

**INVESTIGATING EMOTIONS AND MOOD INDUCTION PROCEDURE
METHODOLOGY IN INDIVIDUALS WITH EATING DIFFICULTIES**

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Abstract

Investigating emotions and mood induction procedure methodology in individuals with eating difficulties.

A thesis submitted for the Degree of Doctor of Clinical Psychology (ClinPsyD)
Nicola Burke, University of Manchester, 10 July 2015

This thesis has been prepared in paper-based format and includes three papers consisting of 1) a literature review 2) an empirical study and 3) a personal and critical reflection on the research process.

The literature review in Paper One systematically investigated research utilising mood induction procedures (MIPs) in body image research. The paper aimed to evaluate 1) the methodological strengths and weaknesses of MIPs 2) report key study findings and 3) provide recommendations for future research using MIPs in body image research. Fifteen papers were reviewed and evaluated using a bespoke quality assessment tool. The majority of papers within the review included several limitations related to study design and MIP methodology. Key study findings suggested an effect of negative emotions (e.g., sadness) on body size estimation/body satisfaction. Due to identified methodological limitations, the validity of individual study findings and the literature area was questioned. Recommendations to improve the quality of future studies using MIPs in body image research are provided.

The empirical study in Paper Two aimed to investigate the theoretical concept of ‘emotion coupling’ between sadness and disgust in people with high eating concerns (HEC), and whether this may be linked to changes in body size estimation. A sadness mood induction procedure (MIP) was utilised to explore the proposed emotion coupling effect in those with HEC (n=26) and low eating concerns (LEC) (n=23), respectively. Results failed to find evidence of an emotion coupling effect between sadness and disgust in the HEC group, or differences in body size estimation, when compared to the LEC group. The HEC group displayed significantly different emotion regulation styles compared to the LEC group, indicating more unhelpful strategies in the former group. Methodological limitations and future research avenues are discussed.

Paper Three provides a personal and critical reflective account of the research process as a whole. It critically evaluates the strengths and limitations of the literature review and the empirical study. The paper discusses theoretical and methodological limitations and implications for both Papers One and Two. In addition, implications for clinical practice and future research avenues are considered. Paper 3 also provides personal reflections on decision-making processes and challenges encountered within the research.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Paper One

Methodological limitations of mood induction procedures in body image research: A systematic review

Prepared in accordance with author guidelines for submission to *Clinical Psychology
Review* (see Appendix 1)

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Abstract

Objectives: This paper aimed to critically evaluate literature using mood induction procedures (MIPs) in body image research. The review endeavoured 1) to identify the methodological strengths and weaknesses of MIPs in body image research 2) to report the key findings from studies using MIPs in body image research and 3) to provide recommendations for future research using MIPs in body image research. **Method:** Four databases were searched: PsychInfo, Embase, Web of Knowledge, ScienceDirect. Studies met the following inclusion criteria: 1) English language 2) empirical studies 3) published in peer reviewed journals 4) full-text papers 5) includes a MIP 6) includes a body image/body satisfaction outcome measure 7) includes healthy controls, analogue samples or people with eating disorders. Fifteen papers were identified. A bespoke tool evaluated the study quality and MIP methodology. **Results:** The majority of papers were of ‘moderate’ quality, and included several study design and MIP methodological limitations. Key study findings suggested an effect of negative emotions (e.g., sadness) on body size estimation/body satisfaction. **Discussion:** Due to identified methodological limitations, the validity of individual study findings was questioned. Recommendations to improve the validity and reliability of MIPs in body image research were provided.

Keywords:

Systematic review

Mood induction procedure

Body image

Methodological limitations

Highlights:

- The majority of studies were rated as ‘moderate’ on study design quality and mood induction procedure methodology.
- Key findings of individual studies suggested that ‘negative emotions’ have an effect on body size estimation and various aspects of body satisfaction.
- The validity and reliability of individual study results and the literature area as a whole may be compromised due to methodological limitations.

- Recommendations to improve the validity and reliability of mood induction procedures in body image research are provided.

INTRODUCTION

Emotion Regulation in Eating Disorders

Emotion regulation has become an important focus for research exploring the development and maintenance of eating disorders (EDs) (e.g., Hatch et al., 2010; Haynos & Fruzzetti, 2011). Emotion regulation refers to the “*processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions* (Gross, 1998, p. 275).” Across diagnostic categories, individuals with EDs have shown elevated rates of alexithymia (Bydlowski et al., 2005; Rastam, Gillberg, Gillberg & Johansson, 1997), which refers to the inability to identify and describe emotional states, and increased levels of emotion suppression (Forbush & Watson, 2006). Models of emotion regulation difficulties in EDs have emphasised how various ED behaviours may function to either suppress or block painful emotions (Brockmeyer et al., 2012; Fox & Power, 2009; Haynos & Fruzzetti, 2011). For example, Hatch et al. (2010) propose that food restriction in Anorexia Nervosa (AN) functions to regulate emotion, thinking and feeling. In addition, they discuss evidence of disturbances in early, non-conscious processing of emotional stimuli in AN for illness relevant stimuli (e.g., food, body images) and non-illness relevant stimuli (e.g., positive and negative faces) (Hatch et al., 2010). Haynos & Fruzzetti (2011) propose that restricting, exercising, or binge eating and purging in AN regulates emotion through “escape” behaviours from aversive emotional arousal, which negatively reinforces their use. Similarly, within Bulimia Nervosa (BN), Cooper, Wells & Todd (2004) have suggested that bingeing behaviours may provide short-term relief and distraction from negative thoughts and negative emotions.

Fox & Power’s (2009) Schematic, Propositional, Analogical and Associative Representation Systems in Eating Disorders (SPAARS-ED) model proposes that the EDs main function is to allow a person to avoid painful emotion (via restriction and/or bingeing/vomiting), however, ironically avoidance of negative emotion is not accomplished as it becomes directed onto the body as self-disgust (Fox, Grange & Power, 2014). Central to the SPAARS-ED model is the notion of ‘emotion coupling,’ in which two or more (basic) emotions can become coupled based on a persons learning history. This idea complements emotional inhibition, as ‘acceptable’ emotions are proposed to inhibit ‘unacceptable’ emotions (Fox, Federici, & Power,

2012). The aforementioned models have also made reference to an individual's early environment and the impact this may have upon emotion regulation difficulties in the development and maintenance of EDs (Cooper et al., 2004; Fox & Power, 2009; Hatch et al., 2010; Haynos & Fruzzetti, 2011).

Emotion conceptualisation

Using a basic emotions approach, which posits that a small number of emotions work as building blocks for more complex emotions (e.g., Ekman, 1982; Izard, 1971; Oatley & Johnson-Laird, 1987), Fox & Power's (2009) SPAARS-ED model specifies which emotions may be particularly problematic in EDs (e.g., anger, sadness, disgust). However, the aforesaid models have referred to emotion in more general terms, e.g., negative affect (Cooper et al., 2004; Hatch et al., 2010 Haynos & Fruzzetti, 2011). This highlights different approaches to emotion conceptualisation within research on EDs and emotion regulation, i.e., dimensional (e.g., positive and negative affect) versus basic emotions perspectives. Dimensional approaches refer to general affective dimensions of hedonic *valence* and *arousal* (Barrett & Bliss-Moreau, 2009), *positive* and *negative activation* (Watson & Tellegen, 1985) and *positive* and *negative affect* (Cacioppo, Garder, & Bernston, 1999). Basic emotions and dimensional perspectives are underpinned by the "natural kind" hypothesis and psychological constructionist accounts of emotions, respectively (Lindquist, Siegel, Quigley & Barrett, 2013). Basic emotions are assumed to be "natural kind" emotions, which are psychologically and biologically finite and separable mental events (Lench, Flores & Bench, 2011). Lindquist et al. (2013) discusses that dimensional theories include meaning-making processes, which are needed to make psychological sense of affective changes for discrete emotions to emerge, thus mapping onto psychological constructionist perspectives of emotion.

While there is on-going debate as to whether emotions can be viewed as being comprised of and built from a core group of basic emotions, within the basic emotions approach there is some agreement that anger, disgust, anxiety (fear), happiness and sadness should be included as basic emotions (Oatley & Johnson-Laird, 1987; Power & Dagleish, 1997).

Investigating Emotion Regulation difficulties in Eating Disorders

Experimental methods are important within emotion research, as emotion processes have been found to occur at an unconscious level within milliseconds of the triggering event (e.g., Hatch et al., 2010). Accordingly, in combination with ED illness-relevant stimuli, objective methodologies have used several techniques to investigate rapid, unconscious emotion processing in EDs. For example, methods such as: facial reactivity (Davies, Schmidt, Stahl & Tchanturia, 2011), facial recognition (Zonnevuelle-Bender, van Goozen, Cohen-Kettenis, van Elburg & van Engeland, 2002), dot-probe tasks (Rieger et al., 1998; Shafran, Lee, Cooper, Palmer & Fairburn, 2008) stroop tasks (Perpina, Leonard, Treasure, Bond & Banos, 1998), event-related potentials (ERPs; Hatch et al., 2010), functional magnetic resonance imaging (fMRI; Seeger, Braus, Ruf, Goldberger & Schmidt, 2002), heart rate (Gordon et al., 2001), skin conductance (Lattimore, Gowers & Wagner, 2000) and eye blink startle responses (Friederich et al., 2006).

These techniques have shown that individuals with EDs have differential response patterns to affective stimuli when compared with healthy controls. For example, Hatch et al. (2006, 2008) found evidence that Event-Related-Potentials (ERPs), a measure sensitive to the timing of brain function, was distinctly altered in individuals with AN in response to both negative and positive emotion stimuli (as cited in Hatch et al., 2010). These neural responses to positive and negative stimuli occurred within the first 200ms post-stimuli, suggesting these reactions were under automatic, non-conscious control (Hatch et al., 2010). Accordingly, objective measures of emotional processing provide increased validity and reliability of results. This is particularly pertinent as self-report mood measures are potentially confounded by deficits in emotion awareness (alexithymia) (Bydlowski et al., 2005) and high affective co-morbidity (Godart et al., 2007), which is often found in EDs. Underscoring the need for both objective and subjective measures within the research area, Zonnevuelle-Bender et al. (2005) found that AN patients displayed a discordance between self-reported emotional and neurophysiological arousal during psychological stress.

The above studies have provided useful information in terms of emotional responding to valenced stimuli in ED populations, however they have provided little in the way of how emotions may relate to or trigger cognitive and behavioural eating

disorder symptoms, for example, body image dissatisfaction (body size distortion, weight dissatisfaction, ‘feeling fat,’) and urges to restrict, binge/purge.

Body Image

Body image distortion is a well-known characteristic of EDs and is a defining feature of the disorder within the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association [APA], 2013). The diagnostic criteria for AN includes a disturbance in how one’s body weight or shape is experienced, and for both AN and BN, it refers to unwarranted influence of body weight or shape on self-evaluation (APA, 2013). Although the term “body image” is still not well defined (Skrzypek, Wehmeier & Remschmidt, 2001), it has been referred to by Slade (1994) as a “*loose mental representation of the body’s shape, form and size, which is influenced by a variety of historical, cultural and social, individual and biological factors* (p. 502).” Consistent with this definition, body image is widely accepted as comprising of two components, an individual’s perception of, and attitudes towards, his or her body and appearance (Cash, Fleming, Alindogan, Steadman & Whitehead, 2002; Skrzypek et al., 2001). Perception refers to the ability to accurately perceive body size. Individuals with EDs have been frequently found to overestimate body size, however this is not a universal characteristic of EDs (Cash & Deagle, 1997). Most authors agree that body size estimation is more than just a perceptual task and that body image disturbance in AN is not a perceptual disturbance *per se* (Skrzypek et al., 2001).

Attitudinal body image is often referred to as body dissatisfaction and is a multidimensional concept that encompasses cognitive/evaluative, affective and behavioural elements (see Cash & Deagle, 1997). Individuals with EDs may accurately estimate their size, but may be extremely dissatisfied with their size, shape or some other aspect of body appearance (Cash & Deagle, 1997).

Perceptual aspects of body image have been measured using the video distortion technique, whereby participants adjust the horizontal dimension of a TV image to match their perceived size (e.g., Freeman, Thomas, Solyom & Hunter, 1984). The body shape silhouettes method has also commonly been utilised, whereby participants have to select a shape that best represents themselves from a series of figures (e.g., Williamson, Gleaves, Watkins & Schlundt, 1993). Perceptual methods have been adapted to allow an attitudinal component, whereby participants are asked

to select or adjust an image to match their actual body size, as well as indicate their *ideal* body size. The discrepancy between self- and ideal-perception can then be quantified to give a measure of body dissatisfaction (Williamson, Gleaves, Watkins & Schlundt, 1993).

Attitudinal measures have assessed body dissatisfaction using self-report questionnaires or structured interviews, evaluating the body as a whole, or distinct body parts (Cash & Deagle, 1997). Attitudinal measures also commonly look at concerns about body weight, shape and the phenomenal experience of “feeling fat” (e.g., the Body Shape Questionnaire; BSQ; Cooper, Taylor, Cooper & Fairburn, 1987). Research tends to favour attitudinal over perceptual measures of body image, for example, Cash & Deagle’s (1997) meta-analysis demonstrated larger effect sizes for attitudinal measures and found it was superior in distinguishing between women with and without eating disorders.

Mood Induction Procedures

Experimental mood induction procedures (MIPs) afford one method of establishing causal relationships between an induced mood (e.g., sadness) and the effect on various ED symptoms, such as changes in body image measures (e.g., Kulbartz-Klatt, Florin & Pook, 1999; Plies & Florin, 1992). However, the validity of MIPs has been questioned in the general emotions literature (Martin, 1990; Westermann, Spies, Stahl & Hesse, 1996). MIPs are criticised for their potential demand characteristics, for example, often participants are instructed to enter into a specified mood (Buchwald, Strack & Coyne, 1981; Larsen & Sinnett, 1991). Others have refuted the influence of demand effects on MIPs (see Clark, 1983). It has also been argued that popular MIPs, such as the Velten technique (Velten, 1968), which involve participants reading a number of valenced self-statements (positive, negative or neutral, respectively), have low ecological validity (Fox et al., 2013). These are just two issues, which potentially threaten the validity and reliability of findings from these studies, and pose a threat to the wider field of research on emotion difficulties in EDs using these methods.

Review aims

In light of the above issues, this paper aims to systematically review the literature examining mood induction procedures in body image research. This review will

summarise and critique the extant literature and highlight theoretical implications and recommendations for future research. The specific questions addressed within this paper are:

1. What are the methodological strengths and weaknesses of mood induction procedures in body image research?
2. What are the key findings from the literature using mood induction procedures in body image research?
3. What recommendations can be made for future research using mood induction procedures in body image research?

Evaluation tool

In order to accomplish this first review question, a bespoke tool was developed to systematically evaluate studies within the review (see Table 1). The evaluation tool is based on factors listed in the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool For Quantitative Studies (1998) for example:

- Selection bias
- Study design
- Confounding variables
- Blinding procedures
- Data collection methods
- Withdrawals and drops-outs

These factors were deemed useful to judge the experimental design and quality of the review studies. Accordingly, within the ‘Study design’ section, studies were judged to be quasi-experimental if the sample groups displayed initial non-equivalence (e.g., those with high concern or low concern with body shape or weight). In addition, a control group, which typically receives no intervention, was deemed to be inappropriate if it consisted of a positive MIP, as it may increase the chance of finding a difference when compared with a negative MIP. Within the review, a neutral MIP was deemed to be preferable. Within ‘Confounding variables,’ studies were marked down if confounding variables such as depression and anxiety, which are frequently found in ED populations, were not controlled within the study analyses.

In addition, methodological issues common to MIPs were identified from the literature (e.g., Brenner, 2000; Martin, 1990; Westermann et al., 1996) and included in the bespoke tool, including:

- Validity of the mood induction procedure
- Specificity of mood induced
- Type of mood measurement
- Success rate of mood induction procedure
- Demand effects within the mood induction procedure

Validity refers to whether the MIP had been previously shown to induce a specified mood and whether it possessed ecological and face validity, all of which would increase the reliability, internal/external validity of the MIP, and therefore the study findings. Evaluating ecological and face validity is somewhat subjective, therefore, studies which used film, music, autobiographical recall were generally deemed to have good ecological and face validity. Gross & Levenson (1995) discussed that films have relatively high ecological validity as emotions are often elicited by dynamic visual and auditory stimuli that are external to the individual, the same logic was applied to music and images (Ellard, Farchione & Barlow, 2012); while autobiographical recall was deemed ecologically valid for its personal relevance. Studies that used Velten (1968) type self-statements were considered to have low ecological validity (Fox et al., 2013).

Studies were rated highly for using objective and subjective measures, as this increases the study validity, and if more than one or two emotions were measured, as this reduces demand effects, and evaluates whether other emotions were elicited. In addition, studies were rated highly if mood measures were administered immediately before and after the mood induction procedure, to ensure conclusions regarding mood and body image outcome variables could be valid and reliable.

Studies were also rated highly if a particular mood was targeted (e.g., sadness, anger), rather than a dimensional approach (e.g., negative affect). While taking a basic emotions approach may bias the results, it was envisioned that the review would highlight the different approaches to emotion conceptualisation within the literature and stimulate consideration of the issue.

Using this tool studies were given an overall rating, consisting of strong, moderate or weak quality. The review aimed to evaluate the methodological strengths of strong quality rated studies, and the methodological weaknesses of moderate and weak quality rated studies.

METHOD

Search Strategy

In December 2014, an electronic search was conducted on the following databases: PsychInfo (1801-2014), Embase (1980-2014), Web of Knowledge (all years) and ScienceDirect (Psychology, Advanced search, all years). Each database was searched individually. Within PsychInfo and Embase, a basic search was carried out using the following terms: mood induction body image, and included the related terms: mood(s), emotion(s), feeling(s), affective state, mode(s), mood function, induction(s), body image(s), image(s) body. Within Web of Knowledge and ScienceDirect, the same key search terms were used: mood induction body image. Limits included: English language and human studies.

Selection of Studies

All titles and/or abstracts were screened and compared against the inclusion criteria. Studies were required to be: (1) written in English; (2) empirical studies (3) published in peer reviewed journals; (4) full-text papers; (5) include a mood induction procedure; (6) include a measure of body image/body satisfaction as one of the outcome variables; (7) include healthy controls, analogue samples or people with eating disorders. No restrictions were placed on ethnicity or gender. Exclusion criteria consisted of (1) publications that comprised of an abstract only (2) non-human studies (3) studies that used an induction procedure, which did not use an identifiable emotion (e.g., body dissatisfaction induction), unless the study also included a valid mood induction procedure (e.g., sadness).

Description of Studies

The searches produced 8424 studies of interest. Following a process of screening titles and/or abstracts, reviewing the full-text of some articles and excluding irrelevant

studies, 15 papers met the inclusion criteria and were included in the review (see Figure 1 for the selection process).

