the Self-Concept

Eating disorders are characterised by a negative sense of self which is reflected in the low levels of self-esteem (Fairburn et al., 2003), and high number of negative self-beliefs (e.g., Cooper & Turner, 2000) found in this population. Although cognitive models of eating disorders acknowledge a central role for the self in the development and maintenance of this disorder (Cooper et al., 2004; Waller, Kennerley, et al., 2007), one area not considered by these models is the role of self-imagery. Self-images are mental representations of the self that occur without the need for external sensory input and can be either deliberately self-generated or involuntary. Self-imagery is therefore considered a window to the self and can provide a potent form of self-representation (Stopa, 2009).

Although historically a relatively neglected area in the eating disorder literature, the proposed importance of imagery in other Axis I disorders (e.g., social anxiety), has recently resulted in an increased interest in the role of self-imagery in individuals with Bulimia Nervosa (BN). In accordance with other psychological disorders, preliminary research (Hinrichsen et al., 2007; Somerville et al., 2007) suggests that individuals with BN experience self-imagery, and that the content of these images encapsulates the negative self-view characteristic of the disorder. Specifically, individuals with BN reported experiencing spontaneous negative images of the self when worrying about their eating, weight and shape (Somerville et al., 2007) and before vomiting (Hinrichsen et al., 2007). These images reflected a negative perception of their body shape and size and were reported to be recurrent, vivid and associated with significant feelings of shame and anxiety (Hinrichsen et al., 2007; Somerville et al., 2007). For example, when asked to describe the image she experienced the last time she worried about her eating, shape or weight, one participant reported: ‘‘I see myself standing there naked except for my

underwear. I can see rolls of fat around the back. Flesh spilling out over my underwear. I hear myself saying ‘you are so disgusting.’’ (Somerville et al., 2007, p.440).

These negative self-images were also linked to autobiographical memories of adverse early experiences. In particular, they were linked to early memories of negative comments about weight and shape (Somerville et al., 2007) and childhood memories related to humiliation, abuse and abandonment (Hinrichsen et al., 2007). Collectively, these preliminary findings suggest that negative self-imagery might be an important feature in the maintenance of BN and may be linked to the triggering of behavioural symptomology (Hinrichsen et al., 2007).

Similar results regarding the nature and importance of self-imagery have been found in the social anxiety literature (e.g., Hackmann, Surawy, & Clark, 1998). Researchers (e.g., Hulme et al., 2012) in this field have proposed that negative self-images and their associated memories reflect the ‘working self’ in Conway and Pleydell-Pearce’s (2000) Self Memory System (SMS) model. This model helps to explain the complex and dynamic nature of the self and can be usefully applied to help understand the role of self-images in BN. The SMS stores conceptual knowledge, beliefs (e.g., I am kind) and autobiographical information (e.g., memories of specific events) about the self and provides a knowledge base from which self-representations are constructed (Conway & Pleydell-Pearce, 2000). According to the model, individuals have a stable long-term self that is the result of an interaction between conceptual and autobiographical knowledge about the self, and a working self that is constructed in response to situational demands. An individual’s current working self is similar to working memory (Baddeley & Hitch, 1974) in that it provides us with access to self-knowledge that is needed in a given situation (Conway & Pleydell-Pearce, 2000). It incorporates attitudes towards the self, beliefs about the self, memories of past events, and associated feelings, somatic

sensations, and behaviours (Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004).

Brewin's (2006) retrieval competition hypothesis helps us to understand how the retrieval of a negative working self contributes to the negative self-view inherent in clinical disorders such as BN. He proposes that there are multiple self-representations that all compete for retrieval. The repeated activation of a negative working self (characterised by negative beliefs and attitudes towards the self) increases the accessibility of this negative self-representation, making it more likely to win the retrieval competition. The repeated activation of such negative self-representations is also proposed to inhibit the availability of positive representations and thus maintains the negative self-view characteristic of disorders such as BN (Brewin, 2006). If images of the self do reflect an individual's current working self (as proposed by Hulme et al., 2012), then this hypothesis suggests that one way to improve one's working self-concept (attitudes and feelings towards the self) is to recall images of the self associated with positive autobiographical memories.

This idea has been tested in the social anxiety literature. Manipulating the retrieval of self-images was found to impact on an individual's self-representation and sense of self. Specifically, retrieving a positive self-image resulted in a more functional working self (measured by levels of self-esteem and self-concept clarity) compared to when a negative self-image was retrieved (Hulme et al., 2012; Stopa et al., 2011).

To date, no research has investigated the impact of self-imagery on the self-concept in individuals with eating disorders. Given the hypothesised links between imagery and the working self, it is possible that the negative self-images reported by individuals with BN represent the current working self that is retrieved when thinking about their eating, weight or shape. The negative content and negative affect associated

with these images (Hinrichsen et al., 2007; Somerville 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. These negative self-images may therefore contribute to the negative self-view inherent in this disorder and could be an important target for treatment.

This study aimed to extend the current eating disorders literature by examining how the valence of self-imagery affects different aspects of the self. In order to achieve this, the experimental paradigm used by Hulme et al. (2012) was applied to a group of individuals with high body dissatisfaction. Body dissatisfaction is a central feature of eating disorders (Johnson & Wardle, 2005), and therefore individuals who score highly on this construct were considered a suitable non-clinical sample on which to test this paradigm. In order to examine the effect of manipulating positive and negative self-imagery on aspects of the self-concept, self-esteem (implicit and explicit) and self-concept clarity were used as a proxy for the working self-concept in this study. These two aspects of the self will now be discussed.

In order to investigate the effects of self-imagery, it is important to operationalise the working self-concept and define measureable components of this construct. Self-esteem provides one way of measuring the content of the working self-concept. It represents an active evaluative attitude towards the self (Demo & Savin-Williams, 1992; Rosenberg, 1989) and consists of both implicit (automatic, non-conscious self-evaluations) and explicit (conscious and deliberate self-evaluations) components (Stopa, Brown, & Hirsch, 2012). As mentioned before, low explicit self-esteem is characteristic of the self-concept of individuals with eating disorders and is predicted to have an important role in the disorder (Fairburn et al., 2003). Specifically, low self-esteem is proposed to be a risk factor for developing overvalued ideas about body, weight and

appearance (Meijboom, Jansen, Kampman, & Schouten, 1999) and is predicted to be a causal and maintenance factor in eating disorder pathology (Fairburn et al., 2003). If, as found by Hulme et al. (2012), differently valenced self-images are able to affect levels of self-esteem in this population, then imagery techniques could be an effective way to improve this aspect of the self.

In terms of implicit self-esteem, only one study to date (Cockerham, Stopa, Bell, & Gregg, 2009) has investigated this construct in an eating disorders population, and discrepancies between implicit and explicit self-esteem were reported. As expected, individuals with BN had lower levels of global and specific (weight and shape based self-esteem) explicit self-esteem than controls. However, in contrast, individuals with BN had a more positive implicit self-esteem bias than controls (Cockerham et al., 2009). This implicit positive self-esteem bias is common in healthy individuals and has also been demonstrated in other clinical disorders (e.g., depressed individuals; De Raedt, Schacht, Franck, & De Houwer, 2006).

The discrepancy between the two self-esteem systems is in accordance 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, contrary to this idea, Hulme et al. (2012) found that positive and negative self-imagery retrieval does affect levels of implicit self-esteem. Consequently,

they suggest that imagery may be able to access and effect unconscious aspects of the self-concept. The lack of clarity between the studies in this area highlights the importance of measuring implicit self-esteem to help provide further insight into how self-imagery effects this aspect of the self-concept.

Another aspect of the self-concept measured in this study is self-concept clarity. This 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). It is proposed that 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 oneself (Baumgardner, 1990). In contrast, uncertainty about the self-concept is associated with low self-esteem, less positive affect towards the self, temporal instability in self-descriptions and lower congruence between perceptions of current and past behaviour (Baumgardner, 1990; Campbell, 1990). Low self-concept clarity is also associated with poor psychological adjustment (Bigler, Neimeyer, & Brown, 2001). Although to date, there are no direct investigations regarding self-concept clarity in individuals with eating disorders, there are several reasons why we would expect it to be low in this population. Firstly, low self-concept clarity is associated with low self-esteem (Campbell, 1990), which as mentioned before, is characteristic of this population. Secondly, the self is a complex entity and is made up of both hypothetical and actual selves (Higgins, 1987). Discrepancies between actual (how you are) and ideal (how you would like to be) selves can interfere with the clarity with which one views oneself (Stopa, 2009). These discrepancies are evident in individuals with eating disorders, which again, is another indication this population is likely to have low levels of clarity about the self. Thirdly, the discrepancy between the two self-esteem systems in individuals with BN is also likely to

create doubt and uncertainty about the self and cause difficulties in maintaining a consistent self-view (Cockerham et al., 2009).

As with explicit self-esteem, Stopa et al. (2011) found that negative self-imagery reduced self-concept clarity, and positive self-imagery increased concept clarity in socially anxious individuals. Where negative self-images are likely to maintain self discrepancies, positive self-imagery may have beneficial effects through reducing the discrepancies between the actual and ideal selves (Stopa et al., 2011). Additionally, if positive self-imagery is associated with increased explicit self-esteem, this will reduce the discrepancy between the two self-esteem systems, which may facilitate a more consistent view of oneself. Considering that low self-concept clarity is associated with poor psychological functioning, it is important to investigate whether the retrieval of differently valenced self-images impacts on this aspect of the self-concept.

Hypotheses

This study aimed to develop the literature regarding the role of self-imagery in the maintenance of eating disorders and explore the utility of a positive self-imagery intervention. This was done by examining the impact of holding differently valenced self-images on two aspects of the self-concept. Individuals with high body dissatisfaction were recruited and asked to identify and hold in mind either a positive or negative image of their body/part of their body.

Given that this was a new area, the first aim was to investigate whether participants would be able to access a positive self-image. Assuming that they could, it was hypothesised that holding negative and positive self-images in mind would be associated with the retrieval of different working self-concepts. The primary hypotheses of this study were therefore:

1. Negative self-image retrieval will be associated with a negative working self-concept, demonstrated by an increase in negative explicit self-esteem, a decrease in positive explicit self-esteem and a reduction in self-concept clarity.
2. Positive self-image retrieval will be associated with a positive working self-concept (increased explicit positive self-esteem, reduced negative self-esteem and improved self-concept clarity).

Given the inconsistent findings regarding implicit self-esteem, it was possible to make a directional hypothesis regarding the impact self-imagery may have on this aspect of the self-concept. Therefore, this study aimed to explore whether manipulating self-imagery impacts on implicit self-esteem in this population.

Individuals were asked to retrieve an image of their body, therefore, as a secondary hypothesis it was predicted that negative self-imagery retrieval would be associated with increased body dissatisfaction, increased negative affect and reduced positive affect. In contrast, positive self-image retrieval was hypothesised to be associated with improvements on these measures.

Sub-Clinical Pilot

As an extension of the above design, this study also investigated the use of positive self-imagery in a sub-clinical population to explore its potential clinical utility. After it was determined that the analogue population could access and retrieve a positive self-image, a small group of individuals who reported high body dissatisfaction and features of BN were recruited and asked to retrieve a positive self-image of their body.[12] In accordance with the experimental study above, it was hypothesised that the retrieval of

[12] Participants in this pilot were not asked to retrieve a negative self-image due to ethical reasons.

this positive self-image would be associated with improvements in self-concept, body satisfaction and affect.

Method

Design

Both the experimental and pilot study consisted of a two part design. Part one involved completing screening questionnaires to assess suitability and part two involved completing the experimental intervention. The mean length of time from screening to completion of part two was 9.6 days (Range = 0-20 days) for the experimental study and 9.1 days (Range = 2-16 days) for the sub-clinical pilot.