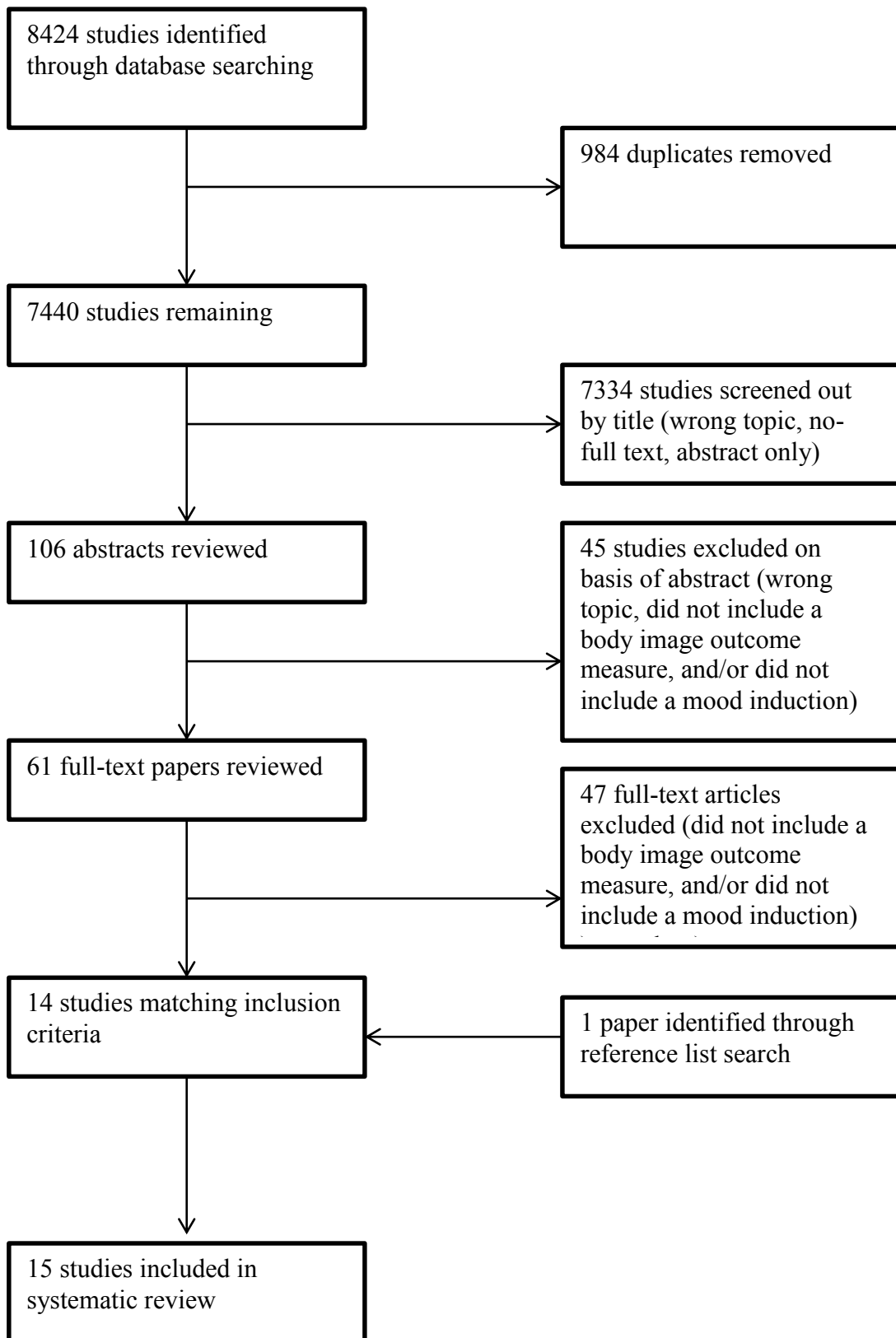


Figure 1. Flow chart of the process of study selection

Quality Assessment

The quality assessment of studies is considered an integral part of the review process to ensure the validity and reliability of the individual study results (Moher, Liberati, Tetzlaff, Altman; PRISMA Group, 2009). Due to the overlap between the quality assessment of the review studies, and the review's first aim (to determine the methodological strengths and weaknesses of mood induction procedures in body image research), the review chose to combine these two aspects into one single quality assessment tool. The quality assessment tool (see Table 1) was designed for the current review, against which each paper meeting the inclusion criteria was examined. As previously mentioned, the tool was based on the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool For Quantitative Studies (1998), and methodological issues common to mood induction procedures based on reviews by Brenner (2000), Martin (1990) and Westermann et al. (1996). All studies were assigned a score for each item (0-3), and these were summed to reach a total score. A total score of 0-16 indicated a strong quality rated paper, 17-34 indicated a moderate quality rated paper, and 35-52 indicated a weak quality rated paper. Of the 15 studies, 1 was of strong quality, and the remaining 14 were of moderate quality (see Table 2 for the quality assessment scoring tool results, and Table 3 for the study characteristics and main findings).

Table 1: Quality Assessment Tool

| Question | Score | | | |
|--|---|--|-----------------------------|------------|
| | 0 | 1 | 2 | 3 |
| A) SELECTION BIAS | | | | |
| Q1. Are the individuals selected to participate in the study likely to be representative of the target population? | Very likely | Somewhat likely | Not likely | Can't tell |
| Q2. What percentage of the initial sample agreed to participate? | 80-100% agreement | 60-79% agreement | Less than 60% agreement | Can't tell |
| B) STUDY DESIGN | | | | |
| Q1. Type of design | Experimental design (e.g., pre-test/post test control group, initial group equivalence) | Quasi-experimental design (e.g. initial group non-equivalence) | Can't tell | - |
| Q2. Is there a control group? | Yes and appropriately chosen | Yes but inappropriate | No | - |
| Q3. Was the study described as randomised? | Yes | No | - | - |
| C) CONFOUNDERS | | | | |
| Q1. Were there important differences between groups prior to the intervention? | No | Yes | Can't tell | - |
| Q2. If yes, indicate the percentage of relevant confounders that were controlled (either in the design or analysis). | 80-100% (most) | 60-79% (some) | Less than 60% (few or none) | Can't tell |
| D) BLINDING | | | | |
| Q1. Was (were) the outcome assessor(s) aware of the | No | Yes | Can't tell | - |

| | | | | |
|--|---------|----------|------------------|------------|
| intervention or exposure status of participants? | | | | |
| Q2. Were the study participants aware of the research question? | No | Yes | Can't tell | - |
| E) DATA COLLECTION METHODS | | | | |
| Q1. Were (all) body outcome measures shown to be valid? | Yes | No. | - | - |
| Q2. Were (all) body outcome measures shown to be reliable? | Yes | No. | - | - |
| F) WITHDRAWALS AND DROP-OUTS | | | | |
| Q1. Were withdrawals, drop-outs and/or exclusion(s) from data set reported in terms of numbers and/or reasons per group? | Yes | No | Can't tell | - |
| Q2. Indicate the percentage of participants completing the study from the initial sample. | 80-100% | 60-79% | Less than 60% | Can't tell |
| G) MOOD INDUCTION PROCEDURE (MIP) | | | | |
| Indicate type of MIP used | | | | |
| Q1. Was the MIP grounded in appropriate theory and/or research? | Yes | No | Can't tell | - |
| Q2. Had the MIP been previously validated? | Yes | Somewhat | No or can't tell | - |
| Q3. Does the MIP have face validity (does it appear to be a valid method)? | Yes | Somewhat | No | - |
| Q4. Does the MIP have ecological validity (real world applicability)? | Yes | Somewhat | No | - |
| Q5. Was the MIP described in | Yes | No | - | - |

| | | | | |
|---|--------------------------|-------------------------------------|---|---|
| sufficient detail to aide replication? | | | | |
| H) MOOD MEASURE | | | | |
| Indicate the mood measure(s) used. | | | | |
| Q1. What type of measure was used? | Objective and subjective | Subjective | - | - |
| Q2. Were psychometrics reported? | Yes | No | - | - |
| Q3. Was the measure administered pre- and post-MIP? | Yes | No | - | - |
| Q4. Were more than 1-2 moods measured? | Yes | No | - | - |
| Q5. Appropriate timing of measures? | Yes | No | - | - |
| I) SPECIFICITY OF MOOD | | | | |
| Indicate the target mood | | | | |
| Q1. Was a discrete emotion approach taken? | Yes | No | Diagnostic categories used (e.g., depression) | - |
| J) Intensity of mood | | | | |
| Q1. Were mean mood scores reported? | Yes | Pre-post difference scores reported | No | - |
| K) SUCCESS RATE | | | | |
| Q1. Was <i>a priori</i> criteria for a successful mood change reported? | Yes | No | - | - |
| Q2. Is there evidence participant mood scores were screened to ensure a change in mood had taken place? | Yes | No | - | - |
| Q3. Are the statistics appropriate for analysing mood change? | Yes | No | Can't tell | - |
| L) ADMINISTRATION TIME | | | | |
| Q1. Was the MIP administration time | Yes | No | - | - |

| | | | | |
|--|----|-----|------------|---|
| reported? | | | | |
| M) DEMAND EFFECTS | | | | |
| Q1. Were explicit instructions to “get into” a specified mood given? | No | Yes | Can’t tell | - |

Table 2: Quality Assessment Tool Results

| Quality Assessment Scores | | | | | | | | | | | | | | |
|---------------------------|----------------|--------------|-----------|----------|-----------------|-------------|----------------------------------|------------------------|----------------------------|-------------------|--------------|------------|----------------|---------------------------|
| Author (year) | Selection Bias | Study Design | Confounds | Blinding | Data collection | Withdrawals | Mood induction procedure | Mood measure | Specificity of mood | Intensity of mood | Success rate | Admin time | Demand effects | Total score /52 (quality) |
| 1. Wildes et al. (2012) | 3 | 0 | 0 | 2 | 0 | 2 | Film; 1 | PANAS ¹ ; 1 | Negative; neutral; 1 | 0 | 2 | 0 | 0 | 12 (Strong) |
| 2. Taylor & Cooper (1992) | 1 | 1 | 0 | 2 | 2 | 0 | Self-statements ² ; 3 | VAS ³ ; 3 | Low mood, positive mood; 1 | 2 | 1 | 1 | 1 | 18 (Moderate) |
| 3. Smith & Rieger (2010) | 1 | 0 | 0 | 4 | 2 | 0 | Imagery; 4 | VAS; 2 | Negative; 1 | 1 | 2 | 1 | 0 | 18 (Moderate) |

¹ Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988), as cited in Wildes et al. (2012)

² Participants read a list of self-referent statements that are of positive, negative or neutral affective material, respectively.

³ Visual Analogue Scale

| | | | | | | | | | | | | | | |
|---------------------------------|---|---|---|---|---|---|---------------------------------------|--|--|---|---|---|---|---------------|
| 4. Fox et al. (2013) | 3 | 3 | 1 | 2 | 2 | 2 | Autobio memory ⁴ + film; 1 | STAXI ⁵ , DS-R ⁶ ; 2 | Anger; 0 | 0 | 1 | 0 | 1 | 18 (Moderate) |
| 5. Haedt-Matt et al. (2012) | 4 | 0 | 0 | 2 | 1 | 3 | Music, self-statements; 4 | VAS 3 | Sad; 0 | 2 | 2 | 0 | 1 | 22 (Moderate) |
| 6. Coelho et al. (2008) | 4 | 1 | 2 | 2 | 2 | 3 | Imagery, self-statement; 4 | PANAS ; 1 | Anxiety; 2 | 0 | 2 | 1 | 0 | 24 (Moderate) |
| 7. Harney & Bardone-Cone (2014) | 4 | 1 | 2 | 4 | 2 | 3 | Still images; 1 | PANAS ; 3 | Negative; neutral; (body dissatisfaction); 1 | 0 | 2 | 0 | 0 | 23 (Moderate) |
| 8. Baker et al. (1995) | 4 | 1 | 2 | 4 | 0 | 2 | Self-statements; 3 | SUDS ⁷ ; DACL ⁸ 3 | Negative; neutral; 1 | 0 | 2 | 0 | 2 | 24 (Moderate) |

⁴ Autobiographical memory recall.

⁵ State-Trait Anger Expression Inventory-2 (Spielberger, 1996), as cited in Fox et al. (2013)

⁶ Disgust Scale-Revised (DS-R; Olatunji et al., 2007), as cited in Coelho et al. (2008).

⁷ Subjective Units of Distress Scale (SUDS), an adaptation of Wolpe & Lazarus (1967), as cited in Baker et al. (1995).

⁸ Depressive Adjective Checklist (DACL; Lubin, 1967), as cited in Baker et al. (1995)

| | | | | | | | | | | | | | | |
|----------------------------------|---|---|---|---|---|---|--------------------------------|------------|------------------------------|---|---|---|---|---------------|
| 9. Plies & Florin (1992) | 3 | 3 | 2 | 4 | 1 | 2 | Autobio memory; 2 | VAS; 3 | Sad, Positive (joyful); 0 | 0 | 2 | 1 | 1 | 24 (Moderate) |
| 10. Mayer et al. (2008) | 4 | 1 | 0 | 4 | 1 | 3 | Smell; 4 | VAS; 4 | Disgust; 0 | 0 | 2 | 1 | 0 | 24 (Moderate) |
| 11. Barber (2001) | 4 | 1 | 1 | 2 | 2 | 3 | Self-statements; 4 | VAS; 3 | Low/sad/depressed; 1 | 0 | 2 | 0 | 1 | 24 (Moderate) |
| 12. Rotenberg et al. (2004) | 4 | 1 | 0 | 4 | 2 | 2 | Self-statements, Imagery; 4 | DACL; 2 | Positive; negative; 1 | 0 | 2 | 0 | 1 | 23 Moderate |
| 13. Kulbarts-Klatt et al. (1999) | 4 | 3 | 1 | 4 | 1 | 3 | Autobio memory + music; 1 | VAS; 3 | Happy; Sad; 0 | 2 | 2 | 0 | 1 | 25 (Moderate) |

| | | | | | | | | | | | | | | |
|--------------------------|---|---|---|---|---|---|----------------------------|--------------------|----------------------------------|---|---|---|---|------------------|
| 14. Carter et al. (1996) | 4 | 1 | 1 | 2 | 2 | 5 | Music; 3 | VAS; SUDS; 3 | Low/sad/depressed; neutral; 1 | 2 | 1 | 0 | 1 | 26 (Moderate) |
| 15. Cohen-Tovée (1993) | 3 | 3 | 1 | 4 | 2 | 2 | Music+ statements; 4 | VAS; 3 | Depressed; 2 | 1 | 1 | 1 | 2 | 29 (Moderate) |

Table 3: Summary table of study characteristics and main findings.

| Study | Population | Sample Size | Sample Characteristics Mean age (SD) | Method | Body image measure | Study Findings | Quality Rating |
|---------------------------|-------------------|--|--|-----------------------------------|--|--|----------------|
| 1. Wildes et al. (2012) | AN ⁹ | AN Negative (Neg.) MIP ¹⁰ =13; AN Neutral MIP=15 | Total sample= 32.36 (11.39) | AN Neg. MIP vs. AN Neutral MIP | EDS ¹¹ | AN Neg.= significant increase in maladaptive thoughts of eating, weight & shape vs. AN neutral. | Strong |
| 2. Taylor & Cooper (1992) | HCG ¹² | Low MIP=37; Positive (Pos.) MIP=36 | Low MIP=19.9(0.2); Pos. MIP=20.0(0.2) | Low MIP vs. Pos. MIP | BSQ ¹³ ; DVIT ¹⁴ | Low MIP= significant increase body size dissatisfaction and smaller desired size; trend towards increased body size estimation vs. Pos. MIP. | Moderate |

⁹ Anorexia Nervosa (AN) according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria (APA, 1994), as cited in Wildes et al. (2012).

¹⁰ Mood Induction Procedure (MIP)

¹¹ Eating Disordered Symptoms (EDS), an experimenter-designed questionnaire looking at maladaptive thoughts concerning eating, weight and shape.

¹² Healthy Control Group

¹³ Body Shape Questionnaire (BSQ; Cooper, Taylor & Fairburn, 1987), as cited in Taylor & Cooper (1992).

¹⁴ Distorting video images technique (DVIT) based on Freeman, Thomas, Solyom & Hunter (1984), as cited in Taylor & Cooper (1992).

| | | | | | | | |
|-----------------------------|-----------------------|--|--|---------------------------------------|---|--|----------|
| 3. Smith & Rieger (2010) | HCG | BDI ¹⁵ =18; Neg. MIP=18; Neutral MIP=18 | BDI=19.61(1.68); Neg. MIP=19.55(1.54); Neutral MIP=19.86(1.61) | BDI vs. Neg. MIP; BDI vs. Neutral MIP | BSQ; PASTAS ¹⁶ ; Dot probe task ¹⁷ | Neg. MIP=no difference in body dissatisfaction vs. BDI. | Moderate |
| 4. Fox et al. (2013) | AN ⁹ ; HCG | AN=22; HCG=19 | AN=23.70(4.20); HCG=23.38(3.03) | AN Anger MIP vs. HCG Anger MIP | BSS ¹⁸ | Anger MIP=significant increase in anger. AN Anger MIP=significant increase in disgust, body size estimation vs. HCG. | Moderate |
| 5. Haedt-Matt et al. (2012) | HCG | HCG Sad. MIP=21; HCG Neutral MIP=24 | HCG Sad. MIP=19.56(1.21); HCG Neutral MIP=20.44(2.12) | HCG Sad. MIP vs. HCG Neutral MIP | VAS ¹⁹ | HCG Sad. MIP=significant increase body weight/ shape dissatisfaction vs. HCG neutral MIP. | Moderate |

¹⁵ Body Dissatisfaction Induction (BDI)

¹⁶ Physical Appearance State and Trait Anxiety Scale (PASTAS; Reed, Thompson, Brannick & Sacco, 1991), as cited in Smith & Rieger (2010).

¹⁷ Dot probe task based on Dehghani, Sharpe & Nicolas (2004), as cited in Smith & Rieger (2010).

¹⁸ Body Shape Silhouettes (BSS)

¹⁹ Visual Analogue Scales (VAS) measuring body shape satisfaction and weight satisfaction.

| | | | | | | | |
|---------------------------------|--|--|---|---|--|--|----------|
| 6. Coelho et al. (2008) | Clinical sample (AN ⁱ , BN ²⁰ , EDNOS ²¹); Analogue sample (REs ²²); HCG (UREs ²³) | Clinical =35 (AN=23, BN=7, EDNOS=4); REs=38; UREs=39 | Clinical=29.10(1.15); REs=18.83(1.17); UREs=18.38(1.13) | Anxiety MIP vs. BDI vs. Control MIP | VAS ²⁴ | BDI= significant increase in feeling “fatter” vs. anxiety, control (Clinical >REs, UREs). Anxiety (REs)=significant increase in likelihood of weight gain vs. control (REs). | Moderate |
| 7. Harney & Bardone-Cone (2014) | Analogue (HBS ²⁵); HCG (LBS ²⁶) | BDI: (LBS=22, HBS=26); Neg. MIP (LBS=23, HBS=25); | LBS=18.83(1.11); HBS=18.96(1.07) | HBS (BDI vs. Neg. MIP vs. Neutral MIP) vs. LBS (BDI vs. Neg. MIP vs. Neutral MIP) | EDE-Q ²⁷ ; VAS ¹⁹ ; WCST ²⁸ | Post MIP body outcome measures were not compared between groups. | Moderate |

²⁰ Bulimia Nervosa (BN) according to DSM-IV criteria (APA, 1994), as cited in Coelho et al. (2008).

²¹ Eating Disorder Not Otherwise Specified (EDNOS) according to DSM-IV criteria (APA, 1994), as cited in Coelho et al. (2008).

²² Restrained Eaters (REs), based on Restraint Scale (Polivy, Herman & Howard, 1998), score of ≥ 14 , as cited in Coelho et al. (2008).

²³ Unrestrained Eaters (UREs), based on Restraint Scale (Polivy, Herman & Howard, 1998), score of ≤ 14 , as cited in Coelho et al. (2008).

²⁴ Thought Shape Fusion “state” questionnaire: rated two questions related to likelihood of weight-gain and feelings of “fatness.”

²⁵ High Body Shame (HBS) established using the Body Shame subscale of the Objectified Body Consciousness Scale (OBCS-BS; McKinley & Hyde, 1996), as cited in Harney et al. (2014).

²⁶ Low Body Shame (LBS) established using the OBCS-BS (McKinley & Hyde, 1996), as cited in Harney et al. (2014).

²⁷ Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994), two items measuring dissatisfaction with weight and shape, as cited in Harney et al. (2014).

²⁸ Wisconsin Card Sorting Task (WCST; Heaton, Chelune, Talley, Kay & Curtiss, 1993), as cited in Harney et al. (2014).

| | | | | | | | |
|--------------------------|--|--------------------------------------|-----------------------------------|--|---|--|----------|
| | | Neutral MIP: (LBS =18, HBS=30) | | | | | |
| 8. Baker et al. (1995) | Analogue (HBD ²⁹); HCG: (LBD ³⁰) | HBD=36; LBD=36 | HBD=19.0(1.74); LBD=19.2(2.05) | Neg. MIP (HBD; LBD) vs. Neutral MIP (HBD; LBD) | BSQ; BIA (CBS, IBS) ³¹ ; EDI ³² | Neg. MIP (HBD)=significantly increased CBS, BSQ vs. Neutral (HBD). Neg. MIP (LBD)= no difference vs. Neutral MIP (LBD). | Moderate |
| 9. Plies & Florin (1992) | Analogue (REs ³³); HCG (UREs ³⁴) | REs=20; UREs=20 | REs=22.6(3.3); UREs=22.7(2.8) | REs (Baseline vs. Sad MIP vs. Pos. MIP) vs. UREs (Baseline vs. Sad MIP vs. Pos. MIP) | DVIT ¹⁴ | Sad MIP=significantly higher body width estimations vs. baseline, positive MIP. Sad MIP (REs)= significantly larger difference in sensed and actual body width vs. Sad MIP | Moderate |

²⁹ High Body Dysphoria (HBD) established using the BSQ (Cooper et al., 1987), as cited in Baker et al. (1995).

³⁰ Low Body Dysphoria (LBD) established using the BSQ (Cooper et al., 1987), as cited in Baker et al. (1995).

³¹ Body Image Assessment (BAI) utilised body silhouettes to measure Current Body Size (CBS), Ideal Body Size (IBS)(Williamson, Davis, Bennett, Goreczny & Gleaves, 1989), as cited in Baker et al. (1995).

³² Eating Disorder Inventory (EDI; Garner, Olmstead & Polivy, 1983), as cited in Baker et al. (1995).

³³ Restrained Eaters (REs) established using German version of the Three Factor Eating Questionnaire (FEQ) (Stunkard & Messick, 1985; Pudel & Westenhoefer, 1989), score >11 on Factor 1, as cited in Plies & Florin (1992).

³⁴ Unrestrained Eaters (UREs) established using German version of FEQ (Stunkard et al., 1985; Pudel et al., 1989), score <5 on Factor 1, as cited in Plies & Florin (1992).

| | | | | | | | |
|-----------------------------|-------------------|---|-------------------------------------|--|---|---|----------|
| | | | | | | (UREs). | |
| 10. Mayer et al. (2008) | HCG | Disgust MIP=25; Control MIP=25 | Not reported | Disgust MIP vs. Control MIP | BES, DEBQ, BIBCQ ³⁵ | Disgust MIP= significantly higher levels of disgust vs. controls. No difference on body outcome measures. | Moderate |
| 11. Barber (2001) | HCG: Male, Female | N=83 (3 groups: Low MIP, Neutral MIP, Elated MIP) | Total sample=19.30 (1.12) | Low MIP vs. Elated MIP vs. Neutral MIP (by gender) | BSS | Low MIP= overweight people felt heavier, underweight people felt lighter. | Moderate |
| 12. Rotenberg et al. (2004) | HCG | N=80 | Total sample=21.7 (age range 18-51) | Pos./Neg. self-referent MIP vs. Pos./Neg. other-referent MIP | BSQ, WSD, BIQ, CSAW, BIAS ³⁶ | Neg. self-referent MIP= increased negative body image vs. Pos. self-referent | Moderate |

³⁵ Items were taken from the: Body Esteem Scale (BES; Franzoi & Shields, 1984), Dutch Eating Behaviour Questionnaire (DEBQ; Van Strien, Frijters, Bergers & Defares, 1986), Body Image and Body Change Questionnaire (BIBCQ; Ricciardelli & McCabe, 2002), as cited in Mayer et al. (2008).

³⁶ Body Shape Questionnaire-short-form (BSQ; Cooper, Taylor, Cooper & Fairburn, 1987), Weight/Size Dissatisfaction rating scale (WSD; Garner, Olmstead & Polivy, 1983), Body Image Ideals Questionnaire (discrepancy and importance subscales) (BIQ; Cash & Szymanski, 1995), Concerns for Shape and Weight scale (attitude and affect subscales) (CSW; Davis & Philips, 1996), Body Image Assessment Scale (BIAS; Gardner, Friedman & Jackson, 1998), all measures were reduced to one composite score for pre- and post- time-points, respectively, as cited in Rotenberg et al. (2004).

| | | | | | | | |
|----------------------------------|--|---------------------|--|---|---------------------------|--|----------|
| | | | | | | MIP. This pattern increased with higher initial negative body image. | |
| 13. Kulbartz-Klatt et al. (1999) | Clinical (BN ³⁷ , PD ³⁸); HCG | BN=40; PD=20; CG=40 | BN=27.5(5.7); PD=30.1(5.0); CG=27(5.1) | BN (Happy MIP vs. Sad MIP), PD (Happy vs. Sad), CG (Happy vs. Sad) | DVIT ¹⁴ | Sad MIP (BN)=significant increase in body width estimates. No change in PA or CG groups. | Moderate |
| 14. Carter et al. (1996) | BN ³⁹ ; HCG | BN=7; HCG=8 | Age range: 18-40 (means not reported) | BN (Neutral MIP, Sad MIP, Food, Combined ⁴⁰) vs. HCG (Neutral, Sad, Food, Combined) | Silhouettes ⁴¹ | Sad MIP and food cues (BN)= rated current body as being larger vs. all groups/conditions | Moderate |
| 15. Cohen-Tovée (1993) | Analogue: HC ⁴² , LC ⁴³ | HC=17; LC=16 | Not reported | HC Depressed MIP vs. LC Depressed MIP | BSQ | Depressed MIP (HC)=significant increase in body concerns vs. LC | Moderate |

³⁷ Bulimia Nervosa (BN) based on Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition-Revised (DSM-III-R) criteria (Margraf, Schneider & Ehlers, 1991), as cited in Kulbartz-Klatt et al. (1999).

³⁸ Panic Disorder (PD) based on Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition-Revised (DSM-III-R) criteria (Margraf, Schneider & Ehlers, 1991), as cited in Kulbartz-Klatt et al. (1999).

³⁹ Bulimia Nervosa (BN) based on the eating disorders section of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon & First, 1990), as cited in Carter et al. (1996).

⁴⁰ Each participant took part in four conditions, respectively, a Neutral MIP, Sad MIP, food condition, and combined Sad MIP/food condition.

⁴¹ Computerised Silhouettes (Williamson et al., 1989), as cited in Carter et al. (1996).

⁴² High Concern (HC) with shape or weight, established using the Eating Disorder Examination (EDE; Cooper & Fairburn, 1986), score of >4 on one or both sections, as cited in Cohen-Tovée (1993).

⁴³ Low Concern (LC) with Shape or weight, established using EDE (Cooper & Fairburn, 1986) score of 0 or 1 on both sections, as cited in Cohen-Tovée (1993).

RESULTS

Strong quality assessment rating

Strengths of study design

One study met criteria for a strong quality assessment rating (Wildes, Marcus, Bright & Dapelo, 2012), indicating that the study's method was satisfactory and the findings possess good reliability and validity. Features of this study included using a pre-test/post-test control group experimental design, in which the initial samples were similar (e.g., participants had a diagnosis of Anorexia Nervosa) and assignment to the mood induction procedure (MIP) was randomised. The study included an appropriate control condition, e.g., a neutral MIP. Another feature consisted of reporting on participant withdrawals or exclusions from the data set. The study used participants who were "somewhat likely" to be representative of the population, and reported data on the number of participants who were approached and agreed to participate in the study.

Strengths of MIP method

The study's MIP possessed ecological and face validity; procedures were also described in enough detail to allow replication. The study used mood measures that sampled more than one or two emotions, and the MIP was administered without instructions to 'get into' a specified mood, both of which may reduce demand effects.

Weaknesses of study design

The weakest element of the strong quality rated study was the lack of reporting on blinding procedures and the low percentage of participants who completed the study compared to the initial sample.

Weaknesses of MIP method

The exact materials for the neutral MIP had not been previously validated. With regards to mood measures, the study only used subjective measures of mood; in addition, a dimensional approach to mood induction was used (i.e., negative affect). Lastly, there was no *a priori* criterion for a 'successful' mood change, and no evidence that participant's mood scores were screened to ensure a change in mood had taken place before undergoing group comparison.

Moderate quality assessment rating

Weaknesses of study design

The remaining fourteen studies received a moderate quality assessment rating, indicating that the individual study findings should be treated with caution. While these studies varied in terms of their strengths and weaknesses, there were some commonalities. In terms of selection biases, nine studies did not report on what percentage of the initial sample agreed to participate in the study (Baker, Williamson & Sylve, 1995; Barber, 2001; Carter, Bulik, Lawson, Sullivan & Wilson, 1996; Coelho, Carter, McFarlane & Polivy, 2008; Haedt-Matt, Zalta, Forbush & Keel, 2012; Harney & Bardone-Cone, 2014; Kulbartz-Klatt, Florin & Pook, 1999; Mayer, Bos, Muris, Huijding & Vlieland, 2008; Rotenberg, Taylor & Davis, 2004), while three studies had less than 60% agreement rate (Cohen-Tovée, 1993; Fox et al., 2013; Plies & Florin, 1992). With regards to study design, nine studies used a quasi-experimental design in which the initial sample groups were not equivalent (e.g., participants had high concern and low concern with shape and weight, respectively) (Baker et al., 1995; Barber, 2001; Carter et al., 1996; Coelho et al., 2008; Cohen-Tovée, 1993; Fox et al., 2013; Harney et al., 2014; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992). Six studies used control groups that were inappropriate (e.g., positive MIP) (Cohen-Tovée, 1993; Fox et al., 2013; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992; Rotenberg et al., 2004; Taylor & Cooper, 1992), and five studies did not use group randomisation procedures (Cohen-Tovée, 1993; Fox et al., 2013; Kulbartz-Klatt et al., 1999; Mayer et al., 2008; Plies & Florin, 1992). Nine studies were found to have important confounding variables (Baker et al., 1995; Barber, 2001; Carter et al., 1996; Coelho et al., 2008; Cohen-Tovée, 1993; Fox et al., 2013; Harney et al., 2014; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992), four of these studies did not appear to adequately control for at least some of these variables (Baker et al., 1995; Coelho et al., 2008; Harney et al., 2014; Plies & Florin, 1992). All fourteen studies did not report on blinding procedures; while eight studies did not describe what information was given to participants regarding the research question (Baker et al., 1995; Cohen-Tovée, 1993; Harney et al., 2014; Kulbartz-Klatt et al., 1999; Mayer et al., 2008; Plies & Florin, 1992; Rotenberg et al., 2004; Smith & Rieger, 2010). Regarding data collection methods for the body outcome measures, nine studies did not use (or report on) the validity and reliability of the measures (Barber, 2001; Carter et al., 1996;

Cohen-Tovée, 1993; Coelho et al., 2008; Fox et al., 2013; Harney et al., 2014; Rotenberg et al., 2004; Smith & Rieger, 2010; Taylor & Cooper, 1992). In terms of the percentage of participants completing the study from the initial sample, five studies had less than 60% completion rate (Baker et al., 1995; Cohen-Tovée, 1993; Fox et al., 2013; Plies & Florin, 1992; Rotenberg et al., 2004), while seven studies did not provide enough information to evaluate this issue (Barber, 2001; Carter et al., 1996; Coelho et al., 2008; Haedt-Matt et al., 2012; Harney et al., 2014; Kulbartz-Klatt et al., 1999; Mayer et al., 2008).

Weaknesses of MIP method

Eleven studies did not report using MIP methods that had been previously validated (i.e., shown to induce a specified mood) (Baker et al., 1995; Barber, 2001; Carter et al., 1996; Cohen-Tovée, 1993; Coelho et al., 2008; Haedt-Matt et al., 2012; Mayer et al., 2008; Plies & Florin, 1992; Rotenberg et al., 2004; Smith & Rieger, 2010; Taylor & Cooper, 1992), while eight studies used MIPs that were judged to have low ecological validity (Baker et al., 1995; Barber, 2001; Cohen-Tovée, 1993; Coelho et al., 2008; Haedt-Matt et al., 2012; Rotenberg et al., 2004; Smith & Rieger, 2010; Taylor & Cooper, 1992). In addition, eight studies did not provide sufficient study information to enable replication (Barber, 2001; Carter et al., 1996; Cohen-Tovée, 1993; Coelho et al., 2008; Haedt-Matt et al., 2012; Harney et al., 2014; Rotenberg et al., 2004; Smith & Rieger, 2010); six studies did not state the length of time taken to administer the MIP (Cohen-Tovée, 1993; Coelho et al., 2008; Mayer et al., 2008; Plies & Florin, 1992; Smith & Rieger, 2010; Taylor & Cooper, 1992).

Regarding measurement of mood, all fourteen studies used subjective instruments, and nine studies did not report any psychometrics for these tools (Barber, 2001; Carter et al., 1996; Cohen-Tovée, 1993; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Mayer et al., 2008; Plies & Florin, 1992; Smith & Rieger, 2010; Taylor & Cooper, 1992). Ten studies did not measure more than one or two emotions (Baker et al., 1995; Carter et al., 1996; Cohen-Tovée, 1993; Fox et al., 2013; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Mayer et al., 2008; Plies & Florin, 1992; Rotenberg et al., 2004; Taylor & Cooper, 1992), and three studies did not administer mood measures at appropriate time points (e.g., immediately after the MIP) (Baker et al., 1995; Carter et al., 1996; Harney et al., 2014;). Four studies did not report any mean

scores for the mood measurements (Carter et al., 1996; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Taylor & Cooper, 1992), while two studies only reported mood change scores (Cohen-Tovée, 1993; Smith & Rieger, 2010).

In terms of the specificity of mood, four studies took a dimensional approach to mood (e.g., negative, positive) (Baker et al., 1995; Harney et al., 2014; Rotenberg et al., 2004; Smith & Rieger, 2010), three studies discussed inducing a low (Taylor & Cooper, 1992) or low/sad/depressed mood (Barber, 2001; Carter et al., 1996), while two studies used diagnostic labels (e.g., depression, anxiety) (Cohen-Tovée, 1993; Coelho et al., 2008).

None of the fourteen studies established *a priori* criteria for evaluating the success rate of inducing a specified mood (e.g., a one-point change in the intended direction using a Visual Analogue Scale). In addition, ten studies did not report whether participant mood measures were individually screened in order to ensure a change in mood had taken place before group comparison (Baker et al., 1995; Barber, 2001; Coelho et al., 2008; Haedt-Matt et al., 2012; Harney et al., 2014; Kulbartz-Klatt et al., 1999; Mayer et al., 2008; Plies & Florin, 1992; Rotenberg et al., 2004; Smith & Rieger, 2010).

With regards to demand effects, nine studies gave explicit instructions for participants to enter into a specified mood state (Baker et al., 1995; Barber, 2001; Carter et al., 1996; Fox et al., 2013; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992; Rotenberg et al., 2004; Taylor & Cooper, 1992), while a further study did not provide enough information to evaluate this issue (Cohen-Tovée, 1993).

Body Image Findings

Body Image in Eating Disorder populations

The second aim of the review was to discuss the findings emerging from studies using MIPs to investigate body image (see Table 3). Five out of the fifteen papers utilised Eating Disorder samples, including participants with a diagnosis of Anorexia Nervosa (AN) according to Diagnostic and Statistical Manual, 4th Edition (DSM-IV; APA,

1994) criteria (Coelho et al., 2008; Fox et al., 2013; Wildes et al., 2012), Bulimia Nervosa (BN) (Coelho et al., 2008), Eating Disorder Not Otherwise Specified (EDNOS) (Coelho et al., 2008), or BN based on DSM-III-R criteria (Margraf, Schneider & Ehlers, 1991; Kulbartz-Klatt et al., 1999), and the eating disorders section of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, Gibbon & First, 1990) (Carter et al., 1996).

In the strong quality rated paper, within a sample of participants with AN receiving specialist inpatient treatment, those who received a negative MIP demonstrated a significant increase in maladaptive thoughts related to eating, shape, and weight (e.g., 'I feel fat,' 'I want to restrict') compared to AN inpatients who received a neutral MIP (Wildes et al., 2012). The authors noted some limitations to their study, including a small sample size, a low rate of study enrolment (indicating selection bias), and results that may not generalise to community-dwelling groups. In addition, a dimensional approach to emotion limits exploration of which negative emotions may be important in eating disorders.

In a study of moderate quality with an inpatient AN sample and a healthy control group, an anger MIP led to a significant increase in anger in both groups, while disgust levels and body size estimation (measured using body shape silhouettes) increased significantly in the AN, but not the healthy control group (Fox et al., 2013). The study was limited by a small sample size, the use of body outcome measures that were not validated, and an attrition rate that may have inadvertently caused selection bias. In addition, possible demand characteristics were present in the MIP instructions, and only two emotions were sampled post-MIP.

Two further studies of moderate quality using participants with Bulimia Nervosa (BN) found that a sadness MIP led to a significant increase in body size estimation (measured using a distorting video images technique) while healthy controls and participants with panic disorder did not show this effect (Kulbartz-Klatt et al., 1999); in a repeated measures design, a combination of food and sad/low mood cues led to increased current body size estimation (measured using a computerised body shape silhouette method) compared to when BN participants received a neutral MIP (Carter et al., 1996). Contrary to expected findings, BN participants level of body

dissatisfaction (current body size estimation minus ideal body size) did not change significantly following sad mood and/or food cues (Carter et al., 1996). Limitations of these studies included a lack of a neutral MIP control group (Kulbartz-Klatt et al., 1999) and a small sample size (Carter et al., 1996). In addition, the MIPs were not fully validated, demand characteristics were present in the MIP instructions, and only one or two emotions were sampled post-MIP, which reduces confidence that the MIPs produced a genuine mood.