The main experimental study employed a 2(Image Valence [positive and negative self-image]) x 2(Time [baseline and post intervention]) mixed design, with the former being a between subjects variable and the latter a within subjects variable. The pilot study employed a within subjects design (time [baseline and post intervention]).

Inclusion Criteria

In order to recruit individuals with high body dissatisfaction and identify participants for the sub-clinical pilot group, the following screening measures were uploaded to an electronic survey database (accessed via a hyperlink). All potential participants were asked to complete these measures to assess their suitability for the study.

Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987). The BSQ is a 34-item trait self-report measure of concerns about body shape. It has been tested on clinical and non-clinical populations and has good concurrent and discriminant validity (Cooper et al., 1987). It was anticipated that most of the participants would be university students and consequently inclusion cut-offs were based on one standard deviation above the mean for a student population (M = 71.9, SD = 23.6; Cooper et al., 1987). Therefore, participants who obtained a total score above 95 on the BSQ

were invited to participate in the experimental session. The BSQ demonstrated high internal consistency in the experimental (α = .86) and pilot (α = .90) groups.

Eating Disorder Examination-Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 1994). The EDE-Q is a self-report version of the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), which is an investigator-based interview. The EDE-Q generates frequency data on key behavioural features of eating disorders (e.g., number of episodes of the behaviour) and subscale scores reflecting the severity of eating disorder psychopathology (Fairburn, 2008). The subscales are restraint, eating concern, shape concern and weight concern. To obtain a 'global' EDE-Q score the four subscale scores are summed and divided by the number of subscales. Validation against the EDE shows that the EDE-Q is an effective screening instrument for detecting the presence of eating disorders in various clinical and high-risk populations (Fairburn & Beglin, 1994; Black & Wilson, 1996).

The EDE-Q was used to identify participants eligible for the pilot study. In order to recruit individuals who could be considered similar to a BN population, inclusion cut-offs were based on one standard deviation above the mean for a community sample (*M* = 1.55, *SD* = 1.21; Fairburn & Beglin, 1994). Evidence of engaging in the behaviours characteristic of BN in the last month was also required. Therefore, participants who met the following criteria were invited to take part in the experimental session of the pilot group:

- Scored above 95 on the BSQ
- Obtained a global EDE-Q score above 2.7
- Reported experiencing more than one episode of bingeing in the last 28 days
- Reported engaging in more than one compensatory behaviour in the last 28 days

The EDE-Q demonstrated good internal consistency in the pilot group (α = .78). At screening, the pilot group scored significantly higher on the BSQ (*M* = 143.36, *SD* = 20.11) and the EDE-Q (*M* = 3.87, *SD* = 0.72) than the experimental group (*M* = 121.06, *SD* = 16.29; *M* = 2.66, *SD* = 0.83, respectively), $t(92) = 5.65$, $p < .001$, $r = .51$, and $t(92) = 6.79$, $p < .001$, $r = .58$, respectively.

Participants

262 participants completed the online screening questionnaires (study adverts in Appendix B). Of these, 138 met the criteria for part two of the study and were invited to participate in this session. In total, 69 participants, recruited from a university population (staff and students), completed the main experimental study. However, three participants were excluded from the study for the following reasons. Two participants (one from each condition) were unable to generate the image required by the condition they were allocated to. The third participant (positive condition) retrieved an image that was associated with getting a diagnosis of a severe medical condition. Given that the participant primarily focused on the medical condition during the interview, it was decided that this activated a negative rather than a positive working self-concept. This was further supported by the participant reporting after the session that they found it hard to hold onto the positive image they initially retrieved due to the other memories it evoked. The final sample therefore consisted of 66 female participants aged 18-27 (*M* = 19.95, *SD* = 1.94). Participants were randomly assigned to either the positive (*n* = 33) or negative (*n* = 33) self-imagery condition.

Of the 138 participants who were eligible for part two of the study, 39 met the criteria for the sub-clinical pilot. Of these, 29 completed part two. However, one participant was excluded from the analysis because the researcher and their supervisor decided the retrieved self-image was not ‘healthy’. It was from a time when the

participant had been underweight which caused her to become nostalgic about not being underweight anymore[13]. The final sample therefore consisted of 28 female participants, who were aged 18-53 (M = 22.07, SD = 6.55). Participants were given either course credit or payment for their participation.[14] A recruitment diagram is included in Appendix C.

Descriptive Measures

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989). The RSES is a 10 item self-report scale of explicit self-esteem. Item scores range from 1 (*strongly agree*) to 4 (*strongly disagree*) and scores can range from 10-40, with higher scores indicating higher self-esteem, once items 3, 5, 8, 9 and 10 have been reversed scored (Robins, Hendin, & Trzesniewski, 2001). The RSE demonstrates good internal reliability (α = .92; Corcoran & Fischer, 1987) and test-retest reliability for six months (.82; Murrell, Meeks, & Walker, 1991). The RSE demonstrated high internal consistency in both the experimental (α = .86) and pilot (α = .92) groups. Participants completed the RSE at the beginning of the experimental session to ensure that levels of trait self-esteem were comparable across the two experimental conditions.

Self-Concept Outcome Measures

State Self-Esteem Scale (SSES; McFarland & Ross, 1982). The SSES is a 12-item measure of explicit state self-esteem. The SSES consists of the 12 items that loaded onto one self-esteem factor in McFarland and Ross's (1982) factor analysis: proud, competent, confident, smart, resourceful, effective, efficient, inadequate, incompetent, stupid, worthless and ashamed. Participants use an 11 point likert scale (1 *not at all*, 11

[13] The implications of this are discussed in more detail in the discussion.

[14] Course credit consisted of one credit for part one, four for part two and payment consisted of £1.50 for part one, £6 for part two.

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). McFarland and Ross (1982) report that the scale is reliable, and it was used in this study to measure state self-esteem at baseline and post imagery intervention. The positive and negative subscales demonstrated high internal consistency within the experimental (baseline: $\alpha = .90$, post: $\alpha = .94$ and baseline: $\alpha = .89$, post: $\alpha = .94$ respectively) and pilot (baseline: $\alpha = .89$, post: $\alpha = .86$ and baseline: $\alpha = .85$, post: $\alpha = .86$ respectively) groups.

Implicit Association Test – The self-esteem IAT (SE-IAT; Greenwald & Farnham, 2000). The SE-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’ and ‘not me’, ‘pleasant’ and ‘unpleasant’. The words used in each category are listed in Table 3. These were taken from a previous study which assessed implicit self-esteem in individuals with BN (Cockerham et al., 2009).

Table 3

Words Used in the Implicit Association Test to Represent Each Concept Category

Me	Not Me	Pleasant	Unpleasant
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 underlying assumption of the IAT is that congruent stimuli are responded to more quickly than 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 are proposed to reflect more positive implicit self-esteem. In comparison, stronger associations between self + unpleasant words (and therefore a negative IAT-D effect score) are proposed to reflect more negative implicit self-esteem (Greenwald, McGhee, & Schwartz, 1998; Greenwald et al., 2003). The IAT measure of implicit self-esteem has reasonable psychometric properties; it is reported to have 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 seven blocks of trials which are shown in Table 4.

Table 4

Structure of the IAT Practice and Test Blocks

Block	Function	Item assigned to the left key response	Item assigned to right key response
1: 24 Trials	Practice	Not me words	Me words
2: 24 Trials	Practice	Unpleasant words	Pleasant words
3: 24 Trials	Practice	Not me words + Unpleasant words	Me words + Pleasant words
4: 48 Trials	Test	Not me words + Unpleasant words	Me words + Pleasant words
5: 24 Trials	Practice	Me words	Not me words
6: 24 Trials	Practice	Me words + Unpleasant words	Not me words + Pleasant words
7: 48 Trials	Test	Me words + Unpleasant words	Not me words + Pleasant words

The presentation of blocks three and four and six and seven were counterbalanced within groups of participants to avoid order effects (Farnham, Greenwald, & Banaji, 1999). In each block respondents classified words into categories by pressing one of two keys. They were instructed to do 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. 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. The IAT was designed using Presentation (Version 14.2) and was presented on a laptop (Acer; TravelMate 8200). The task lasted approximately eight minutes and it was administered post the imagery manipulation to measure differences in implicit self-esteem between conditions.

State Self-Concept Clarity Scale (State-SCCS; Nezlek & Plesko, 2001). The State-SCCS is a four item state measure of self-concept clarity. It helps assess the extent to which self-beliefs are clearly and confidently defined. It consists of items 1, 4, 8 and 9 of the original Self-Concept Clarity Scale (Campbell et al., 1996). Respondents are asked to indicate how much they currently 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). The state-SCCS was administered before and after the imagery intervention to measure changes in self-concept clarity. The internal consistency of the measure in the experimental (baseline: $\alpha = .69$, post: $\alpha = .78$) and pilot (baseline: $\alpha = .71$, post: $\alpha = .85$) groups was acceptable.

Body Satisfaction and Affect Outcome Measures

State Body Satisfaction Scale. There are currently no published state body satisfaction scales; therefore, a single question was used to measure this concept for the purposes of this research. Participants were asked 'How satisfied are you with your body right now?' and reported their answer on a 10 point likert scale (0 *not at all satisfied,* 10

extremely satisfied). Participants were given this measure before and after the imagery intervention.

Positive And Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a self-report measure of state positive and negative affect. The scale consists of 20 items[15] 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. Two subscales can then be calculated by summing positively and negatively worded items separately to obtain a score of positive and negative mood. The scale has good reliability and validity (Watson et al., 1988). Participants completed the scale before and after the imagery intervention to measure changes in state positive and negative mood following the manipulation. The positive and negative subscales demonstrated high internal consistency in both the experimental (baseline: $\alpha = .90$, post: $\alpha = .94$ and baseline: $\alpha = .90$, post: $\alpha = .89$ respectively) and pilot (baseline: $\alpha = .91$, post: $\alpha = .91$ and baseline: $\alpha = .91$, post: $\alpha = .80$ respectively) groups. Copies of the four outcome questionnaires are included in Appendices D-G.

Experimental Task: Imagery Manipulation

The imagery script used by Hulme et al. (2012), which was originally developed by Hirsch, Meynen and Clark (2004), was adapted to create a script that helped participants access a positive or negative self-image based on their body. Once participants identified a time they felt positive or negative about their body they were asked to close their eyes and describe in detail the image they were holding. The researcher then asked questions about the emotions and feelings towards the self the

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

image evoked. At the end of the imagery manipulation participants were instructed to keep the image in mind whilst they completed the post measures. To ensure that the imagery interview elicited the desired image it was initially piloted on six psychology undergraduate students who met the study inclusion criteria. Small adaptations to the interview were made after the pilot (final scripts are in Appendices H-I).

Manipulation Checks

During the imagery interview participants were asked to rate 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 to be less than 60, they were asked for more details about the image to increase its vividness. During the script participants were also asked to rate how positive/negative the image was on a scale of 0 (*not at all positive/negative*) to 100 (*extremely positive/negative*). Finally, at the end of the experimental session participants were asked to rate 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*).

Materials

All participants met the researcher in a research lab at the local university. In addition to the paper measures, a laptop was used to administer the IAT and a Sony (ICD-UX522) Dictaphone was used to record the self-imagery interviews for control purposes.

Procedure

Interested participants were asked to follow a hyperlink to the online screening questionnaires. Responses were sent automatically to a database which could only be accessed by the researcher. Participants who met either inclusion criteria were then invited via email to attend the experimental session. If participants met the criteria for the main experimental study they were randomly allocated to either the positive or negative

imagery condition. An internet based computer programme was used to achieve this random allocation (radomizer.org). Participants who met the pilot criteria were only allocated to the positive imagery condition.