Body Image in Analogue samples

Four studies of moderate quality utilised analogue and healthy control samples to investigate body image (Baker et al., 1995; Cohen-Tovée, 1993; Harney et al., 2014; Plies & Florin, 1992). All four studies used different measures to classify their sample (e.g., Eating Disorder Examination Questionnaire, Body Shape Questionnaire), typically dividing participants into those with high or low shape and weight concerns, respectively. Similar to Wildes et al. (2012), Baker et al. (1995) found that a negative MIP significantly increased body shape concerns and current body size estimation in those with high body dysphoria (HBD), compared to those with HBD in a neutral MIP; whereas those with low body dysphoria (LBD) in the negative MIP did not differ from those in the neutral MIP. Limitations of this study included the presence of confounding variables that were not controlled for in the analysis (e.g., depression scores), pre-MIP body measures were given at a prior testing session, the MIP had low ecological validity (e.g., self-statements), a dimensional approach to emotions was used, and a small range of emotions was sampled, which may have posed demand characteristics. Similar to Baker et al. (1995) and Wildes et al. (2012), Cohen-Tovée (1993) found that a depressed MIP increased body weight and shape concerns in those with high body concern compared to a group with low body concerns. This study was limited by a lack of a suitable control condition, a low study participation rate and no description of measurement psychometric properties. In addition, little information about the MIP was given, including the materials used.

In slight contrast to Baker et al. (1995), Plies & Florin (1992) found that a sad MIP increased body width estimation in restrained *and* unrestrained eaters, using a distorting video images technique, when compared to baseline scores and a positive

MIP, respectively. This evidence suggests that sad mood can effect body perception in women with low body concerns, which was not demonstrated in Baker et al. (1995). However, despite this, following the sad MIP a greater difference between sensed and actual body width was found in restrained eaters compared to unrestrained eaters (Plies & Florin, 1992). Study limitations include no neutral control condition, the possible presence of important confounding variables that were not controlled for (e.g., depression), the use of an MIP that had not been described as validated. In addition, possible demand characteristics were present in the MIP instructions and only two emotions were sampled post-MIP, which again reduces confidence that the MIP produced a genuine mood.

Body Image in Healthy Control Groups

Six studies of moderate quality used healthy control groups to investigate body image (Barber, 2001; Haedt-Matt et al., 2012; Mayer et al., 2008; Rotenberg et al., 2004; Smith & Rieger, 2010; Taylor & Cooper, 1992). Similar to Plies & Florin (1992), two studies found that a low or negative MIP increased body size dissatisfaction (the difference between perceived and desired size) and negative body image, respectively, when compared to a positive MIP (Rotenberg et al., 2004; Taylor & Cooper, 1992). There was a trend towards an increase in body size estimation, which became significant in a sub-sample of participants with high pre-MIP body concerns (Taylor & Cooper, 1992). Limitations of these studies include an inappropriate control group, e.g., positive mood induction, which may increase the likelihood of a significant difference being found between the two groups. In addition, the MIP had not been described as previously validated, it had low ecological validity, possible demand characteristics were present in the MIP instructions and the measurement of mood (e.g., only two emotions were sampled post-MIP), all of which reduce the possibility that a genuine mood was produced. In a study with similar limitations, apart from the use of an appropriate control condition, Haedt-Matt et al. (2012) found that a sadness MIP significantly increased body shape and weight dissatisfaction in healthy controls compared to those in the neutral MIP. While Mayer et al. (2008) found that a disgust manipulation on matched undergraduate participants had no effect on eating disorder symptoms (e.g., body esteem, restraint, body change strategies) when compared to a control manipulation. Study limitations included the

use of non-clinical samples, and no information regarding the validity or theory behind the MIP was reported.

The results of these studies indicate that among groups with eating disorders, analogue samples, and healthy controls, a negative, sad, low, depressed or angry mood, respectively, can lead to increases in body size estimation and/or increased body shape and weight concerns (Baker et al., 1995; Carter et al., 1996; Cohen-Tovée, 1993; Fox et al., 2013; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992; Rotenberg et al., 2004; Taylor & Cooper, 1992; Wildes et al., 2012). However, methodological limitations related to the study design, e.g., inappropriate control group and/or condition, validity of the MIP method, demand characteristics, and measurement of only one or two emotions post-MIP, were common findings amongst the studies.

DISCUSSION

Authors such as Fox and Power (2009), Hatch et al. (2010) and Haynos & Fruzzetti (2011) have proposed that emotions and emotion regulation difficulties are at the heart of eating disorders. Consequently, the importance of good quality research is paramount in developing our understanding of how these difficulties manifest and are maintained within EDs. The use of mood induction procedures (MIPs) have become an important method for establishing cause and effect relationships between mood and eating disorders symptoms. However, MIP methods have frequently been criticised over their validity and reliability (Buchwald, Strack & Coyne, 1981; Larsen & Sinnett, 1991).

In light of these issues, the aim of the review was to critically review the literature using mood induction procedures (MIPs) in body image research. The review aimed to establish: 1) What are the methodological strengths and weaknesses of mood induction procedures in body image research? 2) What are the key findings from the literature using mood induction procedures in body image research? 3) What recommendations can be made for future research using mood induction procedures in body image research?

Summary of Review findings

Of the fifteen studies reviewed, one study was found to be of strong quality, while the remaining fourteen received a moderate rating. This indicates that within the

literature pertaining to MIPs in body image research, significant study quality and methodological issues exist and therefore findings need to be treated with caution.

Regarding the body image key findings, the strong quality rated study found evidence that experiencing negative emotions can cause an increase in cognitive eating disorder symptoms among women in the acute stages of anorexia nervosa (Wildes et al., 2012). A similar pattern of results was also found in studies of moderate quality rating, providing evidence that among groups with eating disorders, analogue samples, and healthy controls, a negative, sad, low, depressed or angry mood, respectively, can lead to an increase in body size estimation and/or body shape and weight concerns (Baker et al., 1995; Carter et al., 1996; Cohen-Tovée, 1993; Fox et al., 2013; Haedt-Matt et al., 2012; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992; Taylor & Cooper, 1992). While the consensus between the strong and moderate quality rated studies is encouraging, due to methodological limitations (demand effects, validity of MIP methods), the results from the moderate quality rated studies need to be approached with caution.

Methodological weaknesses

The review highlighted particular weaknesses in study design and MIP methods amongst the moderately rated studies. These issues pose a threat to individual study results and the development of the wider literature area. Some of the main study weaknesses will be discussed below.

Quasi-experimental design

The majority of moderately quality rated studies compared clinical or analogue samples with healthy control groups. This introduces group differences before the experiment has begun, and thus limits conclusions regarding the effect of the MIP on body image. While most studies controlled for important confounding variables, such as levels of depression, other unknown group differences may affect study findings. For example, alexithymia is associated with EDs and analogue samples, however it is not commonly controlled for in study design or analyses. This issue is particularly pertinent as all of the reviewed studies used self-report measures, which may be influenced by deficits in emotional awareness (alexithymia). This issue highlights the importance of using equivalent groups for the development of the research area.

Validity of Mood Induction Procedure

While studies can check whether an MIP induced the desired mood state through participant self-report measures, use of previously validated methods strengthens the reliability and validity of the method and the study results. This matter is particularly relevant in light of the issues discussed previously, e.g., co-morbidity, alexithymia.

Ecological validity

The majority of moderately quality rated studies used MIPs with low ecological validity. Ensuring the generalisability of study findings to situations outside the laboratory is central to research. The use of ecologically valid approaches to emotion induction is paramount for developing the research base and its implications for clinical practice.

Demand effects

Demand effects, such as participant instructions to ‘experience’ a particular mood, were common amongst the moderately quality rated studies. This poses a threat to ensuring the MIP has produced a true effect. Demand effects have been found to be more probable if participants are explicitly told to try and feel a specified mood state (see Larsen & Sinnett, 1991). They will ultimately affect conclusions made about the effect of mood on body image outcome measures, and thus will impact on the wider literature area. It will be essential that future research consider this issue.

Measurement of mood

The majority of moderately rated studies measured one or two moods. This potentially provides cues to guide participant behaviour. Measuring a range of emotions not only reduces demand effects, but also allows the experimenter to assess whether the MIP has unintentionally induced other emotions. This may be particularly important for studies utilising a discrete emotions approach to MIPs (e.g., anger MIP) as opposed to a dimensional approach (e.g., negative affect MIP).

Specificity of mood

One issue with the dimensional approach to MIPs is that it may obscure the possible role of different negative emotions within eating disorders. For example, research has highlighted the importance of anger (Geller, Cockell, Hewitt, Golder & Flett; 2000;

Fox et al., 2013; Fox & Harrison, 2008; Waller et al., 2003), sadness (Espeset, Gulliksen, Nordbø, Skårderud & Holte, 2012; Fox & Power, 2009; Kulbartz-Klatt et al., 1999; Plies & Florin, 1992) and disgust (Davey, Buckland, Tantraw & Dallos, 1998; Fox & Power, 2009; Troop, Treasure & Serpell, 2002) in eating disorders. It has been suggested that anger may play a particularly important role within eating disorders (Fox, 2009), and operate through an ‘emotion coupling’ effect with disgust (Fox et al., 2013). Clinically, it would be useful to understand which emotions may be problematic for people with an ED. On the other hand, basic emotions approaches are not without their difficulties, while research has found it possible to induce one emotion to a greater intensity than another emotion, it may never be possible to induce *only* one emotion (Gross & Levenson, 1995). This presents potential empirical and theoretical limitations for research using basic emotions approaches.

What recommendations can be made for future research using mood induction procedures in body image research?

The results of the review suggest areas for future studies to consider when using MIPs in body image research. The first point relates to experimental design, future studies should consider the use of equivalent sample groups, in which participants are randomly assigned to the experimental MIP, or a control condition, such as a neutral MIP. Important confounding variables, such as levels of depression, should be controlled for in the analysis, or in the experimental design. Research should aim to use measures that have psychometric properties (e.g., demonstrated to have validity and reliability), and clearly document this. Information about selection procedures, experimental blinding arrangements, participant knowledge of the research aims, and reporting of withdrawals and exclusions from the data set should be clearly described.

In terms of the MIP, studies should ideally use MIPs that have been previously validated (e.g., methods and materials should be demonstrated to induce a desired mood). When choosing MIPs, researchers should consider the ecological and face validity of MIPs to enable greater external validity. Studies should describe their methods in sufficient detail to enable replication.

Regarding the measurement of mood, prospective research should consider the use of self-report and objective measures to increase the validity of subjective instruments.

Measures should ideally be administered pre- and post-MIP in order to assess the effect of the induction. In addition, mood measures should sample a range of emotions to reduce demand effects, and to assess other emotions that may have been unintentionally elicited.

In terms of emotion conceptualisation, future research should consider the benefit of using a discrete emotions approach to MIPs within eating disorders research. Research would also benefit from providing mean scores for mood measurements, pre- and post-MIP, in order to assess the intensity of mood. In addition, studies should consider their criteria for a “successful” mood change, i.e., at least a one-point change in the desired direction on a mood measure, and clearly report this in the study.

Finally, prospective research should consider the potential demand effects of using MIP instructions to enter into a specified mood. MIP instructions are a potential threat to the internal and external validity of the study findings.

Body Image findings

The study findings point to a causal role of certain negative emotions in changes within body size estimation and/or shape and weight concerns. Specifically, studies using attitudinal measures of body image (e.g., self-report scales) found that a negative, sad or depressed mood respectively, increased shape and weight concerns in those with AN (Wildes et al., 2012), analogue samples (Baker et al., 1995; Cohen-Tovée, 1993) and healthy participant groups (Haedt-Matt et al., 2012; Rotenberg et al., 2004), when compared to control groups. Similarly, studies using perceptual measures of body image, such as a distorting video images technique, found that a sad or low mood respectively, significantly increased body size/width estimations in those with BN (Kulbartz-Klatt et al., 1999), healthy control groups (Plies & Florin, 1992; Taylor & Cooper, 1992) and analogue samples (Plies & Florin, 1992), when compared to control conditions. In addition, two studies incorporated attitudinal components within perceptual measurements and found that a sad mood induction led to significantly larger differences between “sensed” and actual body width in an analogue sample (Plies & Florin, 1992), while a low mood induction led to a greater

difference between actual and ideal size in a healthy control group, indicating an increase in body dissatisfaction (Taylor & Cooper, 1992).

Studies using body shape silhouettes to measure perceptual aspects of body image found that anger, sad mood (plus food cues) and negative mood respectively, significantly increased current body size estimation in an AN sample (Fox et al., 2013), BN sample (Carter et al., 1996) and analogue sample (Baker et al., 1995), when compared to control conditions. Taken together these study results suggest an effect of “negative” emotions on both attitudinal and perceptual components of body image.

While methodological limitations exist, the individual study results are in line with models that point to the centrality of emotion regulation difficulties in EDs (Fox and Power, 2009; Hatch et al., 2010; Haynos & Fruzzetti, 2011) and research using more objective methods to study emotion (see Hatch et al., 2010; Davies et al., 2011). Although further high quality research is needed, these studies point to important clinical implications for the treatment of eating disorders, including targeting negative affect (e.g., sadness, anger) and emotion regulation strategies.

Strengths and limitations of the review

To our knowledge, this is the first review of MIPs in body image research. It is hoped that this review has drawn attention to methodological difficulties in extant research using MIPs in body image research and has provided useful recommendations for future research. The review results appear consistent with other reviews of MIPs within the general literature (e.g., Brenner, 2000; Martin, 1990; Westermann et al., 1996); therefore the recommendations of this review may be helpful within the broader literature. The individual study findings also appear in line with theories of emotion regulation difficulties within EDs (Fox & Power, 2009; Haynos & Fruzzetti, 2011), in that they support the proposal that these issues are central to maintenance processes within EDs.

One review limitation consists of the bespoke quality evaluation tool. There is inherently some bias in the tool as the items were selected by the researcher; however, they were grounded in the literature (e.g., Brenner, 2000; Martin, 1990; Westermann et al., 1996). In addition, the scoring criterion was pragmatic, i.e., the total possible score was divided into three sections. Consequently, some aspects of the tool may have been scored differently if the original scoring criterion from the Effective Public

Health Practice Project (EPHPP) Quality Assessment Tool For Quantitative Studies (1998) was used.

Conclusions

This review has highlighted the moderate quality of research using mood induction procedures in body image. Common study weaknesses were identified, which pose a threat to the validity and reliability of the study findings, and consequently to the development of the research base on emotion difficulties within body image. While study findings indicated a causal relationship between negative emotions and changes in body size estimation and/or shape and weight concerns, further high-quality research is needed to confirm support for these findings. It is hoped that this review has provided recommendations for future research to develop this literature area.

REFERENCES

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: American Psychiatric Association.
- Baker, J.D., Williamson, D.A., & Sylve, C. (1995). Body Image Disturbance, Memory Bias, and Body Dysphoria: Effects of Negative Mood Induction. *Behavior Therapy*, *26*, 747-759. DOI: 10.1016/S005-7894(05)80043-7
- Barber, N. (2001). Gender Differences in Effects of Mood on Body Image. *Sex Roles*, *44*(1/2), 99-108. DOI: 10.1023/A:1011042001463
- Barrett, L. F., & Bliss-Moreau, E. (2009). Affect as a psychological primitive. *Advances in Experimental Social Psychology*, *41*, 167–218. DOI:10.1016/S0065-2601(08)00404-8
- Brenner, E. (2000). Mood Induction in Children: Methodological Issues and Clinical Implications. *Review of General Psychology*, *4*(3), 264-283. DOI: 10.1037//1089-2680.4.3.264
- Brockmeyer., T., Holtforth, M.G., Bents, H., Kämmerer, A., Herzog, W., & Friederich, H.C. (2012). Starvation and emotion regulation in anorexia nervosa. *Comprehensive Psychiatry*, *53*(5), 496–501. DOI: 10.1016/j.comppsy.2011.09.003
- Buchwald, A.M., Strack, S., & Coyne, J.C. (1981). Demand Characteristics and the Velten Mood Induction Procedure. *Journal of Consulting and Clinical Psychology*, *49*(3), 478-479. DOI: 10.1037/0022-006X.49.3.478
- Bydlowski, S., Corcos, M., Jeammet, P., Paterniti, S., Berthoz, S., Laurier, C.,...Consoli, S.M. (2005). Emotion-Processing Deficits in Eating Disorders. *International Journal of Eating Disorders*, *37*, 321–329. DOI: 10.1002/eat.20132
- Cacioppo, J.T., Gardner, W.L., & Berntson, G.G. (1999). The Affect System Has Parallel and Integrative Processing Components: Form Follows Function. *Journal of Personality*

and Social Psychology, 76, 839– 855. DOI: 10.1037/0022-3514.76.5.839

- Carter, F.A., Bulik, C.M., Lawson, R.H., Sullivan, P.F., & Wilson, J.S. (1996). Effect of Mood and Food Cues on Body Image in Women with Bulimia and Controls. *International Journal of Eating Disorders*, 20(1), 65-76. DOI: 10.1002/(SICI)1098-108X(199607)20:1<65::AID-EAT8>3.0.CO;2-2
- Cash, T.F. & Deagle, E.A. (1997). The Nature and Extent of Body-Image Disturbances in Anorexia Nervosa and Bulimia Nervosa: A Meta-Analysis. *International Journal of Eating Disorders*, 22, 107-125. DOI: 10.1002/(SICI)1098-108X(199709)22:23.0.CO;2-J
- Cash, T.F., Fleming, E.C., Alindogan, J., Steadman, L. & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders*, 10, 103-113. DOI: 10.1080/10640260290081678
- Clark, D. M. (1983). On the Induction of Depressed Mood in the Laboratory: Evaluation and Comparison of the Velten and Musical Procedures. *Advances in Behaviour Research and Therapy*, 5(1), 27-49. DOI: 10.1016/0146-6402(83)90014-0
- Coelho, J.S., Carter, J.C., McFarlane, T., & Polivy, J. (2008). “Just looking at food makes me gain weight”: Experimental induction of thought-shape fusion in eating-disordered and non-eating disordered women. *Behaviour Research and Therapy*, 46, 219-228. DOI: 10.1016/j.brat.2007.11.004
- Cohen-Tovée, E. (1993). Depressed Mood and Concern with Weight and Shape in Normal Young Women. *International Journal of Eating Disorders*, 14(2), 223-227. DOI: 10.1002/1098-108X(199309)14:2<223::AID-EAT2260140213>3.0.CO;2-G
- Cooper, M.J., Wells, A., & Todd, G. (2004). A cognitive model of bulimia nervosa. *British Journal of Clinical Psychology*, 43(1), 1-16. DOI: 10.1348/014466504772812931
- Cooper, P.J., Taylor, M.J., Cooper, Z. & Fairburn, C.G. (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

Davey, G.C.L., Buckland, G., Tantow, B., & Dallos, R. (1998). Disgust and Eating Disorders. *European Eating Disorders Review*, 6, 201-211. DOI: 10.1002/(SICI)1099-0968(199809)6:3<201::AID-ERV224>3.0.CO;2-

Davies, H., Schmidt, U., Stahl, D., & Tchanturia, K. (2011). Evoked Facial Emotional Expression and Emotional Experience in People with Anorexia Nervosa. *International Journal of Eating Disorders*, 44(6), 531-9. DOI: 10.1002/eat.20852

Effective Public Health Practice Project (1998). Quality Assessment Tool for Quantitative Studies. Available at http://www.ehphp.ca/PDF/Quality%20Assessment%20Tool_2010_2.pdf

Ekman, P. (1982). (Ed.) *Emotion in the human face* (2nd ed.). Cambridge, UK: Cambridge University Press.

Ellard, K.K., Farchione, T.J., Barlow, D.H. (2012). Relative Effectiveness of Emotion Induction Procedures and the Role of Personal Relevance in a Clinical Sample: A Comparison of Film, Images, and Music. *Journal of Psychopathology and Behavioral Assessment*, 34, 232-243. DOI 10.1007/s10862-011-9271-4

Espeset, E.M.S., Gulliksen, K.S., Nordbø, R.H.S., Skårderud, F., & Holte, A. (2012). The Link Between Negative Emotions and Eating Disorder Behaviour in Patients with Anorexia Nervosa. *European Eating Disorders Review*, 20, 451-460. DOI: 10.1002/erv.2183

Forbush, K., & Watson, D. (2006). Emotional Inhibition and Personality Traits: A Comparison of Woman with Anorexia, Bulimia, and Normal Controls. *Annals of Clinical Psychiatry*, 18(2), 115-121. DOI: 10.1080/10401230600614637

Fox, J.R.E. (2009). A Qualitative Exploration of the Perception of Emotions in Anorexia

Nervosa: A Basic Emotion and Developmental Perspective. *Clinical Psychology and Psychotherapy*, 16(4), 276–302. DOI:10.1002/cpp.631

Fox, J.R.E., Federici, A., & Power, M.J. (2012). Emotions and Eating Disorders. In J. R.E. Fox, & K. Goss (Eds.), *Eating and its Disorders* (pp. 167-197). Chichester, West Sussex: Wiley-Blackwell.

Fox, J.R.E., Grange, N., & Power, P. (2014). Self-Disgust in Eating Disorders: A Review of the Literature and Clinical Implications. In Philip A. Powell, Paul G. Overton & Jane Simpson (Eds.), *The Revolting Self: Perspectives on the Psychological, Social, and Clinical Implications of Self-Directed Disgust*. Karnac Publishers.

Fox, J.R.E., & Harrison, A. (2008). The Relation of Anger to Disgust: The Potential Role of Coupled Emotions within Eating Pathology. *Clinical Psychology and Psychotherapy*, 15(2), 86–95. DOI: 10.1002/cpp.565

Fox, J.R.E., & Power, M.J. (2009). Eating Disorders and Multi-Level Models of Emotion: An Integrated Model. *Clinical Psychology and Psychotherapy*, 16(4), 240-267. DOI:10.1002/cpp.626

Fox, J.R.E., Smithson, E., Baillie, S., Ferreira, N., Mayr, I. & Power, M.J. (2013). Emotion Coupling and Regulation in Anorexia Nervosa. *Clinical Psychology and Psychotherapy*, 20, 319-333. DOI: 10.1002/cpp.1823

Freeman, R.J., Thomas, C.D., Solyom, L. & Hunter, M.A. (1984). A modified video camera for measuring body image distortion: Technical description and reliability. *Psychological Medicine*, 14, 411-416. DOI: 10.1017/S0033291700003652

Friederich, H. C., Kumari, V., Uher, R., Riga, M., Schmidt, U., Campbell, I. C., ... Treasure, J. (2006). Differential motivational responses to food and pleasurable cues in anorexia and bulimia nervosa: A startle reflex paradigm. *Psychological Medicine*, 36, 1327–1335. DOI: 10/1017/S0033291706008129

- Geller, J., Cockell, S.J., Hewitt, P.L., Goldner, E.M., & Flett, G.L. (2000). Inhibited Expression of Negative Emotions and Interpersonal Orientation in Anorexia Nervosa. *International Journal of Eating Disorders*, 28(1), 8–19. DOI: 10.1002/1098-108X(200007)28:13.0.CO;2-U
- Godart, N.T., Perdereau, F., Rein, Z., Berthoz, S., Wallier, J., Jeammet, P., & Flament, M.F. (2007). Comorbidity studies of eating disorders and mood disorders. Critical review of the literature. *Journal of Affective Disorders*, 97, 37–49. DOI: 10.1016/j.jad.2006.06.023
- Gordon, C. M., Dougherty, D. D., Fischman, A. J., Emans, S. J., Grace, E., Lamm, R.,...Rauch, S.L. (2001). Neural substrates of anorexia nervosa: A behavioral challenge study with positron emission tomography. *The Journal of Pediatrics*, 139, 51–57. DOI: 10.1067/mpd.2001.114768
- Gross, J.J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology*, 2(3), 271-299. DOI: 10.1037/1089-2680.2.3.271
- Gross, J.J., & Levenson, R.W. (1995). Emotion Elicitation Using Films. *Cognition and Emotion*, 9,(1), 87-108. DOI: 10.1080/02699939508408966
- Haedt-Matt, A.A., Zalta, A.K., Forbush, K.T., & Keel, P.K. (2012). Experimental evidence that changes in mood cause changes in dissatisfaction among undergraduate women. *Body Image*, 9, 216-220. DOI: 10.1016/j.bodyim.2011.11.004
- Harney, M.B., & Bardone-Cone, A.M. (2014). The Influence of Body Dissatisfaction on Set Shifting. *Cognitive Therapy and Research*, 38, 439-448. DOI 10.1007/s10608-014-9612-1
- Hatch, A., Madden, S., Kohn, M., Clarke, S., Touyz, S., & Williams, L.M. (2010). Anorexia Nervosa: Towards An Integrative Neuroscience Model. *European Eating Disorders Review*, 18, 165–179. DOI: 10.1002/erv.974
- Haynos, A.F., & Fruzzetti, A.E. (2011). Anorexia Nervosa as a Disorder of Emotion

Dysregulation: Evidence and Treatment Implications. *Clinical Psychology: Science and Practice*, 18, 183–202. DOI: 10.1111/j.1468-2850.2011.01250.x

Izard, C.E. (1971). *The face of emotion*. New York: Appleton-Century-Crofts.

Kulbartz-Klatt, Y.J., Florin, I. & Pook, M. (1999). Bulimia nervosa: Mood changes do have an impact on body width estimation. *British Journal of Clinical Psychology*, 38, 279-287. DOI: 10.1348/014466599162854

Larsen, R.J., & Sinnett, L.M. (1991). Meta-analysis of Experimental Manipulations: Some Factors Affecting the Velten Mood Induction Procedure. *Personality and Social Psychology Bulletin*, 17, 323-334. DOI: 10.1177/0146167291173013

Lattimore, P., Gowers, S., & Wagner, H. L. (2000). Autonomic Arousal and Conflict Avoidance in Anorexia Nervosa: A Pilot Study. *European Eating Disorders Review*, 8, 31–39. DOI: 10.1002/(SICI)1099-0968(200002)8:1<31::AID-ERV298>3.0.CO;2-4

Lench, H. C., Flores, S. A., & Bench, S. W. (2011). Discrete Emotions Predict Changes in Cognition, Judgment, Experience, Behavior, and Physiology: A Meta-Analysis of Experimental Emotion Elicitations. *Psychological Bulletin*, 137(5), 834–855. DOI: 10.1037/a0024244

Lindquist, K.A., Siegel, E.H., Quigley, K.S & Barrett, L.F. (2013). The Hundred-Year Emotion War: Are Emotions Natural Kinds or Psychological Constructions? Comment on Lench, Flores, and Bench (2011). *Psychological Bulletin*, 139(1), 255-263. DOI: 10.1037/a0029038

Martin, M. (1990). On the Induction of Mood. *Clinical Psychology Review*, 10, 669-697. DOI: 10.1016/0272-7358(90)90075-L

Mayer, B., Bos, A.E.R., Muris, P., Huijding, J., & Vlieland, M. (2008). Does disgust enhance eating disorder symptoms? *Eating Behaviors*, 9, 124-127. DOI: 10.1016/j.eatbeh.2007.07.003

- Moher, D., Liberti, A., Tetzladd, J., Altman, D.G.; PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*, 339,b2535. DOI: 10.1136/bmj.b2535
- Oatley, K., & Johnson-Laird, P.N. (1987). Towards a Cognitive Theory of Emotions. *Cognition and Emotion*, 1, 29–50. DOI: 10.1080/02699938708408362
- Perpina, C., Leonard, T., Treasure, J., Bond, A., & Banos, R. (1998). Selective Processing of Food- and Body-Related Information and Autonomic Arousal in Patients with Eating Disorders. *Spanish of Journal of Psychology*, 1, 3–10. DOI: 10.1017/S1138741600005357
- Plies, I., & Florin, K. (1992). Effects of Negative Mood Induction on the Body Image of Restrained Eaters. *Psychology and Health*, 7, 235–242. DOI: 10.1080/08870449208520024
- Power, M., & Dalgleish, T. (1997). *Cognition and emotion: From order to disorder*. Hove, UK: Psychology Press, Taylor and Francis Group.
- Rastam, M., Gillberg, C., Gillberg, I.C., Johansson, M. (1997). Alexithymia in anorexia nervosa: a controlled study using the 20-item Toronto Alexithymia Scale. *Acta Psychiatrica Scandinavica*, 95, 385–388. DOI: 10.1111/j.1600-0447.1997.tb09650.x
- Rieger, E., Schotte, D.E., Touyz, S.W., Beumont, P.J.V., Griffiths, R., & Russell, J. (1998). Attentional Biases in Eating Disorders: A Visual Probe Detection Procedure. *International Journal of Eating Disorders*, 23, 199–205. DOI: 10.1002/(SICI)1098-108X(199803)23:2<199::AID-EAT10>3.0.CO;2-W
- Rotenberg, K.J., Taylor, D., & Davis, R. (2004). Selective Mood-Induced Body Image Disparagement and Enhancement Effects: Are They Due to Cognitive Priming or Subjecting Mood? *International Journal of Eating Disorders*, 35(3), 317-332. DOI: 10.1002/eat.10263

- Seeger, G., Braus, D. F., Ruf, M., Goldberger, U., & Schmidt, M. H. (2002). Body image distortion reveals amygdala activation in patients with anorexia nervosa - a functional magnetic imaging study. *Neuroscience Letters*, *326*, 25–28. DOI: 10.1016/S0304-3940(02)00312-9
- Shafran, R., Lee, M., Cooper, Z., Palmer, R. L., & Fairburn, C. G. (2008). Attentional Bias in Eating Disorders. *International Journal of Eating Disorders*, *40*, 369–380. DOI: 10.1002/eat.20375
- Skrzypek, S., Wehmeier, P.M. & Remschmidt, H. (2001). Body image assessment using body size estimation in recent studies on anorexia nervosa. A brief review. *European Child & Adolescent Psychiatry*, *10*, 215-221. DOI: 10.1007/s007870170010
- Slade, P.D. (1994). What is Body Image? *Behavior Research and Therapy*, *32* (5), 497-502. DOI: 10.1016/0005-7967(94)90136-8
- Smith, E., & Rieger, E. (2010). An Investigation of the Effect of Body Dissatisfaction on Selective Attention Toward Negative Shape and Weight-Related Information. *International Journal of Eating Disorders*, *43*, 358-364. DOI: 10.1002/eat.20703
- Taylor, M.J. & Cooper, P.J. (1992). An Experimental Study of the Effect of Mood on Body Size Perception. *Behaviour Research and Therapy*, *30*(1), 53-58. DOI: 10.1016/0005-7967(92)90096-Y
- Troop, N.A., Treasure, J., & Serpell, L. (2002). A Further Exploration of Disgust in Eating Disorders. *European Eating Disorders Review*, *10*, 218-226. DOI: 10.1002/erv.444
- Velten, E. (1968). A Laboratory Task for Induction of Mood States. *Behaviour Research and Therapy*, *6*, 473–482. DOI:10.1016/0005-7967(68)90028-4
- Waller, G., Babbs, M., Milligan, R.J., Meyer, C., Ohanian, V. & Leung, N. (2003). Anger and Core Beliefs in the Eating Disorders. *International Journal of Eating Disorders*, *34* (1), 118–124. DOI: 10.1002/eat.10163

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, 98, 219-235. DOI: 10.1037/0033-2909.98.2.219

Westermann, R., Spies, K., Stahl, G., & Hesse, F.W. (1996). Relative effectiveness and validity of mood induction procedures: a meta-analysis. *European Journal of Social Psychology*, 26, 557-580. DOI: 10.1002/(SICI)1099-0992(199607)26:4<557::AID-EJSP769>3.0.CO;2-4

Wildes, J.E., Marcus, M.D., Bright, A.C., & Dapelo, M.M. (2012). Emotion and Eating Disorder Symptoms in Patients with Anorexia Nervosa: An Experimental Study. *International Journal of Eating Disorders*, 45, 876-882. DOI: 10.1002/eat.2202

Williamson, D.A., Gleaves, D.H., Watkins, P.C. & Schlundt, D.G. (1993). Validation of self-ideal body size discrepancy as a measure of body dissatisfaction. *Journal of Psychopathology and Behavioral Assessment*, 15, 57-68. DOI: 10.1007/BF00964324

Zonneville-Bender, M. J. S., van Goozen, S. H. M., Cohen- Kettenis, P. T., Jansen, L. M. C., van Elburg, A., & van Engeland, H. (2005). Adolescent anorexia nervosa patients have a discrepancy between neurophysiological responses and self-reported emotional arousal to psycho- social stress. *Psychiatry Research*, 135, 45–52. DOI: 10.1016/j.psychres.2004.11.006

Zonneville-Bender, M.J.S., van Goozen, S.H.M., Cohen-Kettenis, P.T., van Elburg, A., & van Engeland, H. (2002). Do adolescent anorexia nervosa patients have deficits in emotional functioning? *European Child and Adolescent Psychiatry*, 11, 38–42. DOI: 10.1007/s007870200006

Paper Two

The Relation of Sadness to Disgust: The Potential Role of Coupled Emotions Within Eating Behaviour.

Prepared in accordance with author guidelines for submission to *Clinical Psychology and Psychotherapy* (see Appendix 2)

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ABSTRACT

Background: Research has found evidence for the theoretical concept of ‘emotion coupling’ between anger and disgust in analogue and Anorexia Nervosa (AN) populations, and has linked this to changes in specific eating disorder pathology in people with AN. **Objective:** This study aimed to investigate a hypothesised ‘emotion coupling’ effect between sadness and disgust in people with high eating concerns (HEC), and whether it may be linked to changes in body size estimation. **Method:** A sadness mood induction procedure (MIP) was utilised to explore the ‘emotion coupling effect.’ Participants with HEC (n=26) and those with low eating concerns (LEC) (n=23) completed measures of eating pathology and emotion regulation strategies. Directly before a laboratory-based sadness MIP, questionnaires related to body size estimation, sadness and disgust were administered and then repeated following the sadness MIP (i.e., a repeated measures design). **Results:** While both groups showed a statistically significant increase in levels of sadness following the sadness MIP, contrary to the study hypotheses, the HEC group did not show significantly higher levels of sadness, disgust or body size estimation, when compared to the LEC group. The HEC group demonstrated significantly higher levels of emotion suppression and lower levels of cognitive reappraisal, indicating unhelpful emotion regulation strategies, when compared to controls. **Discussion:** The failure to find an ‘emotion coupling’ effect between sadness and disgust in those with high eating concerns was discussed in light of past research and study limitations.

Key Practitioner message

- Emotions and emotion regulation strategies appear difficult for people with high eating concerns.
- The specific role of sadness in those with high eating concerns is still unclear.
- Clinicians should consider how difficulties with ‘negative’ emotions and emotion regulation styles may develop and function to maintain poor body image.

Keywords: high eating concerns, sadness, disgust, basic emotions, emotion regulation

INTRODUCTION

Emotions in Eating Disorders

Emotion regulation has become an important focus for research exploring the development and maintenance of eating disorders (EDs) (e.g., Hatch et al., 2010; Haynos & Fruzzetti, 2011). Emotion regulation refers to the “*processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions* (Gross, 1998, p. 275).” Various ED behaviours may function to either suppress or block painful emotions (Brockmeyer et al., 2012) and research is ongoing to determine which emotions may be particularly significant in EDs, albeit using different conceptualisations of emotions including trait-like approaches (e.g., negative affect; Fairburn, Cooper & Shafran, 2003) and basic emotions perspectives (Fox & Power, 2009). The latter approach posits that a small number of emotions work as building blocks for more complex emotions (e.g., Ekman, 1982; Izard, 1971; Oatley & Johnson-Laird, 1987). There is ongoing debate as to whether emotions can be viewed as being comprised of and built from a core group of basic emotions. In addition, within the basic emotions approach, there is no consensus regarding which emotions should be considered fundamental. In spite of this deliberation, there is agreement that anger, disgust, anxiety (fear), happiness and sadness should be classified as ‘basic emotions’ (Oatley & Johnson-Laird, 1987; Power & Dagleish, 1997).

The relevance of using a basic emotions approach to EDs is demonstrated by accumulating evidence of the importance of particular ‘negative’ basic emotions in EDs, which will be discussed further below. In addition, increased understanding of which emotions may be important in EDs would undoubtedly have clinical implications for treatment of the disorder.

Evidence for the importance of basic emotions in EDs

Anger

Anger has been proposed as an important emotion within EDs. Geller, Cockell, Hewitt, Golder & Flett (2000) found that people with Anorexia Nervosa (AN) suppressed anger more than controls and that anger suppression predicted body dissatisfaction. They also found that those with AN had higher levels of silencing the

self-schemas and interpreted this as evidence for the suppression of negative emotions in order to protect interpersonal relationships. Waller et al. (2003) found higher state anger and anger suppression scores in those with AN and Bulimia Nervosa (BN) compared to controls.

In a series of studies, Fox and colleagues found support for the importance of anger in EDs (Fox & Harrison, 2008; Fox, 2009; Fox & Froom, 2009; Ioannou & Fox, 2009). In a grounded theory study of AN, Fox (2009) found that anger, and to a lesser extent, sadness were viewed as being ‘toxic’ or ‘shaming’ and were inhibited. Anger was discussed as being particularly ‘toxic’ and key in the rise of ED symptoms, while for sadness, its expression was a perceived sign of ‘weakness.’

Disgust

Disgust is another proposed basic emotion that may have a function within of EDs (Fox, Grange & Power, 2014). Disgust is linked to rejection either of undesirable foods or undesirable personal characteristics (see Miller, 1997). Compared to non-ED controls, women with an ED hold higher levels of disgust specifically for food and body related stimuli, rather than displaying heightened disgust sensitivity (Troop, Treasure & Serpell, 2002; Davey, Buckland, Tantrow & Dallos, 1998). This suggests that disgust directed at oneself (self-disgust) is particularly important. The findings of Troop et al. (2002) also found that women with an ED in remission scored significantly lower on disgust measures when compared to those currently ill with an ED, leading to the proposal that increased levels of disgust may be a product of, rather than a causal factor in, eating disorders (Fox, Grange & Power, 2014). Other studies indicate that disgust may be linked to other emotions, such as anxiety (Davey & Chapman, 2009).