At the beginning of the experimental session participants were given a copy of the information sheet (Appendix J) and completed the consent form (Appendix K). Participants then completed the RSE, state body satisfaction scale, SSES, state-SCCS and the PANAS. The questionnaires were counterbalanced to control for order effects. After completing the baseline measures participants were guided through the self-imagery interview, which was audio-recorded. After the completion of the imagery interview participants were given the state body satisfaction scale, SSES, state-SCCS and PANAS again, in the counterbalanced order, plus the IAT and the final manipulation check. Participants were then verbally debriefed and given a copy of the debrief statement (Appendix L). Given the possible distressing impact of the imagery intervention, a neutral imagery exercise was offered to all participants at the end of the session. No participants accepted the offer of this exercise.

Ethics

Ethical approval for the study was granted by the School of Psychology Ethics Committee (Appendix M).

Data Analysis

Experimental group. An a priori power calculation indicated that in order to achieve a power level (1-β) of .85 a total sample size of 60 would be required. Data from 33 participants in the positive and 33 participants in the negative self-imagery condition were included in the final analysis. A series of 2 (Self-Imagery Condition [positive and negative]) x 2 (Time [baseline and post]) mixed ANOVAs were used to analyse all

variables except the positive PANAS[16] 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 Bonferroni adjustment was applied to reduce the chances of making a type one error (Field, 2005).

Sub-clinical pilot. Repeated measures t-tests were used to analyse the data from the 28 participants in this sample.

Statistical analysis was conducted using the Statistical Package for the Social Sciences, version 20. A minimum statistical level of .05 was set for all tests. To increase clarity, the results section reports the results from the experimental and pilot data analysis separately.

[16] An ANCOVA was used for this analysis for the reasons detailed below.

Results: Experimental Study

Data Screening

To ensure the assumptions of parametric tests were met, data was screened for normality of distribution and homogeneity of variance. The protocol used for data screening also looked for missing values[17] and outliers. Where data did not meet the assumptions, log, square root, inverse or square transformations were undertaken (Field, 2005).

Transformation did not result in a normal distribution on two of the measures (RSE and the 'percentage of time held in mind' manipulation check). ANOVAs are reported to be robust tests, even when assumptions are violated (Howell, 2004). Therefore, they were still used to analyse the data. However, the effect these violations may have had were kept in mind whilst interpreting the data and duel analyses were performed on the measures stated above to check that no differences were evident when transformed or raw data was used in the analysis.[18]

Descriptive statistics

Table 5 shows the age composition of the two conditions and the mean scores and standard deviations for all the measures at baseline.

A series of independent t-tests demonstrated that there were no significant differences between the conditions on any of the measures before the intervention (*p* values ranged from .318 to .905). The two conditions also did not differ significantly in

[17] Mean substitution was used when missing values were identified.

[18] Where transformed data was used, means and standard deviations represent untransformed data to increase clarity.

age, $t(64) = .951$, $p = .345$. These findings suggest that there were no differences between the two conditions prior to the imagery manipulation.

Table 5

Mean Baseline Scores and Standard Deviations (in parenthesis) for each Self-Imagery Condition.

	Self-Imagery Condition	
	Positive (*n* = 33)	Negative (*n* = 33)
Age	20.18 (2.21)	19.73 (1.63)
RSE	18.29 (3.16)	17.00 (5.11)
BSQ	119.27 (17.70)	122.85 (14.80)
Baseline State Positive SE	41.58 (8.33)	42.30 (11.11)
Baseline State Negative SE	19.15 (7.90)	19.42 (10.44)
Baseline State Self-Concept Clarity	13.65 (3.48)	13.27 (2.89)
Baseline State Body Satisfaction	3.99 (1.32)	3.88 (1.77)
Baseline State Positive Affect	29.73 (7.13)	28.79 (8.03)
Baseline State Negative Affect	16.82 (7.88)	14.67 (4.10)

Imagery Manipulation Checks

There was no significant difference between the positive (M = 80.91, SD = 13.20) and negative (M = 86.73, SD = 12.87) condition on the vividness of the self-image retrieved, $t(64) = -1.81$, $p = .074$. There was also no significant difference between the conditions on the reported valence strength of the retrieved image, $t(64) = 1.71$, $p = .093$. Participants in the positive and negative condition rated their retrieved self-image as equally positive (M = 84.15, SD = 9.97) or negative (M = 79.00, SD = 13.27) respectively.

The analysis did demonstrate that the percentage of time participants were able to hold the image in mind during the post questionnaires varied; participants in the positive condition reported holding the image in mind significantly less (M = 63.79 , SD =15.41) than those in the negative condition (M = 78.64, SD = 9.21), t(56.99) = -4.74, p < .001. In order to control for this difference, the following protocol was used:

1. A bivariate correlation between all dependent variables and the percentage manipulation measure was performed for each condition. There were two significant correlations between the dependent variables and the manipulation check in the positive condition: post positive self-esteem (SSES) and post positive affect (PANAS) (r = .35, p = .046; r = .54, p = .001 respectively).

2. Two separate analyses of covariance (ANCOVAs) were used to analyse the SSES and PANAS to help control for the effect of the manipulation check. Results of the SSES ANCOVA indicated that there was no main effect of the manipulation check, F(1,63) = 2.12, p = .151, partial η^2 = .033, and no significant interaction between this measure and time, F(1,63) = 0.19, p = .66, partial η^2 = .003. Furthermore, there was no difference between ANCOVA and ANOVA results on the SSES measure. Therefore the latter was used to analyse the data. Results of the positive PANAS ANCOVA indicated that there was a main effect of the manipulation check on this measure, F(1, 63) = 8.55, p = .01, partial η^2 = .12. Consequently an ANCOVA was used to analyse the results of the positive PANAS[19].

[19] 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. Results of the ANCOVA were also comparable to those of the ANOVA (F values and error values) for all DVs and no differences were found.

Self-Concept Measures

Explicit positive state self-esteem. There was a main effect of condition, $F(1,64) = 10.39$, $p = .002$, partial $\eta^2 = .14$ and a significant time by condition interaction, $F(1,64) = 95.10$, $p < .001$, partial $\eta^2 = .60$ (illustrated in Figure 2). However, there was no main effect of time, $F(1,64) = 3.25$, $p = .076$, partial $\eta^2 = .05$. Investigation of the interaction indicated that positive self-esteem significantly decreased after the intervention in the negative condition, $t(32) = 8.25$, $p < .001$, $r = .82$, and significantly increased post intervention in the positive condition, $t(32) = -5.57$, $p < .001$, $r = .70$. The positive imagery condition also reported significantly higher levels of positive self-esteem after the intervention compared to the negative condition, $t(64) = 6.06$, $p < .001$, $r = .60$.

ANOVAs were therefore used for all measures (except the positive PANAS, for the reasons stated above) because the results of the ANCOVAs suggest that differences between the groups on the manipulation check cannot account for the results found on the DVs.

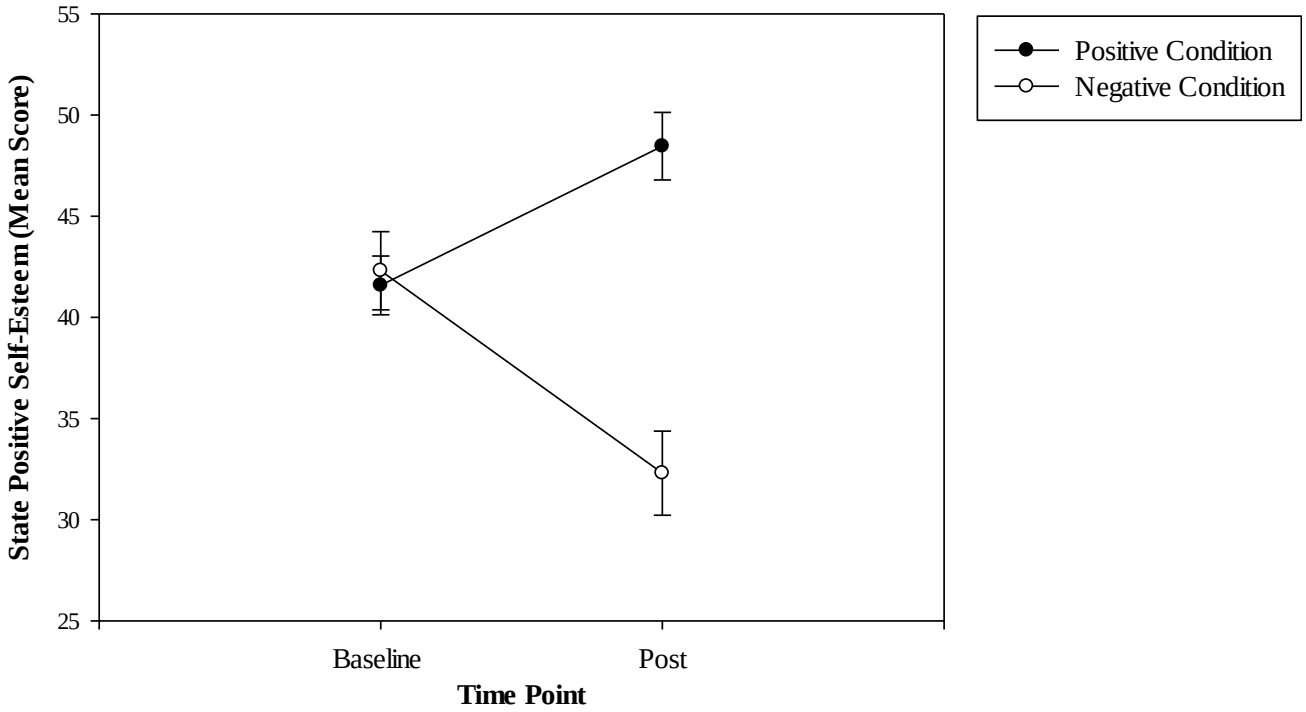


Figure 2. Mean Baseline and Post State Positive Self-Esteem Scores for the Positive and Negative Self-Imagery Conditions.

Explicit negative state self-esteem. There was a main effect of condition, $F(1,64) = 12.21$, $p = .001$, partial $\eta^2 = .16$ and a significant Time x Condition interaction on this measure, $F(1.64) = 62.20$, $p < .001$, partial $\eta^2 = .49$ (illustrated in Figure 3). There was no main effect of time, $F(1,64) = 3.35$, $p = .072$, partial $\eta^2 = .05$. Investigation of the interaction indicated that levels of negative self-esteem significantly increased after the imagery intervention in the negative condition, $t(32) = -6.18$, $p < .001$, $r = .74$ and significant decreased post intervention in the positive condition, $t(32) = 4.90$, $p < .001$, $r = .65$. The negative condition also reported significantly higher levels of negative self-esteem after the intervention compared to the positive condition, $t(64) = -6.21$, $p < .001$, $r = .61$.