Sadness

Sadness also appears to be an important emotion in EDs (Fox & Froom, 2009; Fox & Power, 2009), but the high level of co-morbidity with depression, and the use of broad terms such as “low mood” and “negative affect,” has limited the understanding of sadness in its own right. Several experimental studies have investigated a causal relationship between negative affect/low mood and changes in body size perception/body concerns, using mood induction procedures (MIPs) (Taylor & Cooper, 1992; Rotenberg, Taylor & Davis, 2004; Wildes, Marcus, Bright & Dapelo,

2012). While ‘negative mood’ may incorporate sadness, it may also refer to other negative basic emotions (anger, disgust, fear). Moreover, some studies have referred to using negative MIPs, but have induced a sad mood state, e.g., asking participants to think of a sad event in their life (Plies & Florin, 1992; Kulbartz-Klatt, Florin & Pook, 1999). These studies have found evidence of an effect of sad mood on body image in both clinical and non-clinical groups. For example, using a distorting video images technique to measure body width, a sadness MIP led to increased body width estimates in restrained and unrestrained eaters (Plies & Florin, 1992), and in participants with BN, but not in those with panic disorder or non-clinical controls (Kulbartz-Klatt, et al., 1999).

The SPAARS-ED model and ‘Emotion coupling’ in EDs

One model that integrates extant research and provides a description of how underlying emotion difficulties manifests in EDs, is the Schematic, Propositional, Analogical and Associative Representational Systems in Eating Disorders (SPAARS-ED) model (Fox & Power, 2009). The SPAARS-ED model proposes that EDs are driven by both an avoidance of emotion, via restriction and/or bingeing/vomiting, and the directing of painful emotion onto the body, in the form of self-disgust/shame (Fox & Power, 2009). The model suggests that certain emotions are deemed acceptable or ‘ego syntonic’ to the self, based on the person’s socio-emotive learning history. Anger may be appraised as being unacceptable or ‘ego-dystonic’ and therefore detached from the person’s sense of self. Over time an ego-syntonic emotion may become coupled with an ego-dystonic emotion, whereby the former is used to suppress the latter emotion.

The ‘emotion coupling’ hypothesis has been supported by research evidence. Fox & Harrison (2008) found that following an anger mood induction, levels of anger increased in both healthy control and analogue samples, however, the analogue sample also showed a significant increase in disgust sensitivity that was not demonstrated in the control group. In a follow-up study with an AN sample, Fox et al. (2013) found that as predicted, following an anger induction, levels of anger increased in healthy control and AN groups, but that compared to controls, disgust sensitivity and body size estimation significantly increased in the AN sample.

Fox et al. (2013) reviewed the research supporting the SPAARS-ED model and proposed that people with AN may not feel entitled to experience emotion and

that expressing anger is seen as risking rejection from others (Fox, 2009). AN is frequently associated with poor social skills (Treasure, Corfield, Cardi, 2012), which may be an important causal factor in AN (Schmidt & Treasure, 2006). As losing weight is often regarded as a way to be more valued, thus likeable, and more in control (Fox, Federici & Power, 2012), parallel processes of emotion suppression and weight loss become connected over time. Consequently, the SPAARS-ED model proposes that the suppression of anger in AN becomes ‘coupled’ with the emotion of (self-) disgust.

A similar relationship between sadness and disgust has been proposed by Fox & Power (2009), but has not been investigated experimentally. The SPAARS-ED model discusses the potential role of sadness within EDs, proposing that disgust towards the body may be used to inhibit sadness. In a recent qualitative study of how women with AN manage negative emotions and link this to their ED behaviour, Espeset, Gulliksen, Nordbø, Skårderud, & Holte (2012) found that when women felt sad or depressed they would often experience their body as ‘fat’ and ‘disgusting,’ indicating support for a possible emotion coupling effect between sadness and (self-) disgust.

AIMS & HYPOTHESES

The SPAARS-ED model predicts that people with EDs will have an emotion regulation style that prevents the expression of emotions, which creates an internal world where negative emotions are difficult to experience and are managed via emotion coupling. The SPAARS-ED model proposes that negative emotions, particularly anger, and to a lesser extent sadness, are managed through the emotion of disgust, effectively ‘coupling’ these emotions. While research has found an emotion coupling effect between anger and disgust (Fox & Harrison, 2008; Fox et al., 2013), the relationship between sadness and (self-) disgust has not been experimentally explored. This study aims to test whether sadness has a direct effect upon levels of (self-) disgust and body shape estimation, in those with self-reported eating difficulties.

Hypothesis 1a

Following induction of sad mood, all participants would show a statistically significant difference in mean scores on the Basic Emotions Sadness subscale (BES; Power, 2006) and a sad mood Visual Analogue Scale (VAS) at Time 2 compared to Time 1, with higher mean scores at Time 2.

Hypothesis 1b

Following induction of sad mood, participants in the High Eating Concern (HEC) group would show a statistically significant difference in mean BES Sadness subscale scores and Sadness VAS scores at Time 2 compared to participants in the LEC group, with the HEC group demonstrating higher mean scores.

Hypothesis 2

It was predicted that the HEC group would show a statistically significant difference in disgust, as measured by the Disgust Scale-Revised (DS-R; Olatunju et al., 2007), self-disgust, as measured by the Self-Disgust Scale (SDS; Overton, Markland, Taggart, Bagshaw & Simpson, 2008) and estimation of body size, as measured by body shape silhouettes (BSS), between Time 1 and Time 2 compared to the LEC group, with the HEC group demonstrating higher mean scores.

It was predicted that anxiety and depression, as measured by the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), would co-vary in the analyses.

Hypothesis 3a

It was hypothesised that the HEC group would show a statistically significant difference in mean scores on the Expressive Suppression sub-scale of the Emotion Regulation Questionnaire (ERQ; Gross and John, 2003), compared to the LEC group, with the HEC group demonstrating higher mean scores.

Hypothesis 3b

It is was hypothesised that the HEC group would show a statistically significant difference in mean scores on the Cognitive Reappraisal sub-scale of the ERQ compared to the LEC group, with the HEC group demonstrating lower mean scores.

Exploratory analyses

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) would be investigated to explore possible group differences.

METHODOLOGY

Ethics

This research study was given a favourable ethical decision by the University of Manchester Research and Ethics Committee (UREC), see Appendix 3.

Design

This study utilised a mixed design that incorporated both a between and a within participants design.

Participants

Screening Stage

Female participants were exclusively recruited as part of the study inclusion criteria. Advertisements were placed around the University of Manchester (see Appendix 4) and on an undergraduate psychology course research credit system (in which students participate in a number of studies and collect credits as a mandatory course requirement). Interested parties were directed to a website that contained information about the study (see Appendix 5), a consent form to take part (see Appendix 6), a demographic information questionnaire (see Appendix 7), and a screening questionnaire. The screening questionnaire consisted of the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). The EDE-Q is a quick and reliable measure of eating disorder symptoms, which has published norms (see Mond, Hay, Rodgers, Owen & Beumont, 2004). A global score of 3.09 on the EDE-Q is indicative of clinical caseness for eating pathology with a global score of 1.19 indicating no eating pathology (Mond et al., 2004). N=363 females responded to the advertisements and filled out the above questionnaires. Participants were entered into a prize-draw for taking part in this stage, while those who were selected for the Experimental stage were given four course credits or £7 for their participation.

Experimental Study

The first N=31 respondents who had high eating concerns (HEC) (EDE-Q score ≥ 3.09) were selected for the study (this does not include N=7 participants who did not respond back to the email invitation). The low eating concern (LEC) control group comprised the first 24 respondents with EDE-Q score < 1 . N=10 participants did not respond to the invitation and N=4 responded but did not take part. This EDE-Q cut-off was chosen to ensure that the control group had no eating concerns or difficulties. Due to a shortage of psychology research course credits, control participants who were not looking for credits were prioritised for study participation and N=20 participants in the HEC received credits compared to N=5 participants in the LEC group received credits. There was no significant age difference between the HEC group and the LEC group (HEC=21 years, SD=4.03; LEC=22.63 years, SD=4.62; $t=1.39$, $df=53$; $p=.17$).

Measures and Apparatus

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994).

The EDE-Q is a 36-item self-report measure based on the Eating Disorder Examination (EDE), which is the 'gold standard' for assessing eating disorders (Garner, 2002). The EDE-Q subscales include: eating restraint, eating concern, body shape concern, body weight concern, that are collated to yield an overall global score. There is a high level of agreement between the EDE-Q and the EDE (e.g., Fairburn & Beglin, 1994; Mond et al., 2004). Peterson et al. (2007) found satisfactory psychometrics for the EDE-Q with alpha coefficients ranging from 0.70 to 0.90.

Basic Emotions Scale (BES; Power, 2006).

The BES consists of 20 emotion terms rated on a scale from 1 to 7 labelled from 'not at all' to 'all of the time.' The emotion terms derive from the five basic emotions of 'Anger,' 'Sadness,' 'Disgust,' 'Fear' and 'Happiness' described by Oatley & Johnson-Laird (1987). The BES has a 'state-like' version and a 'trait-like' version. The state version assesses how often an emotion has been experienced over 'the past week,' and the trait version assesses how much 'in general' the participant experiences the emotion. The scale has demonstrated a high degree of internal consistency, with Cronbach alphas ranging from 0.79 on the Happiness subscale to

0.84 on the Sadness subscale (Power, 2006). The present study used the state- and trait-like versions. The wording of the state version was changed for the purpose of this study to reflect how participants felt ‘in the present moment,’ as opposed to the ‘past week.’ This change was made in order to more accurately assess changes in mood state at study Time 1 and Time 2.

Emotion Regulation Questionnaire (ERQ; Gross and John, 2003)

The ERQ is one of the main measures of emotion regulation in research (Spaapen, Waters, Brummer, Stopa & Bucks, 2014). The ERQ has 10-items which measure the habitual use of two emotion regulation strategies: Cognitive Reappraisal (e.g., I control my emotions by *changing the way I’m* thinking about the situation) and Expressive Suppression (e.g., I control my emotions by *not expressing them*). Each item is measured on a seven-point Likert scale (‘strongly disagree’ to ‘strongly agree’) and participants indicate how often they use the corresponding method of emotion regulation. Each subscale gives a score for analysis. Gross & John (2003) reported satisfactory alpha coefficients for the two subscales, which averaged 0.79 for Reappraisal and 0.73 for Suppression subscales.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

The DERS is a 36-item self-report questionnaire designed to assess multiple aspects of emotion regulation difficulties. It includes six subscales: (a) non-acceptance of emotional responses (b) difficulties engaging in goal-directed behaviours when experiencing negative emotions (c) difficulties controlling impulses when experiencing negative emotions (d) lack of awareness of emotional responses (e) limited access to emotion regulation strategies perceived as effective and (f) lack of clarity of emotional responses. Gratz & Roemer (2004) reported high internal consistency for the DERS items, with an alpha coefficient of 0.93, and adequate alpha coefficients for the six subscales, ranging from 0.80 to 0.89.

Disgust Scale-Revised (DS-R; Olatunji et al., 2007)

The DS-R is a 25-item self-report scale measuring three domains of disgust, including core disgust (a sense of offensiveness and threat of contamination), animal reminder disgust (an aversion to stimuli that serves as a reminder of the origins of humans) and contamination disgust (contamination-based disgust sensitivity). The scale includes

two sections, the first section prompts participants to indicate on a five-point Likert scale to what extent they agree or disagree with a disgust-eliciting situation ('strongly agree' to 'strongly disagree'). The second section asks participants to rate how disgusting they would find certain situations using a five-point Likert scale ('not at all disgusting' to 'extremely disgusting'). Olatunji et al. (2007) reported good internal consistency for the DS-R, with an alpha coefficient of 0.84.

Self-Disgust Scale (SDS; Overton et al., 2008)

The SDS is an 18-item self-report measure of disgust directed towards the self, assessing constructs such as 'appearance,' 'general self-concept,' and 'behaviour.' Each statement is rated on a seven-point Likert scale, ranging from 'strongly agree' to 'strongly disagree.' Six of the 18-items are neutral filler statements, which complement the key items while balancing out the negativity of the scale. A total self-disgust score is found by summing scores on the 12 statements related to the three self-disgust constructs. Overton et al. (2008) reported excellent internal consistency within the scale, with a high alpha coefficient of .91 for the 12 self-disgust items.

Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983).

This measure consists of seven items pertaining to anxiety symptoms (HADS-A) and seven items relating to depressive symptoms (HADS-D). A review by Bjelland, Dahl, Haug & Neckelmann (2002) found that a score of 8 or above (out of a total of 21) on both the depression and anxiety subscales detects 80% of cases. Both scales have good internal consistency, with Cronbach alphas of 0.83 on the HADS-D and 0.82 on the HADS-A (Bjelland et al., 2002). Bjelland et al. (2002) also reported good correlations with other extensively used measures, such as the Beck Depression Inventory, which ranged from 0.49 to 0.83.

Sad mood Visual Analogue Scale (Sadness VAS)

The sadness VAS was created for use in the present study. The measure asked participants to indicate how they felt on a scale of 0-10 ('not sad' to 'sad'). The measure was included to assess feelings of sadness, as although this is assessed in the BES, the word 'sadness' is not explicitly mentioned in this instrument.

Body Shape Silhouettes (BSS)

The BSS is a measure of body size estimation. It was adapted from the Body Image Assessment for Obesity (BIA-O; Williamson et al., 2000) measure, as used in Fox et al., (2013). It has two sections, each showing 14 incrementally larger body shapes from very thin to very large. In the first section, participants circle a body silhouette that they feel is closest to their own body size. In the second section, they pick a body silhouette, which they would prefer to look like. Only the first section of the scale was statistically analysed. Body shapes were scored on a scale ranging from 1 to 14 to correspond to the incrementally larger body shapes. Using this measure, Fox et al. (2013) found that following an angry mood induction procedure, body size estimation significantly increased in a AN sample, compared to a healthy control group. Test-retest reliability coefficients for the BIA-O range from 0.77 to 0.93. It correlates positively (.45-.48) with common measures of body dissatisfaction e.g., the Body Shape Questionnaire (Cooper, Taylor, Cooper & Fairburn, 1987) demonstrating convergent validity (Williamson et al., 2000). The adapted BSS measure has no established psychometrics.

Digit Symbol Task

Selected from the Wechsler Adult Intelligent Scale-4th UK Edition (WAIS-IV UK; Wechsler, 2010), this task was used to prevent participants from remembering their answers to the Time 1 measures. Interference tasks have been shown to impact significantly upon levels of recall (e.g., Lustig & Hasher, 2001). Within this test, the numbers 1-9 are paired with symbols on a key presented to the participant. Below the key is a grid of 135 numbers, which are missing their matching symbols. Participants are given 120s to go through the grid and draw as many correct symbols as they can below each number.

Sadness mood induction procedure

A combination of film, autobiographical memory rehearsal and music was chosen for the sad mood induction procedure (MIP). For the film MIP, a 4.40min clip from the feature film, *The Champ* was used. Within this film clip, a boy spends his last moments with his father, who has been fatally injured in a boxing match. This clip was drawn from a set of standardised film clips that have been shown to elicit individual basic emotions (Hewig et al., 2005). Hewig et al. (2005) were able to show

that this clip predominantly induced sadness above other emotions. The clip was shown to participants on a 13inch MacBook Air laptop computer, placed 20 cm away from the participant.

Following the film clip, the researcher removed the laptop computer and placed a piece of writing paper in front of the participant. Participants were given instructions both verbally and in written form to follow a modified Velten technique (Velten, 1968), in order to continue with the sad mood induction (see Appendix 8). This procedure was chosen in order to increase the ecological validity of the original technique, in which negative self-statements were read silently. Participants were instructed to recall a recent or past event, which made them feel sad. They were instructed to write a brief description of this event. This took place in silence until the participant had stopped writing, and at least 3min had elapsed. The written descriptions were independently rated for their potential sadness-inducing qualities (see below).

Following the modified Velten technique, the researcher placed the laptop computer in front of the participant and instructed them to listen to a short music clip. The laptop screen was angled at a near-closed position. Participants listened to a pre-selected 3.15min clip from Beethoven's *Piano Sonata No. 14*. This musical piece was selected for its ability to induce a depressed mood (Trambakolous, 1997).

Following the music clip, the main room lights were switched back on and the sheet containing the completed modified Velten technique task was removed.

Happy mood induction procedure

A positive mood induction task was included at the end of the study, consisting of the same written instructions for the sad mood modified Velten technique, but participants were asked to think of a "happy" event instead. This task was included to remove the effects of the sad mood induction, and was not part of the study dataset.

Procedure

Experimental study

Participants were tested individually within a large, quiet room within the University. Participants sat at a desk, which had a small lamp placed approximately

3m away on the right-hand side. The experimenter (NB) sat outside the participants line of vision throughout the study.

Participants were given time to read over the Participant Information Sheet (see Appendix 5) and ask questions about the study before taking part and then asked to sign the study consent form and give details of GP contact details as a health and safety precaution. Participants were then administered a battery of questionnaires (Time 1), in the following order: BSS, Sad mood VAS, BES (state and trait versions), DERS, ERQ, DS-R, SDS, HADS. Once the questionnaires were finished, the Digit Symbol Task was administered.

Following completion of the Digit Symbol Task, the sad mood induction procedure was introduced. The main lights of the room were switched off, and the small table lamp switched on. After completing the mood induction, the room lights were switched on and participants were administered a repeat battery of questionnaires (Time 2), in the following order: Sad mood VAS, BSS, BES (state version), DS-R, SDS. Finally, the positive mood induction task was administered.

Following this task, participants were informed the study was finished. Participants were debriefed, and it was checked that they were not distressed and were fine to leave the room. All participants reported that they were okay, and had no difficulties at the end of the study.

Reliability of Sadness Induction Technique

In order to check that the written reports of sadness-eliciting material supplied by the participants would lead to an increase in sadness, two independent assessors, blind to the study's hypotheses, evaluated them. The assessors rated whether these autobiographical events would make a person sad, and whether the scenarios could have induced another emotion. After they made their initial assessment, they discussed their ratings with each other. Each assessor was also given a sample of HEC and control group material, and was asked to compare the autobiographical events to see if there were any differences in the types of scenarios generated by the participants. Both assessors agreed that 96% of the scenarios would elicit sadness, but felt two scenarios may have elicited both sadness and another emotion equally; one of these scenarios was decided to be included in the analyses on discussion with the researcher. The assessors identified that an average of 50% of the scenarios could have elicited an emotion other than sadness, but agreed that sadness was the strongest

emotion within 96% of reports. The researcher felt that a further 5 scenarios should be excluded as they induced other strong emotions, such as anger. Therefore, N=6 participants were excluded from the original sample (N=55), N=5 from the experimental group, N=1 from the control group. In addition, the independent assessors found some differences between the two groups, when a sample of scenarios was compared. The assessors indicated that one of the groups (the experimental group) tended to include more traumatic life events, potentially indicating some qualitative differences between groups.

Statistical strategy

All statistical analyses were conducted using SPSS version 22 for Mac OS X Version 10.7.5.

Preliminary analyses were conducted on HADS Depression and Anxiety scores using two Independent t-tests, comparing mean scores between groups.

For Hypothesis 1a, scores on the Sadness VAS and BES Sadness subscale for Time 1 and Time 2 were evaluated within groups using a paired t-test for each measure. Additional analyses took place on the remaining four BES subscale scores. Paired t-tests were used to analyse changes from Time 1 to Time 2 on each BES subscale, for each group. To reduce Type 1 error, the probability level was set at 0.01 for the BES comparisons.

For Hypothesis 1b and Hypothesis 2, inspection of the means for Time 1 dependent variables suggested that the two groups might differ on pre-test measures. Therefore, an initial multivariate analysis between the five variables at Time 1 and Time 2 was conducted, respectively. The statistic reported is the Hotelling's statistic. Following the Hotelling's analysis, Independent t-tests were undertaken. To protect against type 1 error, a probability level was set at 0.01. Individual t-tests found the two groups differed significantly on all Time 1 and Time 2 measures, except for the DS-R measure, therefore separate analyses for each dependent variable were conducted using one-way analysis of covariance (ANCOVA). Within the ANCOVA, Time 1 scores for each dependent variable were used as a covariate, in addition to anxiety and depression scores (taken from the HADS); the Time 2 dependent measure was entered as the dependent variable. A probability level was set at 0.05. Effect sizes were calculated using the formula for η^2 (eta-squared) from Clark-Carter (2004). These η^2 values were interpreted as per Cohen (1988) who suggested that η^2 values of

0.01 are a small effect, 0.059 are a medium effect, whilst a η^2 value of 0.138 can be regarded as a large effect size.

For Hypothesis 3, between group scores on the two subscales of the Emotion Regulation Questionnaire (ERQ) were evaluated using two separate Independent t-tests. In order to protect against Type 1 error, a probability level was set at 0.025.

The DERS would be evaluated with between group Independent t-tests for each subscale and total score. To reduce Type 1 error, the probability level was set at 0.008.

Power analysis

The power analysis was based on the Disgust Scale-Revised (DS-R) measure from the principal hypothesis, Hypothesis 2. The power analysis used the DS-R Time 2 results from the study reported in Fox et al. (2013). The sample size/power calculations were established by comparing between subject means between two groups using a two-sample t-test at the conventional two-sided 5% significant level (alpha 0.05). With 25 participants in each group (50 total participants) the study was calculated to have 80% power to detect effect sizes of at least 0.809 between both groups.

RESULTS

Preliminary analyses

There was a significant group difference in mean HADS score for the Depression subscale (HEC=6.42, SD=4.34; LEC=2.69, SD=2.2; $t=3.70$, $df=47$, $p<.001$) and Anxiety subscale (HEC=11.58, SD=4.63; LEC=4.78, SD=2.96; $t=6.02$, $df=47$, $p<.01$). The HEC group had significantly higher Depression and Anxiety Scores, with Anxiety scores indicating probable presence of a 'mood disorder' (≥ 11) (Snaith, 2003).

Main Hypothesis Testing

Hypothesis 1a

It was predicted that following induction of sad mood, all participants would show a statistically significant difference on mean Sadness VAS and BES Sadness subscales scores at Time 2 compared to Time 1, with higher mean scores at Time 2. The results

of the paired t-tests are presented in Table 4. The Time 2 mean Sadness VAS score and mean BES Sadness subscale score for the HEC group and LEC group, respectively, was significantly higher than Time 1 scores. Hypothesis 1a was therefore supported.

Table 4: The means, standard deviations, t-values and probability levels for the Sadness Visual Analogue Scale (VAS) and Basic Emotion Scale (BES) subscale Time 1 and Time 2 scores for within participant groups analyses (Hypothesis 1a).

| | | Time 1 BES scores | Time 2 BES scores | t-value | Prob. levels |
|-----------------------------------|-----------|----------------------|----------------------|---------|--------------|
| HEC group mean (SD) N=26 | Sad VAS | 3.89 (2.08) | 6.39 (2.16) | -5.13 | ≤0.001** |
| | Anger | 9.23 (4.83) | 10.62 (5.78) | -1.22 | >0.05 |
| | Sadness | 8.96 (5.26) | 14.46 (6.1) | -4.91 | <0.001** |
| | Disgust | 11.77 (8.17) | 11.73 (8.36) | .047 | >.05 |
| | Fear | 15.89 (7.04) | 15.92 (6.22) | -.031 | >.05 |
| | Happiness | 15.58 (6.57) | 11.27 (5.81) | 3.25 | <0.01* |
| LEC group mean (SD) N=23 | Sad VAS | 1.41 (1.43) | 3.74 (2.39) | -5.14 | ≤0.001** |
| | Anger | 6.44 (3.6) | 5.83 (2.59) | 1.11 | >0.05 |
| | Sadness | 5.3 (2.53) | 8.61 (4.36) | -3.78 | ≤0.001** |
| | Disgust | 6.35 (3.24) | 6.22 (2.37) | .25 | >0.05 |
| | Fear | 8.91 (4.38) | 7.44 (4.37) | 1.63 | >0.05 |
| | Happiness | 18.39 (5.52) | 14.96 (6.02) | 2.99 | <0.01* |

* Denotes significance at the 0.01 level. **Denotes significance at the 0.001 level.

Additional analyses:

BES subscale group means

Looking at the Time 2 HEC group means, the Fear subscale is slightly higher than the Sadness subscale, however the Fear subscale score was not significantly different from the Time 1 scores. Looking at the LEC group, the Happiness subscale mean score received the highest rating at Time 2, however, it had significantly decreased from Time 1 scores.

Hypothesis 1b and 2

Multivariate analysis

The initial analysis was a multivariate Hotelling's trend analysis. This applied to all variables in Hypothesis 1b and Hypothesis 2, namely, the Sadness VAS, the BES Sadness subscale, the DS-R, SDS and BSS. The analysis for Time 1 scores showed a

significant group effect, $F=6.6$ (5,41), $p=.000$. The analysis for Time 2 scores also showed a significant group effect, $F=4.83$ (5,41), $p=.001$. Table 5 displays the means and standard deviations for Time 1 and Time 2 dependent variables for each group, and the results from the Independent t-tests, probability levels and effect sizes.

Table 5: The means, standard deviations, t-values and effect sizes for the Sadness Visual Analogue Scale (VAS), Basic Emotion Scale (BES) Sadness subscale, Disgust Sensitivity Scale (DS-R), Self-Disgust Scale (SDS) and Body Shape Silhouettes (BSS) measures for Time 1 and Time 2 measures across participant groups (Hypothesis 1b and 2).

| | | HEC group (SD) N=26 | LEC group (SD) N=23 | t-value | Prob levels | Cohen's <i>d</i> |
|---------------|---------|----------------------------------|----------------------------------|----------------|--------------------|-------------------------|
| Time 1 | Sad VAS | 3.88 (2.09) | 1.41 (1.43) | 4.79 | <.001* | 1.40 |
| | Sad BES | 8.96 (5.26) | 5.3 (2.53) | 3.04 | <.005* | 0.94 |
| | DS-R | 57.7 (17.26) | 47.87 (16.11) | 2.05 | <0.047 | 0.59 |
| | SDS | 48.77 (16.07) | 24.26 (8.81) | 6.5 | <.001* | 1.97 |
| | BSS | 6.38 (1.58) | 3.57 (1.67) | 6.07 | <.001* | 1.73 |
| Time 2 | Sad VAS | 6.38 (2.16) | 3.74 (2.4) | 4.07 | <.001* | 1.16 |
| | Sad BES | 14.46 (6.1) | 8.61 (4.36) | 3.84 | <.001* | 1.12 |
| | DS-R | 57.65 (18.08) | 47.65 (15.69) | 2.06 | <0.046 | 0.59 |
| | SDS | 47.42 (19.37) | 25.35 (10.17) | 4.9 | <.001* | 1.49 |
| | BSS | 6.23 (1.68) | 3.43 (1.6) | 5.96 | <.001* | 1.71 |

*Denotes significant at 0.01. Cohen's *d* is the effect size (0.2=small effect, 0.5=medium effect, 0.8=large effect).

Hypothesis 1b

Sadness VAS and BES Sadness subscale

Hypothesis 1b predicted that HEC participants would have significantly higher levels of sadness, as shown on the Sadness VAS, following the induction of sadness, when

compared with control participants. A one-way ANCOVA showed that when Time 1 Sadness VAS, HADS Anxiety and HADS Depression scores were co-varied out, the main effect of group on Time 2 Sadness VAS was not significant, $F(1,44)=2.68$, $p=.108$. This part of Hypothesis 1b was therefore not supported. The covariate analyses indicated that the Time 1 Sadness VAS did not have a significant statistical effect on the Time 2 Sadness VAS scores, $F(1,44)=3.43$, $p=.072$, nor did the HADS-Depression scores $F(1,44)=1.87$, $p=.179$, or the HADS-Anxiety scores $F(1,44)=1.13$, $p=.293$.

Hypothesis 1b predicted that HEC participants would have significantly higher levels of sadness, as shown on the BES Sadness subscale, following the induction of sadness, when compared with control participants. A one-way ANCOVA showed that when Time 1 BES Sadness subscale scores, HADS Anxiety and HADS Depression scores were co-varied out, the main effect of group on Time 2 BES Sadness was not significant $F(1,44)=.82$, $p=.37$. This part of Hypothesis 1b was therefore not supported. The covariate analyses indicated that the Time 1 BES Sadness subscale did not have a significant statistical effect on the Time 2 BES Sadness scores, $F(1,44)=3.41$, $p=.072$, nor did the HADS-Depression scores $F(1,44)=.002$, $p=.962$. However, the HADS-Anxiety scores did have a significant statistical effect upon the Time 2 BES Sadness results, $F(1,44)=4.05$, $p=.05$. The partial effect size was medium ($\eta^2=.084$).

Hypothesis 2

Disgust Sensitivity Scale

The second hypothesis predicted that the HEC group would have significantly higher levels of disgust (as shown by scores on the DS-R), following the sadness induction, when compared with the control participants. A one-way ANCOVA showed that when Time 1 DS-R scores, HADS Anxiety and HADS Depression scores were co-varied out, the main effect of group on Time 2 DS-R scores was not significant, $F(1,44)=.000$, $p=.993$. This part of Hypothesis 2 was therefore not supported. The covariate analyses indicated that the Time 1 DS-R had a significant statistical effect on the Time 2 DS-R scores, $F(1,44)=267.23$, $p<.001$. The effect size was large ($\eta^2=.859$). HADS-Depression scores also had a significant statistical effect on the DS-

R scores, $F(1,44)=4.9$, $p=.032$. The effect size was large ($\eta^2=.1$), whilst HADS-Anxiety scores did not have a significant statistical effect upon the Time 2 DS-R results, $F(1,44)=2.93$, $p=.094$.

Estimation of body size

A second aim of the second hypothesis predicted that the HEC group would have significantly higher levels of body size estimation (as shown by scores on the Body Shape Silhouettes), following the sadness induction, when compared with the control group. A one-way ANCOVA showed that when Time 1 Body Shape Silhouette scores, HADS Anxiety and HADS Depression scores were co-varied out, the main effect of group on Time 2 Body Shape Silhouette scores was not significant, $F(1,44)=.00$, $p=.996$. This part of Hypothesis 2 was therefore not supported. The covariate analyses indicated that the Time 1 BSS scores had a significant statistical effect on the Time 2 BSS scores, $F(1,44)=323.47$, $p<.001$. The effect size was large ($\eta^2=.880$). HADS-Depression scores had a significant statistical effect on the BSS scores, $F(1,44)=5.87$, $p=.02$. The effect size was large ($\eta^2=.118$). HADS-Anxiety scores also had a significant statistical effect upon the Time 2 BSS results, $F(1,44)=4.91$, $p=.032$. The effect size was large ($\eta^2=.1$).

Self-Disgust Scale

A third aim of the second hypothesis predicted that the HEC group would have significantly higher level of self-disgust (as shown by scores on the Self-Disgust Scale), following the sadness induction, when compared with the control group. A one-way ANCOVA showed that when Time 1 SDS scores, HADS Anxiety and HADS Depression scores were co-varied out, the main effect of group on Time 2 SDS scores was significant, $F(1,44)=9.14$, $p=.004$. The effect size was large ($\eta^2=.172$). Looking at the means for the HEC and control groups Time 1 and Time 2 SDS scores, contrary to the hypothesis, the control groups SDS scores increased from Time 1 (mean=24.26) to Time 2 (mean=25.35), while the HEC groups SDS mean score decreased from Time 1 (mean=48.77) to Time 2 (mean=47.42), thus this part of the hypothesis was not supported. The covariate analyses indicated that the Time 1 SDS scores had a significant statistical effect on the Time 2 SDS scores, $F(1,44)=168.31$, $p<.001$. The effect size was large ($\eta^2=.880$). HADS-Depression scores had a

significant statistical effect on the SDS scores, $F(1,44)=4.92$, $p=.032$. The effect size was large ($\eta^2=.1$). HADS-Anxiety scores also had a significant statistical effect upon the Time 2 SDS results, $F(1,44)=10.97$, $p=.002$. The effect size was large ($\eta^2=.2$).

Hypothesis 3

Emotion Regulation Questionnaire

Hypothesis 3 predicted that HEC participants would have statistically significantly different scores on the Expressive Suppression subscale of the ERQ, when compared with control participants, with the HEC group demonstrating higher mean scores. The mean Expressive Suppression score of the HEC group ($M=15.69$, $SD=5.02$) was significantly higher, $t(47)= 2.63$, two-tailed $p= .011$, than that of the LEC group ($M=11.87$, $SD=5.12$). This part of Hypothesis 3 was therefore supported.

The second part of Hypothesis 3 predicated that HEC participants would have statistically significantly different scores on the Cognitive Re-appraisal subscale of the ERQ, when compared with control participants, with the HEC group demonstrating lower mean scores. The mean Cognitive Re-appraisal subscale score of the HEC group ($M=25.61$, $SD=6.71$) was significantly lower, $t(47)=-2.55$, two tailed $p= .014$, than that of the LEC group ($M=30.30$, $SD=6.06$). This part of Hypothesis 3 was also supported.

Exploratory analysis

DERS

The results of the between groups Independent t-tests on the DERS subscale scores are presented in Table 6. The HEC group had significantly higher scores (indicating more difficulties) on: non-acceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, limited access to emotional regulation strategies, lack of emotional clarity and total DERS scores. ‘Lack of emotional awareness’ just failed to reach significance.

Table 6: Means, standard deviations, t-values, probability levels and effect sizes for group comparison on the Difficulties in Emotion Regulation Questionnaire subscales.

| DERS Subscales | HEC group (SD) N=26 | LEC group (SD) N=23 | t-value | Prob. levels | Cohen's <i>d</i> |
|-----------------------|----------------------------|----------------------------|----------------|---------------------|-------------------------|
| Nonaccept | 17.89 (7.15) | 12.17 (5.73) | 3.06 | <.005* | 0.88 |
| Goals | 19.34 (4.79) | 15.3 (5.22) | 2.85 | <.006* | 0.81 |
| Impulse | 14.3 (5.63) | 10.3 (4.22) | 2.79 | ≤.008* | 0.41 |
| Awareness | 17.11 (4.9) | 13.78 (4.54) | 2.46 | <.018 | 0.71 |
| Strategies | 23.42 (8.58) | 14.09 (4.8) | 4.61 | <.001* | 1.39 |
| Clarity | 16.31 (5.11) | 9.57 (3.3) | 5.4 | <.001* | 1.6 |
| Total | 108.42 (26.31) | 75.21 (20.73) | 4.86 | <.001* | 1.41 |

*Denotes significance at the 0.008 level. Cohen's *d* is the effect size (0.2=small effect, 0.5=medium effect, 0.8=large effect).

DISCUSSION

The results of the study did not support Hypothesis 1b and 2, the main study hypotheses. In relation to Hypothesis 1b, the study failed to find a statistically significant difference in the HEC groups sadness scores at Time 2, compared to the control group, when Time 1 sadness and HADS scores were controlled for. Hypothesis 1a was supported, demonstrating that all participants' sadness scores were significantly higher at Time 2 compared to Time 1, indicating that the sad mood induction appeared successful. In relation to Hypothesis 2, the study did not find evidence that the HEC groups disgust or body size estimation scores increased significantly at Time 2, compared to the control group, when Time 1 measures and HADS scores were controlled for. There was a significant effect of group on Time 2 SDS scores, when Time 1 SDS measures and HADS scores were controlled for, however, looking at the group means, the results were contrary to the expected findings as the control groups SDS scores increased while the HEC mean SDS scores decreased. Hypothesis 3, a secondary study hypothesis, was supported by the results. The HEC group was found to have significantly higher levels of expressive suppression, and significantly lower levels of cognitive re-appraisal emotion regulation strategies.

The results of the study failed to find evidence of an 'emotion coupling' effect between sadness and disgust/self-disgust, or a possible relation to body size estimation, in an analogue sample. This was the first time a possible emotion coupling effect between sadness and disgust/self-disgust had been investigated, based on the hypothesised relationship between these two emotions, as discussed in the SPAARS-ED model (Fox & Power, 2009). Previous research based on the SPAARS-ED model (Fox & Power, 2009) found an emotion coupling effect between anger and disgust in analogue (Fox & Harrison, 2008) and AN samples; in addition, this research found a relation to increased body size estimation (Fox et al. 2013).

There are several possible reasons why a relationship between sadness and disgust/self-disgust was not found. No coupling effect may exist between sadness and disgust/self-disgust. Alternatively, a sadness/disgust emotion coupling effect may not be apparent in non-clinical populations. It has been suggested that anger may be the more important emotion in EDs, and that sadness may play a lesser role (Fox, 2009). Perhaps if a coupling effect between sadness and disgust exists, it is not as strong an

effect compared to anger and disgust, and is therefore less likely to be found in non-clinical populations.

The finding that the control groups self-disgust scores increased while the HEC groups scores decreased was unexpected, and it will be treated cautiously. This finding may reflect regression to the mean effects, the tendency for very high or very low scores to fall closer to the mean on repeat testing.

Within the study, sadness did not have any relation to body size estimation. This is contrary to previous experimental research demonstrating a causal link between sad mood and increased body size estimation, in both clinical, analogue and healthy control samples. For example, in a non-clinical sample, Plies & Florin (1992) found that following a sad MIP, body width estimates (as measured using a distorting video images technique) increased in both restrained and unrestrained eaters, when compared to baseline estimates. In addition, Haedt-Matt, Zalta, Forbush & Keel (2012) found that a sadness MIP led to increased dissatisfaction with weight and shape in healthy controls compared to those in a neutral MIP. These studies indicate that sad mood can lead to changes in body width/satisfaction, in non-clinical samples. However, methodological weaknesses within these studies may compromise the validity of the results. For example, Plies & Florin (1992) did not control for depression, despite discussing that depression correlates highly with elevated body size estimations. While within Haedt-Matt et al. (2012), participants were somewhat aware of the study purpose (i.e., to investigate body image), and were instructed to “get into a sad mood,” therefore creating potential study demand effects.

Other studies have failed to demonstrate an effect of sad mood on body size estimates in control groups, exclusively finding evidence of an effect in clinical (BN) samples (Kulbartz-Klatt et al., 1999). Thus, studies have not conclusively shown that a sad mood leads to an increase in body size estimation/dissatisfaction in non-clinical samples.