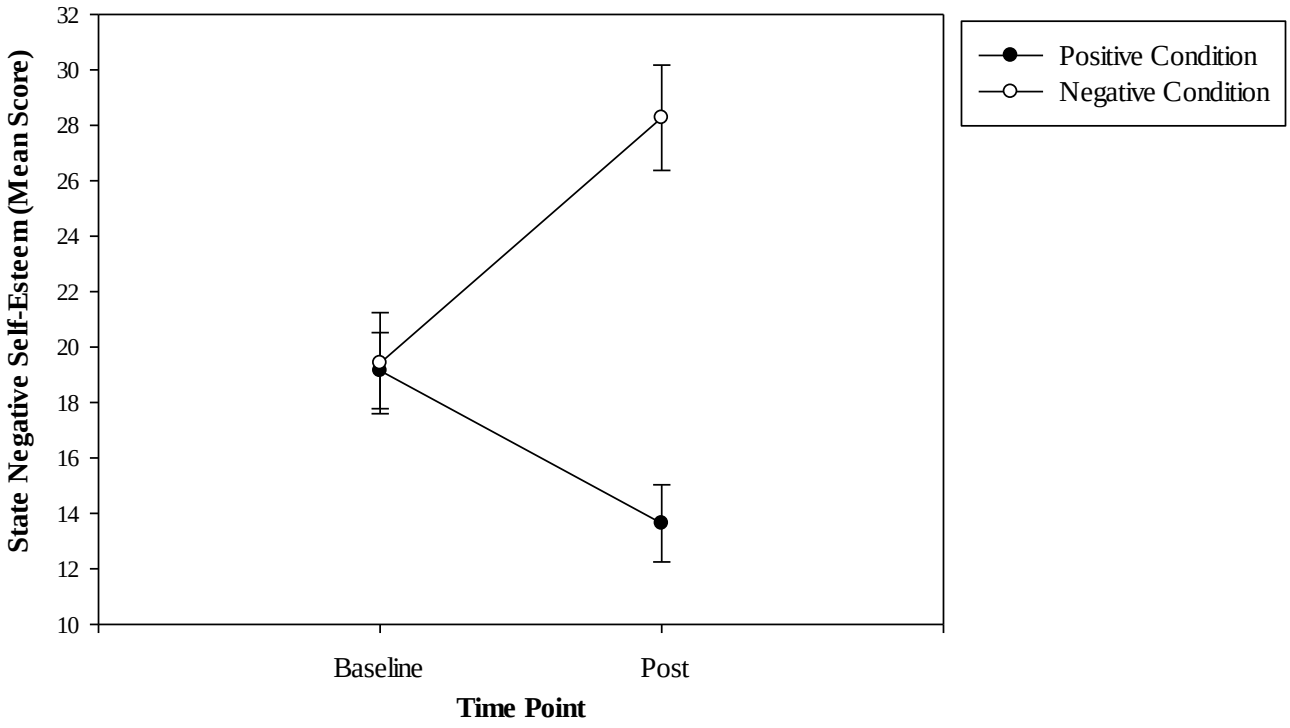


Figure 3. Mean Baseline and Post State Negative Self-Esteem Scores for the Positive and Negative Self-Imagery Conditions.

Implicit self-esteem. The IAT was scored using Greenwald et al's. (2003) improved algorithm. Data from blocks 3, 4, 6 and 7 were used. The improved 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 this 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 (practice incongruent block - practice congruent block and test incongruent block - test congruent block). The resulting scores

were divided by the pooled standard deviations and then averaged to get the IAT-D effect score.

Both conditions demonstrated a positive implicit self-esteem bias. An independent t-test showed that there was no significant difference between the positive (M = 0.48, SD = 0.31) and negative (M = 0.47, SD = 0.36) condition on levels of implicit self-esteem post imagery intervention, $t(64) = .098$, $p = .922$, $r = .01$.

State self-concept clarity. There were no main effects of time, $F(1,64) = 0.10$, $p = .757$, partial $\eta^2 = .002$ or condition, $F(1,64) = 0.37$, $p = .543$, partial $\eta^2 = .006$ on state-SCC. However, there was a significant Time x Condition interaction, $F(1,64) = 6.55$, $p = .013$, partial $\eta^2 = .09$. Investigation of this interaction indicated that levels of state-SCC significantly reduced after the imagery intervention in the negative condition, $t(32) = -2.83$, $p = .008$, $r = .45$. However, there was no significant difference between baseline and post SCC scores in the positive condition, $t(32) = 1.55$, $p = .130$, $r = .26$. There was also no significant difference between the two conditions post intervention on this measure, $t(58.8) = -1.93$, $p = .06$, $r = .24$.

State Body Satisfaction Measure

There were significant main effects of time, $F(1,64) = 7.24$, $p = .009$, partial $\eta^2 = .10$ and condition, $F(1,64) = 26.25$, $p < .001$, partial $\eta^2 = .29$, and a significant Time x Condition interaction, $F(1,64) = 110.30$, $p < .001$, partial $\eta^2 = .63$. Post hoc analyses indicated that state body satisfaction significantly increased after the self-imagery intervention in the positive condition, $t(32) = -7.48$, $p < .001$, $r = .80$. In contrast, body satisfaction significantly decreased after the intervention in the negative condition, $t(32) = 8.29$, $p < .001$, $r = .83$. The positive condition also reported significantly more body satisfaction compared to the negative condition post-intervention, $t(64) = 8.55$, $p < .001$, $r = .73$.

Affect Measures

State Positive Affect Scale. A mixed ANCOVA indicated that there was a significant main effect of condition on positive affect, $F(1, 63) = 24.20$, $p < .001$, partial $\eta^2 = .28$, and a significant Time x Condition interaction, $F(1,63) = 47.51$, $p < .001$, partial $\eta^2 = .43$. There was also a significant main effect of the covariate (manipulation check), $F(1, 63) = 8.55$, $p = .005$, partial $\eta^2 = .12$. However, there was no main effect of time, $F(1,64) = 0.57$, $p = .453$, partial $\eta^2 = .01$, and no significant Time x Manipulation check interaction, $F(1,64) = 0.42$, $p = .521$, partial $\eta^2 = .01$. Post hoc comparisons showed that levels of positive affect significantly decreased after the imagery intervention in the negative condition, $t(32) = 6.62$, $p < .001$, $r = .76$. In comparison, participants in the positive condition reported a significant increase in positive affect after the intervention, $t(32) = -4.69$, $p < .001$, $r = .64$, and had significantly higher levels of positive affect than those in the negative condition post-intervention, $t(64) = 6.28$, $p <. 001$, $r = .62$.

State Negative Affect Scale. A mixed ANOVA indicated that there were significant main effects of condition, $F(1,64) = 5.58$, $p = .021$, partial $\eta^2 = .08$, and time, $F(1,64) = 7.46$, $p = .008$, partial $\eta^2 = .10$, and a significant Time x Condition interaction, $F(1, 64) = 33.95$, $p < .001$, partial $\eta^2 = .35$. Post hoc tests demonstrated that there was a significant increase in negative affect after the intervention in the negative condition, $t(32) = -6.21$, $p < .001$, $r = .74$. In comparison, there was no significant difference between baseline and post intervention levels of negative affect in the positive condition, $t(32) = 1.78$, $p = .084$, $r = .30$. However, participants in the positive condition did report significantly lower negative affect than those in the negative condition post intervention, $t(55.6) = -4.34$, $p < .001$, $r = .50$.

Sub-Clinical Pilot Data

Data Screening

In accordance with the assumptions of repeated measures t-tests, the data on all measures were screened for normality of distribution. All measures except the negative PANAS were normally distributed. Log transformation resulted in the normal distribution of this measure.[20]

Descriptive Statistics

Table 6 shows the descriptive statistics for the screening measures (BSQ, EDE-Q and RSE) completed by the pilot group. Table 7 shows the descriptive statistics for all dependent variables at baseline and post intervention.

[20] Mean substitution was also used for any missing data values.

Table 6

Descriptive Statistics for the Screening Measures

	Mean (SD)	Median	Minimum	Maximum
BSQ	143.36 (20.11)	142.00	98.00	195.00
EDE-Q	3.87 (0.72)	3.95	2.8	5.2
RSE	15.32 (5.21)	14.50	8.00	28.00

Table 7

Descriptive Statistics for all Dependent Variables at Baseline and Post Intervention for the Sub-Clinical Pilot Population

	Mean (SD)	Median	Minimum	Maximum
Baseline State Positive SE	37.18 (10.04)	38.00	24.00	55.00
State Positive SE POST	44.64 (9.75)	44.50	24.00	59.00
Baseline State Negative SE	25.89 (8.70)	26.50	8.00	40.00
State Negative SE POST	17.18 (7.34)	18.00	5.00	32.00
Baseline State SCC	15.07 (3.27)	15.25	9.00	20.00
State SCC POST	14.53 (4.04)	14.50	5.00	20.00
IAT D Effect	0.39 (0.38)	0.38	-0.43	0.95
Baseline State Body Satisfaction	2.50 (1.53)	2.00	0	6.00
State Body Satisfaction POST	4.86 (2.05)	4.50	0	8.00
Baseline State Positive Affect	25.25 (7.43)	23.00	13.00	42.00
State Positive Affect POST	32.89 (7.54)	34.00	18.00	48.00
Baseline State Negative Affect	19.75 (8.82)	18.00	10.00	46.00
State Negative Affect POST	14.93 (4.50)	13.50	10.00	25.00

Manipulation Checks

Descriptive statistics demonstrated that participants in the pilot group rated the retrieved image as extremely vivid (M = 86.07, SD = 9.27), as very positive (M = 84.11, SD = 10.10), and they were able to hold the image in mind for a relatively large percentage of the time whilst completing the post questionnaires (M = 67.32, SD = 19.03).

Self-Concept Measures

The results mirror those found in the positive self-imagery condition above. Repeated measures t-tests demonstrated that there was a significant increase in state positive self-esteem, $t(27) = -5.03$, $p < .001$, $r = .70$, and a significant decrease in state negative self-esteem, $t(27) = 6.61$, $p < .001$, $r = .79$, post intervention. In accordance with the results of the positive condition, there was no significant difference in levels of self-concept clarity from baseline to post intervention, $t(27) = 1.11$, $p = .276$, $r = .21$. The mean IAT score indicates a positive implicit self-esteem bias in the pilot group (M = 0.39, SD = 0.38) and there was no significant difference between the IAT-D effect scores of the positive, negative and pilot groups, $F(2,93) = 0.62$, $p = .54$.

Body Satisfaction and Affect Measures

The results on these measures are also similar to those found in the positive self-imagery experimental condition. There was a significant improvement in body satisfaction post imagery intervention, $t(27) = -6.53$, $p < .001$, $r = .78$. Additionally, there was a significant increase in state positive affect, $t(27) = -6.43$, $p < .001$, $r = .78$, and a significant decrease in state negative affect, $t(27) = 4.15$, $p < .001$, $r = .62$.

Discussion

This study had two main aims. The first aim was to investigate whether individuals with high body dissatisfaction could access a positive self-image. With the exception of one (who was excluded), all participants in both the experimental and sub-clinical pilot study were able to access an image of themselves related to a time they felt happy about their body or part of their body. The second aim of this study was to investigate the effects of manipulating negative and positive self-imagery on two aspects of the self-concept, namely state self-esteem and state self-concept clarity. In accordance with the hypotheses, holding a negative self-image in mind led to a significant decrease in explicit positive self-esteem and a significant increase in explicit negative self-esteem. In comparison, holding a positive self-image in mind was associated with a significant increase in positive explicit self-esteem and a significant decrease in explicit negative self-esteem. In contrast to the explicit self-esteem findings, the two groups did not differ in levels of implicit self-esteem after the imagery intervention. Also in support of our hypothesis, holding a negative image in mind resulted in a significant reduction in self-concept clarity; however, contrary to our prediction, positive self-imagery had no significant effect on this element of the self-concept.

In accordance with the secondary hypotheses, 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 condition. Importantly, the beneficial effects of positive self-imagery on state explicit self-esteem, body satisfaction and affect were also demonstrated in the sub-clinical pilot group.

The overall results of this study are in accordance with the proposal that self-images may represent the individual's current working self in the Self Memory System (Conway & Pleydell-Pearce, 2000). In support of the findings in the social anxiety

literature (e.g., Hulme et al., 2012), the retrieval of positive and negative self-images was associated with different working self-concepts (operationalised in terms of self-esteem and self-concept clarity). This is in line with Conway and Pleydell-Pearce's (2000) assertion that the working self is a dynamic entity which is constructed and reconstructed in response to situational demands.

The results of this study also provide insight into the role of self-imagery in BN. The main effect of image valence on explicit self-esteem suggests that negative self-imagery may contribute to the maintenance of this disorder. The retrieval of one negative self-image resulted in a significant reduction in state positive self-esteem and an increase in state negative self-esteem. The recurrent negative self-images reported by individuals with BN (e.g., Somerville et al., 2007) could therefore help to maintain the negative self-view characteristic of this disorder. There are several routes through which this might occur. 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 et al., 1997). Secondly, given the recurrent nature of these negative self-images, individuals are also likely to become trapped in a vicious cycle in which the negative self-image and negative working self-concept both represent, and serve as evidence for, the validity of the other (Hulme et al., 2012). Finally, in accordance with Brewin (2006), the repeated activation of these negative self-representations is likely to further strengthen their accessibility. This in turn will inhibit the retrieval of positive self-representations, which contain information that could potentially challenge and improve the individual's negative self-view. Given the detrimental effects of negative self-imagery on the content of the self-concept reported in this study, future research investigating whether the retrieval of negative self-images do inhibit access to positive self-images would further inform our understanding of the specific role of self-imagery in the maintenance of this

disorder. Additionally, exploring whether negative self-imagery has detrimental effects on the self-concept of a control group (e.g. low body dissatisfaction) would also provide insight into the role of self-imagery in the development as well as the maintenance of low self-esteem in this population.

All three groups in this study demonstrated a positive implicit self-esteem bias post-intervention, and there was no significant difference in the IAT-D effect scores between these groups. The fact that the conscious manipulation of self-imagery retrieval did not affect levels of implicit self-esteem supports the idea that this self-esteem system is relatively stable and results from automatic, non-conscious self-evaluations (Greenwald & Banaji, 1995). The discrepancy between the two self-esteem systems found in the negative condition supports the findings of Cockerham et al. (2009) and also provides insight into the role implicit self-esteem may have in the maintenance of a negative sense of self. The discrepancy between low explicit self-esteem and high implicit self-esteem has been termed 'discrepant low self-esteem' and it is suggested to be indicative of psychological distress (Zeigler-Hill, 2006). As mentioned before, the discrepancy between these two systems has detrimental effects on ones sense of self because it creates doubt and uncertainly about the self, making it difficult to maintain a consistent self-view (Cockerham et al., 2009). This lack of clarity is associated with low self-esteem (Campbell, 1990), which in turn is likely to increase the discrepancy between the two self-esteem systems and result in more uncertainty, thus creating a vicious cycle which maintains a negative and unstable self-view. 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.

In contrast to the results regarding explicit self-esteem, there was only partial support for the hypothesis regarding self-concept clarity. Although, in support of the hypothesis, negative self-imagery was found to reduce clarity, positive imagery did not increase levels of state self-concept clarity. In addition to creating a discrepancy between the two self-esteem systems, another explanation for the results of the negative group is that the retrieval of a negative self-image increases the perceived discrepancy between one's actual and ought/ideal self (Higgins, 1987). This experience of self-discrepancy is likely to cause feelings of uncertainty about the self, which in turn, are likely to contribute to reduced state self-concept clarity (Stopa et al., 2011). As with the findings regarding explicit self-esteem, the repeated activation of such images in individuals with BN may therefore contribute to the maintenance of low self-concept clarity predicted to be characteristic of this disorder.

However, given this interpretation, we would expect that retrieving a positive image would reduce the discrepancy between the actual and ideal self and thus have resulted in an increase in clarity about the self. One reason for the absence of this finding may be because the discrepancy between the ideal and actual self in individuals with high body dissatisfaction has been long-standing, and therefore, a one-off imagery intervention is not sufficient enough to facilitate a reduction in this discrepancy. Different aspect of the self may change at different rates and therefore some may require more repeated exposure before change occurs (Stopa et al., 2012). A future design which examines whether repeated positive self-image retrieval is successful at facilitating a change in self-concept clarity, would help test this hypothesis, and determine whether imagery can modify this aspect of the self-concept. An alternative explanation for this finding could be that the measure of self-concept clarity used in this study was not sensitive enough to detect change. The measure only consisted of four items and therefore a more

comprehensive measure may demonstrate different results. The use of an experimental task (e.g., me/not-me self-description task; Markus, 1977) to measure self-concept clarity in future designs may also help further understand the relationship between self-imagery and this self-construct.

As mentioned in the introduction, although individuals with eating disorders are predicted to have low self-concept clarity due to the relationship between this construct and low self-esteem (Campbell, Chew, & Scratchley, 1991), there is no research to date exploring the nature of self-concept clarity in this population. The explanations above are therefore hypothetical and research is needed to explore this aspect of the self-concept before firm conclusions regarding these findings can be made. Studies utilising the designs suggested above also need to be conducted to help ascertain whether self-concept clarity can be increased through the manipulation of self-imagery.

In accordance with the secondary hypotheses, positive and negative self-imagery impacted on levels of state body satisfaction and state affect. These results suggest that, as well as having detrimental effects on aspects of one's self-concept, negative self-images may have a role in maintaining other primary features of the disorder. Similar to explicit self-esteem, the repeated activation of an image associated with a negative memory of one's body is likely to increase the accessibility of a working self characterised by high body dissatisfaction. Considering how individuals with eating disorders feel and think about their body affects their self-esteem (Cooper, 2009), it makes theoretical sense that changes on these two measures should co-occur. Additionally, given this relationship, the low levels of self-esteem and feelings of body dissatisfaction activated by negative images are likely to maintain each other, leading to increased negative affect, as demonstrated in this study.

Clinical Implications

The results of this study hold some potentially important implications for clinical practice. They suggest that employing techniques which target negative and promote positive self-images may help increase aspects of the self-concept, body satisfaction and affect in individuals with BN. Brewin (2006) proposes that cognitive therapy works by facilitating access to more positive self-representations, which in turn inhibit access to and challenge the negative self-representations. This study has shown that imagery can be a powerful way to access positive self-representations and suggests that incorporating positive self-imagery techniques into eating disorder treatments may help challenge the negative self-view that plays a role in the maintenance of this disorder (Cooper et al., 2004). Support for the use of imagery interventions with this population comes from research demonstrating the effectiveness of imagery rescripting in the modification of core beliefs in individuals with BN (Cooper et al., 2007; Ohanian, 2002). The development and rehearsal of a more positive self-image is part of the imagery rescripting protocol; therefore, the mechanism of change described by Brewin (2006) may help understand the positive effects of this technique. If this is the case, then the positive-imagery intervention described in this study could be used to complement imagery rescripting protocols and thus help facilitate change at the core belief level.

In addition to targeting deep set self-beliefs, positive self-imagery could also be used alongside verbal techniques which address the maintenance of disordered eating behaviour. Given the nature and content of negative self-images in this population, Somerville et al. (2007) have suggested that they are analogous to negative automatic thoughts; which are proposed to play an important role in the maintenance of bingeing and purging behaviour (Cooper et al., 2004). In support of this proposal, individuals with BN report experiencing negative self-images before vomiting (Hinrichsen et al., 2007).

The results of this study suggest that these negative self-images are likely to be associated with low self-esteem, high body dissatisfaction and negative affect, which are all factors that are likely to contribute to the triggering of vomiting behaviour. Helping individuals retrieve an image associated with a more positive self-concept (increased self-esteem, body satisfaction and affect) may therefore help break this maintenance cycle. In sum, the finding that positive self-imagery improves aspects of the self-concept and body satisfaction highlights the potential benefits of using imagery interventions alongside the existing verbal techniques commonly used in treatment protocols (e.g., Fairburn, 2008).

Although the findings reported in this paper highlight the potential clinical utility of the positive self-imagery intervention used in this study, further research is required before firm conclusions can be drawn. Firstly, this paradigm needs to be tested with a clinical population to investigate whether the positive effects of self-imagery still apply. Following this, research needs to investigate at what stage in treatment this intervention could be usefully employed with this population. One participant in the sub-clinical pilot retrieved an image which was considered 'unhealthy' and a negative sense of self was subsequently activated due to feelings of nostalgia. This highlights the need to consider what factors may indicate that individuals are ready to engage in the imagery intervention. Individuals with eating disorders are also often nutritionally unstable at the beginning of treatment, and it remains unclear as to how nutritional status might impact upon image retrieval. Additionally, it could be beneficial to investigate the factors that facilitate the positive effect of this intervention. In particular, exploring whether the vividness of the retrieved image influences effectiveness would help inform whether therapists need to practice accessing imagery with the client before using this technique. Finally, this study investigated the effects of retrieving a positive self-image associated with one's body. Research which explores whether retrieving alternative positive self-

images also results in positive outcomes would further increase our understanding regarding the clinical utility of this intervention. Future research which seeks to replicate the results of this study and investigate these factors would greatly add to our understanding of the role of self-imagery in this population and help determine whether it can enhance existing evidence-based cognitive-behavioural approaches (e.g., Fairburn, 2008).

Limitations

Inevitably this study has a number of limitations that need to be considered. Given that the BSQ and EDE-Q were used as screening measures, it is possible that participants may not have been fully blind to the subject of the study. Additionally, the use of a pre-post design may have provided information regarding the purpose of the study and thus it is possible that some of the results may be affected by demand characteristics. Although this study measured both implicit and explicit self-esteem, limited conclusions can be drawn about the impact of the intervention on implicit self-esteem because no baseline measure of this construct was obtained. It is therefore unclear whether participants in each condition had comparative levels of implicit self-esteem at the beginning of the study and whether imagery did affect levels of this construct. Future research which addresses this issue and also measures other aspects of the self-concept would help gain a more comprehensive understanding regarding the impact of self-imagery on the self-concept. Finally, there was no follow-up to determine whether the positive effects of positive self-imagery were maintained. Future research which investigates this and the effects of repeatedly accessing positive self-imagery would help determine whether this technique can produce sustained changes in aspects of the self-concept and further our insight into its clinical utility.

Conclusion

Despite the limitations mentioned above, the results of this study develop our understanding regarding the role of self-imagery in eating disorders and have potentially important implications for clinical practice. Both individuals with high body dissatisfaction and those with feature of BN are able to access a positive self-image related to their body, and these images have beneficial effects on aspects of the self-concept and levels of body satisfaction. In comparison, the retrieval of a negative self-image is associated with a more negative working self-concept in this population. Although these results need replicating, they suggest that negative self-imagery may play an important role in the maintenance of BN. Additionally, they suggest that incorporating techniques which encourage the retrieval of positive self-imagery into current treatment protocols, may help reduce the negative sense of self characteristic of this clinical population.

References

American Psychiatric Association. (2012). *DSM-5 Development.* Retrieved from http://www.dsm5.org.

Baddeley, A., & Hitch, G. (1974). Working memory. In G. A. Bower (Ed.). *Recent advances in learning and motivation, Vol 8.* (pp. 47-89). New York: Academic Press.

Bagby, R. M., Parker, J. D., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research, 38,* 23–32.

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

Beck, A. T., Freeman, A. M., & Associates. (1990). *Cognitive therapy of personality disorders*. New York: Guilford Press.

Bigler, M., Neimeyer, G. J., & Brown, E. (2001). The divided self revisited: Effects of self-concept clarity and self-concept differentiation on psychological adjustment. *Journal of Social and Clinical Psychology, 20*(3), 396-415. doi: 10.1521/jscp.20.3.396.22302

Black, C. M. D., & Wilson, G. T. (1996). Assessment of eating disorders: Interview versus questionnaire. *International Journal of Eating Disorders, 20*(1), 43-50. doi: 10.1002/(SICI)1098-108X(199607)20:1<43::AID-EAT5>3.0.CO;2-4

Boone, L., Braet, C., Vandereycken, W., & Claes, L. (2013). Are maladaptive schema domains and perfectionism related to body image concerns in eating disorder patients? *European Eating Disorders Review: The journal of the Eating Disorders Association, 21*(1), 45-51. doi: 10.1002/erv.2175

Bosson, J. K., Swann, W. B., Jr., & 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

Bradford, R., & Rutherford, D. (2001). The Eating Disorder Belief Questionnaire: In-patient adolescent scores. *Clinical Child Psychology and Psychiatry, 6*(4), 513-518. doi: 10.1177/1359104501006004005

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

Bricker , D. C., & Young, J. E. (1994). A client's guide to schema-focused therapy. In J. E. Young (Ed.), *Cognitive therapy for personality disorders: A schema-focused approach* (3rd ed.). Sarasota, FL: Professional Resource Press.

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., Chew, B., & Scratchley, L. S. (1991). Cognitive and emotional reactions to daily events: The effects of self-esteem and self-complexity. *Journal of Personality, 59*(3), 473-505. doi: 10.1111/j.1467-6494.1991.tb00257.x

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

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., Cohen-Tovee, E., Todd, G., Wells, A., & Tovee, M. (1997). A questionnaire to assess assumptions and beliefs in eating disorders: Preliminary findings. *Behaviour Research and Therapy, 35*, 381-388. doi: 10.1016/S0005-7967(96)00115-5

Cooper, M. J., & Hunt, J. (1998). Core beliefs and underlying assumptions in bulimia nervosa and depression. *Behaviour Research and Therapy, 36*(9), 895-898. doi: 10.1016/s0005-7967(98)00068-0

Cooper, M. J., Todd, G., & Wells, A. (1998). Content, origins, and consequences of dysfunctional beliefs in anorexia nervosa and bulimia nervosa. *Journal of Cognitive Psychotherapy, 12*(3), 213-230.

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

Cooper, M. J., Wells, A., & Todd, G. (2004). A cognitive model of bulimia nervosa. *British Journal of Clinical Psychology, 43*, 1-16. doi: 10.1348/014466504772812931

Cooper, M. J. (2005). Cognitive theory in anorexia nervosa and bulimia nervosa: Progress, development and future directions. *Clinical Psychology Review, 25*(4), 511-531. doi: 10.1016/j.cpr.2005.01.003

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. 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 US: Routledge/Taylor & Francis Group.

Cooper, M. J., & Cowen, P. (2009). Negative self-beliefs in relation to eating disorder and depressive symptoms: Different themes are characteristic of the two sets of symptoms in those with eating disorders and/or depression. *Journal of Cognitive Psychotherapy, 23*(2), 147-159. doi: 10.1891/0889-8391.23.2.147

Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairburn, C. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders, 6*(4), 485-494. doi: 10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O

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

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

Demo, D. H., & Savin-Williams, R. C. (1992). Self-concept stability and change during adolescence. In R. P. Lipka & T. M. Brinthaupt (Eds.), *Self-perspectives across the life span.* (pp. 116-148). Albany, NY US: State University of New York Press.

Dingemans, A. E., Spinhoven, P., & van Furth, E. F. (2006). Maladaptive core beliefs and eating disorder symptoms. *Eating Behaviors, 7*(3), 258-265. doi: 10.1016/j.eatbeh.2005.09.007

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 US: 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.

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

Fairchild, H., & Cooper, M. J. (2010). A multidimensional measure of core beliefs relevant to eating disorders: Preliminary development and validation. *Eating Behaviors, 11*(4), 239-246. doi: 10.1016/j.eatbeh.2010.05.004

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: Blackwell Publishing.

Field, A. (2005). *Discovering statistics using SPSS (2nd ed.)*. Thousand Oaks, CA US: Sage Publications, Inc.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449–468.

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.

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.

Gongora, V. C., Derksen, J. J. L., & van Der Staak, C. P. F. (2004). The role of core beliefs in the specific cognitions of bulimic patients. *Journal of Nervous and Mental Disease, 192*(4), 297-303. doi: 10.1097/01.nmd.0000120889.01611.2f

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., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480. doi: 10.1037/0022-3514.74.6.1464

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: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197-216. doi: 10.1037/0022-3514.85.2.197

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

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

Henderson, K.A., Buchholz, A., Perkins, J., Norwood, S., Obeid, N., Spettigue, W., & Feder, S. (2010). Eating Disorder Symptom Severity Scale: A new clinician rated measure. *Eating Disorders:The Journal of Treatment & Prevention, 18,* 333-346.

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 US: 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

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

Hirsch, C. R., Clark, D. M., Mathews, A., & Williams, R. (2003). Self-images play a causal role in social phobia. *Behaviour Research and Therapy, 41*(8), 909-921. doi: 10.1016/S0005-7967(02)00103-1

Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory, 12*(4), 496-506. doi: 10.1080/09658210444000106

Hoek, H. W., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorders. *International Journal of Eating Disorders, 34*(4), 383-396. doi: 10.1002/eat.10222

Holmes, E. A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The causal effect of mental imagery on emotion assessed using picture-word cues. *Emotion, 8*(3), 395-409. doi: 10.1037/1528-3542.8.3.395

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

Hughes, M. L., Hamill, M., van Gerko, K., Lockwood, R., & Waller, G. (2006). The relationship between different levels of cognition and behavioural symptoms in the eating disorders. *Eating behaviors, 7*(2), 125-133.

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

Johnson, F., & Wardle, J. (2005). Dietary Restraint, body dissatisfaction, and psychological distress: A Prospective Analysis. *Journal of Abnormal Psychology, 114*(1), 119-125. doi: 10.1037/0021-843X.114.1.119

Jones, C., Harris, G., & Leung, N. (2005). Core beliefs and eating disorder recovery. *European Eating Disorders Review, 13*(4), 237-244. doi: 10.1002/erv.642

Jones, C., Leung, N., & Harris, G. (2007). Dysfunctional core beliefs in eating disorders: A review. *Journal of Cognitive Psychotherapy, 21*(2), 156-171. doi: 10.1891/088983907780851531

Lawson, R., Emanuelli, F., Sines, J., & Waller, G. (2008). Emotional awareness and core beliefs among women with eating disorders. *European Eating Disorders Review, 16*(2), 155-159.

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

Leung, N., Waller, G., & Thomas, G. (1999). Core beliefs in anorexic and bulimic women. *Journal of Nervous and Mental Disease, 187*(12), 736-741. doi: 10.1097/00005053-199912000-00005

Leung, N., Thomas, G., & Waller, G. (2000). The relationship between parental bonding and core beliefs in anorexic and bulimic women. *British Journal of Clinical Psychology, 39 (Pt 2)*, 205-213. doi: 10.1348/014466500163220

Leung, N., Waller, G., & Thomas, G. (2000). Outcome of group cognitive-behavior therapy for bulimia nervosa: The role of core beliefs. *Behaviour Research and Therapy, 38*(2), 145-156. doi: 10.1016/s0005-7967(99)00026-1

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

Luck, A., Waller, G., Meyer, C., Ussher, M., & Lacey, H. (2005). The role of schema processes in the eating disorders. *Cognitive Therapy and Research, 29*(6), 717-732. doi: 10.1007/s10608-005-9635-8

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

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology, 38*, 299-337. doi: 10.1146/annurev.ps.38.020187.001503

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

Meijboom, A., Jansen, A., Kampman, M., & Schouten, E. (1999). An experimental test of the relationship between self-esteem and concern about body shape and weight in restrained eaters. *International Journal of Eating Disorders, 25*(3), 327-334. doi: 10.1002/(SICI)1098-108X(199904)25:3<327::AID-EAT11>3.0.CO;2-5

Meyer, C., & Waller, G. (2000). Subliminal activation of abandonment and eating related schemata: Relationship with eating disordered attitudes in a nonclinical population. *International Journal of Eating Disorders, 27*(3), 328-334. doi: 10.1002/(sici)1098-108x(200004)27:3<328::aid-eat10>3.0.co;2-u

Mizes, J. S., & Klesges, R. C. (1989). Validity, reliability and factor structure of the anorectic cognitions questionnaire. *Addictive Behaviors, 14*, 589-594.

Mountford, V., Waller, G., Watson, D., & Scragg, P. (2004). An experimental analysis of the role of schema compensation in anorexia nervosa. *Eating Behaviors, 5*(3), 223-230. doi: 10.1016/j.eatbeh.2004.01.012

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

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

Padesky, C., & Greensberger, D. (1995). *Clinician´s guide to mind over mood*. New York: Guilford Press.

Pitts, C., & Waller, G. (1993). Self-denigratory beliefs following sexual abuse: Association with the symptomatology of bulimic disorders. *International Journal of Eating Disorders, 13*(4), 407-410. doi: 10.1002/1098-108X(199305)13:4<407::AID-EAT2260130409>3.0.CO;2-7

Pringle, A., Harmer, C. J., & Cooper, M. J. (2010). Investigating vulnerability to eating disorders: Biases in emotional processing. *Psychological Medicine, 40*(4), 645-655. doi: 10.1017/S0033291709990778

Probst, M., Van Coppenolle, H., & Vandereycken, W. (1995). The body attitude test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorder: Journal of Treatment and Prevention, 3,* 133–145.

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

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

Sheffield, A., Waller, G., Emanuelli, F., Murray, J., & Meyer, C. (2005). Links between parenting and core beliefs: Preliminary psychometric validation of the Young Parenting Inventory. *Cognitive Therapy and Research, 29,* 787–802.

Sheffield, A., Waller, G., Emanuelli, F., Murray, J., & Meyer, C. (2009). Do schema processes mediate links between parenting and eating pathology? *European Eating Disorders Review, 17*(4), 290-300. doi: 10.1002/erv.922

Somerville, K., & Cooper, M. J. (2007). Using imagery to identify and characterise core beliefs in women with bulimia nervosa, dieting and non-dieting women. *Eating behaviors, 8*(4), 450-456. doi: 10.1016/j.eatbeh.2006.12.004

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

Spranger, S. C., Waller, G., & Bryant-Waugh, R. (2001). Schema avoidance in bulimic and non-eating disordered women. *International Journal of Eating Disorders, 29*(3), 302-306. doi: 10.1002/eat.1022

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

Stopa, L. (2011). Imagery rescripting across disorders: A practical guide. *Cognitive and Behavioral Practice, 18*(4), 421-423. doi: 10.1016/j.cbpra.2011.05.001

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

Stopa, L., Brown, M. A., & Hirsch, C. R. (2012). The effects of repeated imagery practice on self-concept, anxiety and performance in socially anxious participants. *Journal of Experimental Psychopathology, 3*(2), 223-242. doi: 10.5127/jep.021511

Tatham, M. (2011). The role of imagery-based techniques in cognitive-behavioural therapy for adults with eating disorders. *Clinical Psychology Review, 31*(7), 1101-1109. doi: 10.1016/j.cpr.2011.06.008

Thelen, M. H., Farmer, J., Wonderlich, S., & Smith, M. (1991). A revision of the Bulimia Test: the BULIT-R. *Psychological Assessment, 3*, 119-124.

Turner, H., & Cooper, M. J. (2002). Cognitions and their origins in women with anorexia nervosa, normal dieters and female controls. *Clinical Psychology & Psychotherapy, 9*(4), 242-252. doi: 10.1002/cpp.317

Unoka, Z., Tolgyes, T., & Czobor, P. (2007). Early maladaptive schemas and body mass index in subgroups of eating disorders: A differential association. *Comprehensive Psychiatry, 48*(2), 199-204. doi: 10.1016/j.comppsych.2006.09.002

Unoka, Z., Tolgyes, T., Czobor, P., & Simon, L. (2010). Eating Disorder Behavior and Early Maladaptive Schemas in Subgroups of Eating Disorders. *Journal of Nervous and Mental Disease, 198*(6), 1-7. doi: 10.1097/NMD.0b013e3181e07d3d

van Vreeswijk, M., Broersen, J., & Nadort, M. (2012). *The Wiley-Blackwell Handbook of Schema Therapy: Theory, Research and Practice*. West Sussex: John Wiley & Sons.

Vitousek, K. B., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research, 14*(2), 191-214. doi: 10.1007/BF01176209

Waller, G., Ohanian, V., Meyer, C., & Osman, S. (2000). Cognitive content among bulimic women: The role of core beliefs. *International Journal of Eating Disorders, 28*(2), 235-241. doi: 10.1002/1098-108x(200009)28:2<235::aid-eat15>3.0.co;2-1

Waller, G., Meyer, C., & Ohanian, V. (2001). Psychometric properties of the long and short versions of the Young Schema Questionnaire: Core beliefs among bulimic and comparison women. *Cognitive Therapy and Research, 25*(2), 137-147. doi: 10.1023/A:1026487018110

Waller, G., Meyer, C., Ohanian, V., Elliott, P., Dickson, C., & Sellings, J. (2001). The psychopathology of bulimic women who report childhood sexual abuse: The mediating role of core beliefs. *Journal of Nervous and Mental Disease, 189*(10), 700-708. doi: 10.1097/00005053-200110000-00007

Waller, G., Shah, R., Ohanian, V., & Elliott, P. (2001). Core beliefs in bulimia nervosa and depression: The discriminant validity of Young's Schema Questionnaire. *Behavior Therapy, 32*(1), 139-153. doi: 10.1016/S0005-7894(01)80049-6

Waller, G., Dickson, C., & Ohanian, V. (2002). Cognitive content in bulimic disorders: Core beliefs and eating attitudes. *Eating Behaviors, 3*(2), 171-178. doi: 10.1016/S1471-0153(01)00056-3

Waller, G. (2003). Schema-level cognitions in patients with binge eating disorder: A case control study. *International Journal of Eating Disorders, 33*(4), 458-464.

Waller, G., Cordery, H., Corstorphine, E., Hinrichsen, H., Lawson, R., Mountford, V., & Russell, K. (2007). *Cognitive behavioral therapy for eating disorders: A comprehensive treatment guide*. New York, NY US: Cambridge University Press.

Waller, G., Kennerley, H., & Ohanian, V. (2007). Schema-focused cognitive-behavioral therapy for eating disorders. In L. P. Riso, P. L. du Toit, D. J. Stein & J. E. Young (Eds.), *Cognitive schemas and core beliefs in psychological problems: A scientist-practitioner guide.* (pp. 139-175). Washington, DC US: American Psychological Association.

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

Wells, A. (2000). *Emotional disorders and metacognition: Innovative cognitive therapy*. New York, NY US: John Wiley & Sons Ltd.

Woolrich, R. A., Cooper, M. J., & Turner, H. M. (2006). A preliminary study of negative self-beliefs in anorexia nervosa: A detailed exploration of their content, origins and functional links to 'not eating enough' and other characteristic behaviors. *Cognitive Therapy and Research, 30*(6), 735-748. doi: 10.1007/s10608-006-9024-y

Young, J. (1990). *Cognitive therapy for personality disorders: A schema-focused approach*. Sarasota, FL England: Professional Resource Exchange, Inc.

Young, J.E., & Rygh, J. (1994). Young-Rygh Avoidance Inventory (YRAI). New York: Cognitive Therapy Center. New York. Available: http://www.schematherapy.com.

Young, J. E., & Gluhoski, V. L. (1996). Schema-focused diagnosis for personality disorders. In F. W. Kaslow (Ed.), *Handbook of relational diagnosis and dysfunctional family patterns.* (pp. 300-321). Oxford England: John Wiley & Sons.

Young, J. E. (1998). *The Young Compensatory Inventory.* New York: Cognitive Therapy Center. New York. Available: http://www.schematherapy.com.

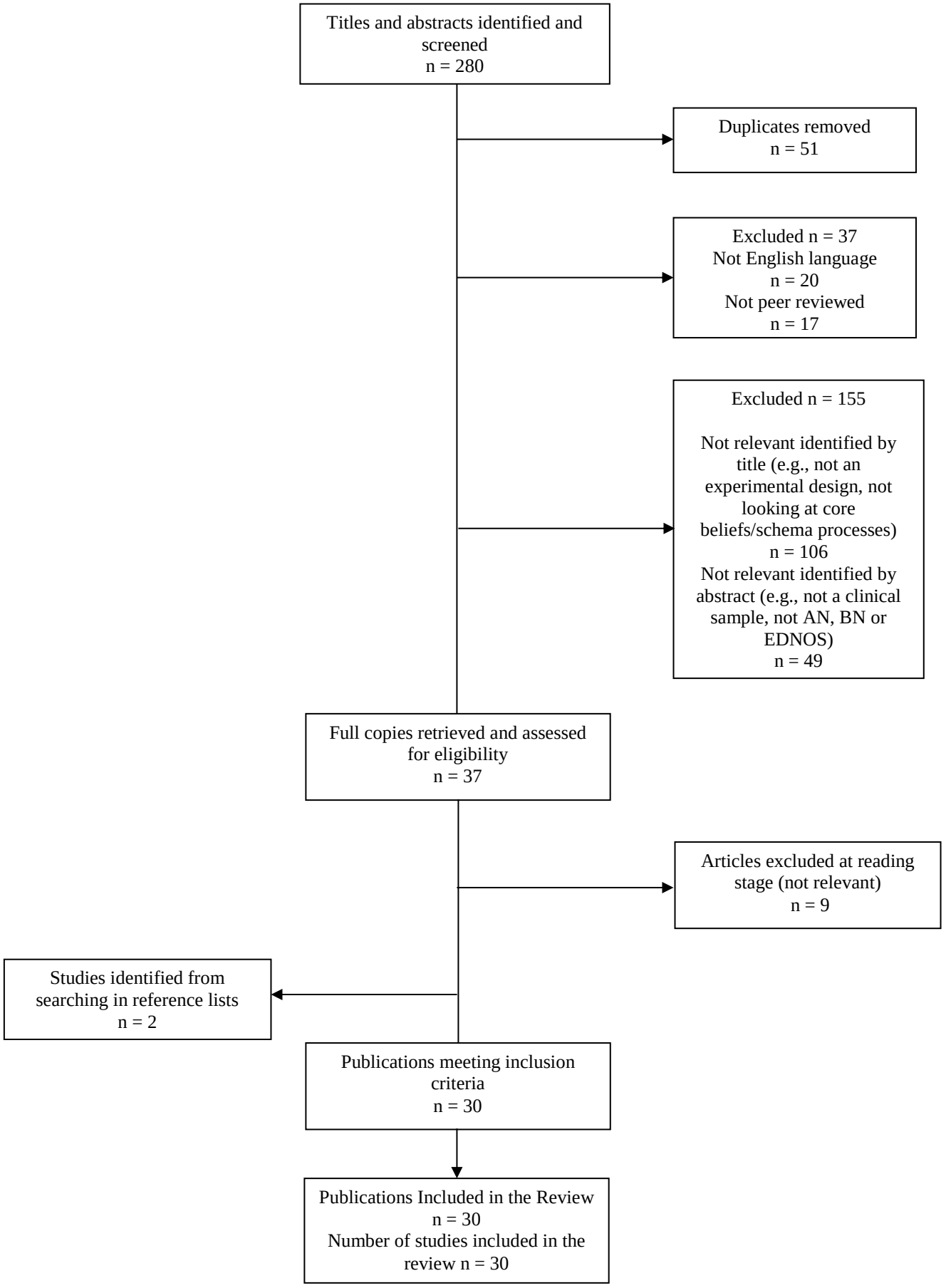
Young, J. E. (1999). *Cognitive therapy of personality disorders: A schema-focused approach* (3rd ed.). Sarasota, FL: Professional Resource Press.

Young, J., Klosko, J., & Weishaar, M. (2003). *Schema therapy: A practitioner's guide*. New York: The Guilford Press.

Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: implications for narcissism and self-esteem instability. *Journal of Personality, 74*(1), 119-143. doi: 10.1111/j.1467-6494.2005.00371.x

Appendices

Appendix A: Flow Diagram Detailing the Systematic Search Process used in the Literature Review


Titles and abstracts identified and screened
n = 280
Duplicates removed
n = 51
Excluded n = 37
Not English language
n = 20
Not peer reviewed
n = 17
Excluded n = 155
Not relevant identified by title (e.g., not an experimental design, not looking at core beliefs/schema processes)
n = 106
Not relevant identified by abstract (e.g., not a clinical sample, not AN, BN or EDNOS)
n = 49
Full copies retrieved and assessed for eligibility
n = 37
Articles excluded at reading stage (not relevant)
n = 9
Studies identified from searching in reference lists
n = 2
Publications meeting inclusion criteria
n = 30
Publications Included in the Review
n = 30
Number of studies included in the review n = 30

Appendix B: Study Adverts

Psychobook Advert

Effects of self-imagery on sense of self and how we feel about our bodies

I am recruiting female volunteers aged between 18 and 65 years old, to participate in my research investigating the effect self-imagery has on how we feel about ourselves and our bodies.

Participation involves you first completing two online questionnaires (15 minutes). If you score within the range we are interested in you will be contacted by the researcher to meet them for a single 1hour session. During this session you will be asked questions about the images you hold about yourself and you will also be asked to complete a set of questionnaires at the beginning and end of this session.

Participants will receive either course credits or cash payment for their time. 1 credit/£1.50 will be given after the completion of the online questionnaires and you will receive this even if you are not invited to the second stage of the study. Participants invited to the second stage will also receive 4 credits/£6 for completing the 1 hour session.

To complete the first stage (online questionnaires) please click on the following link: https://www.isurvey.soton.ac.uk/4995

If you are interested in finding out more please email Stephanie Farrar (sf1g10@soton.ac.uk) to request a copy of the study information sheet.

UNIVERSITY OF Southampton

EFFECTS OF SELF-IMAGERY ON SENSE OF SELF AND HOW WE FEEL ABOUT OUR BODIES

Are you female?

Aged between 18-65?

Then I am interested in hearing from you

I am recruiting volunteers to participate in my research investigating how mental images of ourselves affect how we view ourselves and how we feel about our bodies.

Participation involves you first completing two online questionnaires (15 minutes). If you score within the range we are interested in you will be contacted by the researcher to meet them for a single 1 hour session. During this session you will be asked questions about the images you hold about yourself and you will also be asked to complete a set of questionnaires at the beginning and end of this session.

Payment: you will receive either course credits or cash payment for your time.

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

Participants invited to the second stage will also receive **4 credits/£6** for completing the 1 hour session.

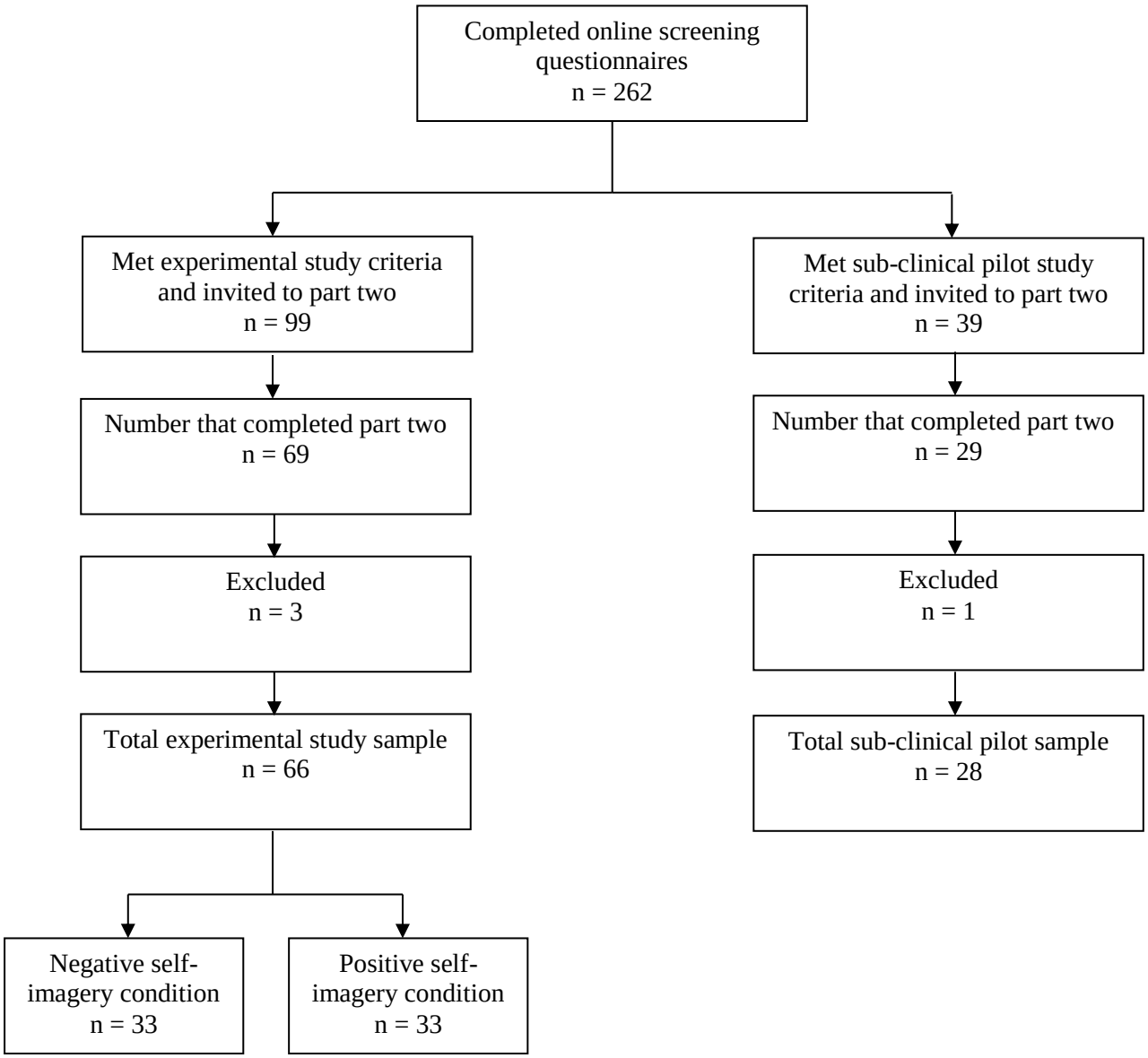
To complete the first stage (online questionnaires) please type in the following web address (also on the tear off strips below): https://www.isurvey.soton.ac.uk/4995 or contact me on sf1g10@soton.ac.uk and I can forward you the link.

If you are interested in finding out more please email Stephanie Farrar (sf1g10@soton.ac.uk) to request a copy of the study information sheet.

Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995

Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995
Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995
Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995
Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995
Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995
Email: sf1g10@soton.ac.uk Part 1: https://www.isurvey.soton.ac.uk/4995

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


Completed online screening questionnaires
n = 262
Met experimental study criteria and invited to part two
n = 99
Met sub-clinical pilot study criteria and invited to part two
n = 39
Number that completed part two
n = 69
Number that completed part two
n = 29
Excluded
n = 3
Excluded
n = 1
Total experimental study sample
n = 66
Total sub-clinical pilot sample
n = 28
Negative self-imagery condition
n = 33
Positive 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 (State-SCCS; 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: State Body Satisfaction Scale

State Body Dissatisfaction Scale

How satisfied are you with your body right now?

Not at all Satisfied | Moderately Satisfied | Extremely Satisfied

0 1 2 3 4 5 6 7 8 9 10

Appendix G: 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. Disinterested	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 H: Negative Self-Imagery Interview Script

Negative Self-Imagery Interview

Participant Number_____

We are going to think of a situation where you felt unhappy about your body or unhappy about a particular feature of your body.

Often when people are unhappy with their body they have an image of themselves or a sense of what they look like in their mind when they think about their body. I'm going to try and help you get hold of the image and the general sense of yourself you have when you are feeling unhappy with your body or a particular feature of your body.

Can you now take a couple of minutes to think of a particular situation where you felt unhappy about your body or unhappy about a particular feature of your body *(pause).*
Now you have identified a situation please close your eyes and re-create that situation and the image you have of yourself as vividly as possible whilst I ask you some questions about it…

Where are you?

What is happening?

What are you doing?

Who are you with?

What do you look like in the image?
- *Ensure the self-image is vivid*
- *Summarise*

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

How does that image make you feel about yourself?

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

Summarise the setting and image

Please keep holding that image of yourself in your mind whilst you answer the following questions.

1. **As you hold this image in mind, how unhappy were you on a scale of 0 to 100, where 0 is not at all unhappy and 100 is extremely unhappy with your body/that part of your body?**

Choose another situation if it is not above 60

2. **As you hold this image in mind, how vivid is this image on a scale of 0-100 (0 *not at all vivid*, 100 *extremely vivid*)?**

3. **How negative is this image on a scale of 0-100 (0 *not at all negative*, 100 *extremely negative*)?**

4. **What emotions do you feel now as you hold this image in mind? Rate that feeling from 0-100 (0 *not at all strong*, 100 *extremely strong*).**

- ***Do you feel any other emotions as you hold this image in mind? Rate each emotion***

5. **How do you feel about yourself in this moment now as you hold this image in mind?**

6. **How does it make you feel about yourself as a person now as you hold that image in mind (self-esteem)?**

Ok now I am going to re-cap what you have described to me and after I want you to let me know if I have captured your image correctly.

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

Appendix I: Positive Self-Imagery Interview Script

Positive self-Imagery Interview

Participant Number_____

We are going to think of a situation where you felt happy about your body or happy about a particular feature of your body.

Often when people are happy with their body they have an image of themselves or a sense of what they look like in their mind when they think about their body. I'm going to try and help you get hold of the image and the general sense of yourself you have when you are feeling happy with your body or a particular feature of your body.

Can you now take a couple of minutes to think of a particular situation where you felt happy about your body or happy about a particular feature of your body *(pause)***?**
Now you have identified a situation please close your eyes and re-create that situation and the image you have of yourself as vividly as possible whilst I ask you some questions about it…

Where are you?

What is happening?

What are you doing?

Who are you with?

What do you look like in the image?
- *Ensure the self-image is vivid*
- *Summarise*

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

How does that image make you feel about yourself?

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

Summarise the setting and image

Please keep holding that image of yourself in your mind whilst you answer the following questions.

7. **As you hold this image in mind, how happy were you on a scale of 0 to 100, where 0 is not at all happy and 100 is extremely happy with your body/that part of your body?**

Choose another situation if it is not above 60

8. **As you hold this image in mind, how vivid is this image on a scale of 0-100 (0 *not at all vivid*, 100 *extremely vivid*)?**

9. **How positive is this image on a scale of 0-100 (0 *not at all positive*, 100 *extremely positive*)?**

10. **What emotions do you feel now as you hold this image in mind? Rate that feeling from 0-100 (0 *not at all strong*, 100 *extremely strong*).**

- ***Do you feel any other emotions as you hold this image in mind? Rate each emotion***

11. **How do you feel about yourself in this moment now as you hold this image in mind?**

12. **How does it make you feel about yourself as a person now as you hold that image in mind (self-esteem)?**

Ok now I am going to re-cap what you have described to me and after I want you to let me know if I have captured your image correctly.

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

Appendix J: Participant Information Sheet

UNIVERSITY OF Southampton

Participant Information Sheet (Version 1)

Study Title: Effects of self-imagery on sense of self and how we feel about our bodies
Researcher: Stephanie Farrar (Trainee Clinical Psychologist)
Ethics number: 1225

Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?
This study aims to investigate how mental images of ourselves affect our sense of self (how we view ourselves) and how we feel about our bodies. This topic has not been widely researched and therefore it is hoped that the findings will help expand current psychological theory and inform future clinical interventions.

Why have I been chosen?
You have been chosen because you scored within the range we are interested in on the online questionnaires.

What will happen to me if I take part?
If you agree to take part in this study it will take approximately one hour of your time. Initially you will be asked to complete five paper based questionnaires. You will then complete an imagery based interview which will involve the researcher asking you some questions about the images you hold about yourself. This part of the study will be audio recorded to aid the researcher in quality control procedures. Finally, you will be asked to complete the same five questionnaires again, along with a computer based task. You will then be fully debriefed by the researcher and have an opportunity to ask any questions you may have.

Are there any benefits in my taking part?
There are no personal benefits to you in participating in this research; however, this study aims to further our understanding of the links between self-imagery and how people feel about themselves and their bodies. It is hoped that the findings will help inform the development of future clinical interventions.

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

Are there any risks involved?
We do not expect that participating in this study will cause you any harm. If you feel upset after talking about the images you hold of yourself, the researcher will guide you through an unrelated imagery script to help reduce any distress.

Will my participation be confidential?
This study complies with the Data Protection Act and therefore no participant identifying information will be used in the write-up and all the questionnaires you complete will be stored in a locked cabinet and will be anonymous.

What happens if I change my mind?
You can withdraw your data from the research study at any time if you change your mind and your legal rights will not be affected if you wish to do so. There will be no consequences for withdrawing your data, you do not need to give a reason, and you will still receive the credits/money earned.

What happens if something goes wrong?
If you have any concerns or wish to complain about this research study, please contact Sarah Boak or Martina Johnson on 023 80 598101 or s.l.boak@soton.ac.uk.

Where can I get more information?
If you have any further questions please contact Stephanie Farrar (Trainee Clinical Psychologist) at sf1g10@soton.ac.uk.

Thank you for taking the time to read this

Appendix K: Consent Form

CONSENT FORM (Version 1)

Study Title: Effects of self-imagery on sense of self and how we feel about our bodies
Researcher name: Stephanie Farrar (Trainee Clinical Psychologist)
Ethics reference: 1225

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

I have read and understood the information sheet (15/12/2011, Version 1) and have had the opportunity to 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 voluntary and I may withdraw at any time without 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……..

Name of Researcher (print name) ……

Signature of Researcher……..

Date……

Appendix L: Debrief Statement

Debriefing Statement (Version 1)

Effects of self-imagery on sense of self and how we feel about our bodies

Thank you for your participation in this research study

The aim of this study was to investigate the influence mental imagery has on sense of self (how we view ourselves) in individuals who report being dissatisfied with their bodies. More specifically we were interested in whether retrieving different self-images (positive or negative) effects how individuals view themselves and their level of body satisfaction.

Based on previous research we expect to find that individuals who retrieve a positive self-image report higher self-esteem, self-concept clarity (stability of your sense of self), body satisfaction and increased positive mood after the imagery intervention, compared to their pre-intervention scores. In comparison, we expect that individuals in the negative retrieval condition will report a decrease in their self-esteem, self-concept clarity, body satisfaction and positive mood. We expect this because previous research has demonstrated that accessing a positive image of oneself activates a positive working self (view of oneself/beliefs about self). It has also been demonstrated that the activation of this positive self decreases the accessibility of a negative working self (e.g. negative beliefs about the self).Your data will help to further inform our understanding of the role self-imagery has on sense of self in individuals who worry about their bodies. It will also help inform future treatment protocols for clinical populations. If you are interested in reading more about the previous research in this area, please see the references at the end.

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

Please Note: If you have worries about your weight or shape that are causing you distress, please contact your GP for support.

If you would like to see a copy of the study write-up this will be available from August 2013. Please contact Stephanie Farrar (Trainee Clinical Psychologist) if you would like a summary of the results or if you have any further questions about the research: sf1g10@soton.ac.uk.

Thank you again for your participation in this research study

Stephanie Farrar

If you have any questions regarding 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, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Tel. 02380 595578.

Further Reading:

Cooper, M. (2009). Imagery and the negative self in eating disorders. In Stopa, L. (2009). *Imagery and the threatened self: Perspectives on mental imagery and the self in cognitive therapy* (pp. 181 – 205). London: Routledge.

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

Appendix M: Ethical Approval Email

Submission Number: 1225
Submission Name: Effects of self-imagery on sense of self and how we feel about our bodies
This 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