One factor that may have influenced the results was the type of body image outcome measure used. The present study asked participants to indicate ‘how they looked right now’ using a set of increasingly larger body shape silhouettes. While studies have found increases in body width following a sadness MIP using a similar set of instructions (Kubartz-Klatt et al., 1999), others have also asked participants to estimate how wide their body ‘felt’ (Huon & Brown, 1986) or ‘sensed’ (Franzen, Florin, Schneider & Meier, 1988; Thompson & Dolce, 1989; Plies & Florin, 1992).

These latter studies found that when non-clinical and clinical ED samples were asked to indicate their sensed body width, they gave higher estimations than when asked to indicate their actual body width. It may be that measures which take into account actual and sensed body estimates would be more relevant in future research.

Study Limitations

The study has a number of limitations. As previously mentioned, a non-clinical sample was used. While the analogue participants had EDE-Q scores indicating clinical caseness (Mond et al., 2004), this is no substitute for participants with confirmed diagnosed EDs, and could potentially be a reason for the rejection of the main study hypotheses.

Another important study limitation relates to the sadness MIP. The study attempted to ensure only a sad mood was elicited, and choose validated MIP techniques i.e., previously shown to induce a predominantly sad mood, (film and music clips). Nevertheless, the independent assessment of the modified Velten (1968) technique indicated participant autobiographical events could have elicited emotions other than sadness in half of the total sample. However, the study found evidence that sadness was the predominant emotion induced; looking at the results of the Basic Emotions Scale, sadness ratings were shown to increase significantly for both groups from Time 1 to Time 2, while no other significant changes were shown in the other emotion subscales. The Fear subscale was the highest rated emotion at Time 1 and Time 2 for the HEC group, the lack of change over time-points may indicate this is a “trait” characteristic, and may relate to the HADS-Anxiety scores, which were in the clinically significant range. However, the mean BES scores for the LEC group indicated that Happiness was rated higher than Sadness at Time 2, despite scores decreasing significantly from Time 1 measures. Authors have discussed that it is possible to induce one emotion to a greater intensity than another emotion, but it may never be possible to induce *only* one emotion (Gross & Levenson, 1995). These findings highlight potential difficulties for future research in EDs using a basic emotions perspective, where the purity of emotion induction is more important than when using a dimensional approach to emotion (e.g., negative affect). In addition, ten participants indicated that their level of sadness did not change on the VAS from Time 1 to Time 2, and in two cases sadness levels decreased. This indicates that the sadness MIP was not effective for some participants, and underscores the wider issue

of individual differences in response to affective stimuli in MIP methods. The aforementioned participants were kept in the study analyses for two reasons, these scores might be expected within a normal distribution of results. In addition, according to the SPAARS-ED model, unacceptable emotions (e.g., sadness) may be suppressed, which may explain a lack of change in some participant results.

The Body Shape Silhouettes (BSS) scale presents another study limitation. The silhouettes were presented to participants as a whole, in incremental order, instead of on individual cards given in random order, as used in the original measure (Williamson et al., 2000). This may have influenced Time 2 BSS scores as participants might remember which silhouette they indicated previously (Gardner, Friedman & Jackson, 1998); this could affect finding changes in body size pre- and post-sad mood induction. In addition, the first two silhouettes and two silhouettes in the middle of the scale were removed to enable the silhouettes to be presented on one page. Consequently, this created some discontinuity in the scale and may have restricted participants choosing a body silhouette that was closest to their perceived size. The study also only analysed the first part of the BSS, in which participants indicate their perceived size, but did not analyse the second part, which enquires about ideal size. The discrepancy between actual and ideal size has been validated as a measure of dissatisfaction with body size (Williamson, Gleaves, Watkins & Schlundt, 1993) and may provide a fruitful additional variable to investigate.

Another study limitation relates to demand effects in the measurement of mood, for example, using a single Sadness Visual Analogue Scale. This factor and the use of repeat measures may highlight important study variables to participants. The study also exclusively used self-report measures. Future studies would benefit from the use of subjective and objective measures, especially in a population that may have difficulties with alexithymia, which refers to the inability to identify and describe emotional states (e.g., Bydlowski et al., 2005). The study found higher rates of emotion suppression on the ERQ, and emotion regulation difficulties on the DERS, e.g., lack of emotional clarity, both of which may affect self-report measures and the results.⁴⁴

The generalisability of the findings may be limited by the study sample, which consisted predominantly of University students, many of whom gained credits for

⁴⁴ See paper 3, p. 107

their participation for their Psychology Undergraduate course. Due to the strict screening process, only 15.15% of participants took part in the second stage of the study, from the initial 363 responders to the survey.

Conclusions and Future research

The study failed to find a relationship between sadness, disgust/self-disgust, and body size estimation in a sample of participants with high eating concerns. Future research may benefit from conducting a similar study with an ED sample, to investigate whether the proposed sadness/disgust emotion coupling effect exists within this population. Prospective research should pay particular consideration to the methodology of the sadness MIP, i.e., the validity of the MIP, the assessment of mood (e.g., measuring a range of emotions), the use of objective and subjective measures, demand effects that may be associated with the research (e.g., mood measures, MIP instructions), as previous research has been confounded by some of these issues. Future research investigating the role of sadness in EDs would be clinically relevant, in order to increase understanding of which emotions might be particularly problematic for people with EDs. Research has suggested that anger is a difficult emotion for people with EDs (Geller et al., 2000; Waller et al., 2003; Fox & Harrison, 2008; Fox et al., 2013), further clarification of the role of sadness in EDs would be useful to help inform the formulation and treatment of emotion difficulties within EDs.

REFERENCES

- Bjelland, I., Dahl, A.A., Haug, T.T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: An updated literature review. *Journal of Psychometric Research, 52*(2), 69–77. DOI: 10.1016/S0022-3999(01)00296-3
- Brockmeyer., T., Holtforth, M.G., Bents, H., Kämmerer, A., Herzog, W., & Friederich, H.C. (2012). Starvation and emotion regulation in anorexia nervosa. *Comprehensive Psychiatry, 53*(5), 496–501. DOI: 10.1016/j.comppsy.2011.09.003
- Bydlowski, S., Corcos, M., Jeammet, P., Paterniti, S., Berthoz, S., Laurier, C.,...Consoli, S.M. (2005). Emotion-Processing Deficits in Eating Disorders. *International Journal of Eating Disorders, 37*, 321–329. DOI: 10.1002/eat.20132
- Clark-Carter, D. (2004). *Quantitative Psychological Research: A Student's Handbook*. Hove and New York: Psychology Press. Taylor and Francis Group.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences* (2nd edition). Hillsdale, NJ: Erlbaum.
- Cooper, P.J., Taylor, M.J., Cooper, Z. & Fairburn, C.G. (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
- Davey, G.C.L., Buckland, G., Tantow, B., & Dallos, R. (1998). Disgust and Eating Disorders. *European Eating Disorders Review, 6*, 201-211. DOI: 10.1002/(SICI)1099-0968(199809)6:3<201::AID-ERV224>3.0.CO;2-E
- Davey, G.C.L., & Chapman, L. (2009). Disgust and Eating Disorder Symptomatology in a Non-Clinical Population: The Role of Trait Anxiety and Anxiety Sensitivity. *Clinical Psychology and Psychotherapy, 16*, 268-275. DOI: 10.1002/cpp.623
- Ekman, P. (1982). (Ed.) *Emotion in the human face* (2nd ed.). Cambridge, UK: Cambridge

University Press.

- Espeset, E.M.S., Gulliksen, K.S., Nordbø, R.H.S., Skårderud, F., & Holte, A. (2012). The Link Between Negative Emotions and Eating Disorder Behaviour in Patients with Anorexia Nervosa. *European Eating Disorders Review*, 20, 451-460. DOI: 10.1002/erv.2183
- Fairburn, C.G., & Beglin, S.J. (1994). Assessment of Eating Disorders: Interview or Self-Report Questionnaire? *International Journal of Eating Disorders*, 16, 363–370. DOI: 10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#
- Fairburn, C.G., Cooper, Z., Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a “transdiagnostic” theory and treatment. *Behaviour Research and Therapy*, 41(5), 509-528. DOI: 10.1016/S0005-7967(02)00088-8
- Fox, J.R.E. (2009). A Qualitative Exploration of the Perception of Emotions in Anorexia Nervosa: A Basic Emotion and Developmental Perspective. *Clinical Psychology and Psychotherapy*, 16(4), 276–302. DOI:10.1002/cpp.631
- Fox, J.R.E., Federici, A., & Power, M.J. (2012). Emotions and Eating Disorders. In J. R.E Fox, & K. Goss (Eds.), *Eating and its Disorders* (pp. 167-197). Chichester, West Sussex: Wiley-Blackwell.
- Fox, J.R.E., & Froom, K. (2009). Eating disorders: A Basic Emotions Perspective. *Clinical Psychology and Psychotherapy*, 16(4), 328-336. DOI: 10.1002/cpp.622
- Fox, J.R.E., Grange, N., & Power, P. (2014). Self-Disgust in Eating Disorders: A Review of the Literature and Clinical Implications. In Philip A. Powell, Paul G. Overton & Jane Simpson (Eds.), *The Revolting Self: Perspectives on the Psychological, Social, and Clinical Implications of Self-Directed Disgust*. Karnac Publishers.
- Fox, J.R.E., & Harrison, A. (2008). The Relation of Anger to Disgust: The Potential Role of Coupled Emotions within Eating Pathology. *Clinical*

Psychology and Psychotherapy, 15(2), 86–95. DOI: 10.1002/cpp.565

Fox, J.R.E., & Power, M.J. (2009). Eating Disorders and Multi-Level Models of Emotion: An Integrated Model. *Clinical Psychology and Psychotherapy*, 16(4), 240-267.

DOI:10.1002/cpp.626

Fox, J.R.E., Smithson, E., Baillie, S., Ferreira, N., Mayr, I. & Power, M.J. (2013). Emotion Coupling and Regulation in Anorexia Nervosa. *Clinical Psychology and Psychotherapy*, 20, 319-333. DOI: 10.1002/cpp.1823

DOI: 10.1002/cpp.1823

Franzen, U., Florin, I., Schneider, S., & Meier, M. (1988). Distorted body image in bulimic women. *Journal of Psychosomatic Research*, 32,445-450. DOI: 10.1016/0022-

3999(88)90028-1

Gardner, R.M., Friedman, B.N. & Jackson, N.A. (1998). Methodological concerns when using silhouettes to measure body image. *Perceptual and Motor Skills*, 86, 387-395.

DOI: 10.2466/pms.1998.86.2.387

Garner, D. (2002). Measurement of Eating Disorder Psychopathology. In C.G. Fairburn, & K.D. Brownell (Eds.), *Eating disorders and Obesity: A Comprehensive Handbook*, (2nd Ed.) (pp. 141–146). New York: Guilford Press.

Geller, J., Cockell, S.J., Hewitt, P.L., Goldner, E.M., & Flett, G.L. (2000). Inhibited Expression of Negative Emotions and Interpersonal Orientation in Anorexia Nervosa.

International Journal of Eating Disorders, 28(1), 8–19. DOI: 10.1002/1098-

108X(200007)28:13.0.CO;2-U

Gratz, K.L. & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the

Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26(1), 41-54. DOI: 10.1007/s10862-008-9102-4

DOI: 10.1007/s10862-008-9102-4

- Gross, J.J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology*, 2(3), 271-299. DOI: 10.1037/1089-2680.2.3.271
- Gross, J.J., & John, O.P. (2003). Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-Being. *Journal of Personality and Social Psychology*, 85, (2), 348-362. DOI: 10.1037/0022-3514.85.2.348
- Gross, J.J., & Levenson, R.W. (1995). Emotion Elicitation Using Films. *Cognition and Emotion*, 9(1), 87-108. DOI: 10.1080/02699939508408966
- Haedt-Matt, A.A., Zalta, A.K., Forbush, K.T., & Keel, P.K. (2012). Experimental evidence that changes in mood cause changes in dissatisfaction among undergraduate women. *Body Image*, 9, 216-220. DOI: 10.1016/j.bodyim.2011.11.004
- Hatch, A., Madden, S., Kohn, M., Clarke, S., Touyz, S., & Williams, L.M. (2010). Anorexia Nervosa: Towards An Integrative Neuroscience Model. *European Eating Disorders Review*, 18, 165–179. DOI: 10.1002/erv.974
- Haynos, A.F., & Fruzzetti, A.E. (2011). Anorexia Nervosa as a Disorder of Emotion Dysregulation: Evidence and Treatment Implications. *Clinical Psychology: Science and Practice*, 18, 183–202. DOI: 10.1111/j.1468-2850.2011.01250.x
- Hewig, J., Hagemann, D., Seifert, J., Gollwitzer, M., Naumann, E., & Bartussek, D. (2005). A revised film set for the induction of basic emotions. *Cognition and Emotion*, 19(7), 1095-1109. DOI: 10.1080/02699930541000084
- Huon.G. F., & Brown. L. B. (1986). Body Images in Anorexia Nervosa and Bulimia Nervosa. *Journal of Eating Disorders*, 5, 421-439.
DOI: 10.1002/1098108X(198603)5:3<421::AID-EAT2260050303>3.0.CO;2-S
- Ioannou, K., & Fox, J.R.E. (2009). Perception of Threat from Emotions and its Role in Poor Emotional Expression within Eating Pathology. *Clinical Psychology and*

Psychotherapy, 16(4), 336–347. DOI: 10.1002/cpp.632

Izard, C.E. (1971). *The face of emotion*. New York: Appleton-Century-Crofts.

Kulbartz-Klatt, Y.J., Florin, I. & Pook, M. (1999). Bulimia nervosa: Mood changes do have an impact on body width estimation. *British Journal of Clinical Psychology*, 38, 279-287. DOI: 10.1348/014466599162854

Lustig, C., & Hasher, L. (2001). Implicit Memory Is Not Immune to Interference. *Psychological Bulletin*, 127(5), 618–628. DOI: 10/1037//0033-2909.127.5.629

Miller, W.I. (1997). *The Anatomy of Disgust*. Cambridge, MA: Harvard University Press.

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

Oatley, K., & Johnson-Laird, P.N. (1987). Towards a Cognitive Theory of Emotions. *Cognition and Emotion*, 1, 29–50. DOI: 10.1080/02699938708408362

Olatunji, B.O., Tolin, D.F., Sawchuck, C.N., Williams, N.L., Abramowitz, J.S., Lohr, J.M., & Elwood, L.S. (2007). The Disgust Scale: Item Analysis, Factor Structure, and Suggestions for Refinement. *Psychological Assessment*, 19(3), 281–297. DOI: 10.1037/1040-3590.19.3.281

Overton, P.G., Markland, F.E., Taggart, H.S., Bagshaw, G.L., & Simpson, J. (2008). Disgust Mediates the Relationship Between Dysfunctional Cognitions and Depressive Symptomatology. *Emotion*, 8(3), 379-385. DOI: 10.1037/1528-3542.8.3.379

Peterson, C.B., Crosby, R.D., Wonderlich, S.A., Joiner, T., Crow, S.J., Mitchell, J.E., Bardone-Cone, A.M., Klein, M., & Le Grange, D. (2007). Psychometric properties of the Eating Disorder Examination-Questionnaire: Factor structure and internal consistency. *International Journal of Eating Disorders*, 40, 386–389.

DOI: 10.1002/eat.20373

Plies, I., & Florin, K. (1992). Effects of Negative Mood Induction on the Body Image of Restrained Eaters. *Psychology and Health*, 7, 235–242. DOI: 10.1080/08870449208520024

Power, M.J. (2006). The structure of emotion: An empirical comparison of six model. *Cognition and Emotion*, 20(5), 694-713. DOI:10.1080/02699930500367925

Power, M., & Dalgleish, T. (1997). *Cognition and emotion: From order to disorder*. Hove, UK: Psychology Press, Taylor and Francis Group.

Rotenberg, K.J., Taylor, D., & Davis, R. (2004). Selective Mood-Induced Body Image Disparagement and Enhancement Effects: Are They Due to Cognitive Priming or Subjecting Mood? *International Journal of Eating Disorders*, 35(3), 317-332. DOI: 10.1002/eat.10263

Taylor, M.J. & Cooper, P.J. (1992). An Experimental Study of the Effect of Mood on Body Size Perception. *Behaviour Research and Therapy*, 30(1), 53-58. DOI: 10.1016/0005-7967(92)90096-Y

Thompson, J.K., & Dolce, J. J. (1989). The Discrepancy Between Emotional vs. Rational Estimates on Body Size, Actual Size and Ideal Body Ratings: Theoretical and Clinical Implications. *Journal of Clinical Psychology*, 45, 473-478. DOI: 10.1002/1097-4679(198905)45:3<473::AID-JCLP2270450320>3.0.CO;2-0

Trambakoulos, J. (1997). *The Endorsement of Dysfunctional Attitudes Following a Negative Mood Induction in Vulnerable Individuals*. Unpublished manuscript, Psychology Department, University of York. In Daniel Västfjäll. (2002). Emotion induction through music: a review of the musical mood induction procedure. *Musicae Scientiae*, 5(1), 173-211. DOI: 10.1177/10298649020050S107

Treasure, J., Corfield, F., & Cardi, V. (2012). A Three-phase Model of the Social Emotional Functioning in Eating Disorders. *European Eating Disorders Review*, 20, 431-438.

DOI:10.1002/erv.2181

Troop, N.A., Treasure, J., & Serpell, L. (2002). A Further Exploration of Disgust in Eating Disorders. *European Eating Disorders Review*, *10*, 218-226. DOI: 10.1002/erv.444

Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology*, *45*, 343–366.

DOI: 10.1348/014466505X53902

Snaith, R.P. (2003). The Hospital Anxiety and Depression Scale. *Health and Quality of Life Outcomes*, *1*(29). DOI:10.1186/1477-7525-1-29

Spaaren, D.L., Waters, F., Brummer, L., Stopa, L. & Bucks, R.S. (2014). The Emotion Regulation Questionnaire: Validation of the ERQ-9 in Two Community Samples. *Psychological Assessment*, *26*(1), 46-54. DOI: 10.1037/a0034474.

Velten, E. (1968). A Laboratory Task for Induction of Mood States. *Behaviour Research and Therapy*, *6*, 473–482. DOI:10.1016/0005-7967(68)90028-4

Waller, G., Babbs, M., Milligan, R.J., Meyer, C., Ohanian, V. & Leung, N. (2003). Anger and Core Beliefs in the Eating Disorders. *International Journal of Eating Disorders*, *34* (1), 118–124. DOI: 10.1002/eat.10163

Wechsler, D. (2010). *Wechsler Adult Intelligence Scale-Fourth UK Edition*. London: Pearson.

Wildes, J.E., Marcus, M.D., Bright, A.C., & Dapelo, M.M. (2012). Emotion and Eating Disorder Symptoms in Patients with Anorexia Nervosa: An Experimental Study. *International Journal of Eating Disorders*, *45*, 876-882. DOI: 10.1002/eat.22020

Williamson, D.A., Gleaves, D.H., Watkins, P.C. & Schlundt, D.G. (1993). Validation of self-ideal body size discrepancy as a measure of body dissatisfaction. *Journal of*

Psychopathology and Behavioral Assessment, 15, 57-68. DOI: 10.1007/BF00964324

Williamson, D.A., Womble, L.G., Zucker, N.L., Reas, D.L., White, M.A., Blouin, D.C. & Greenway, F. (2000). Body image assessment for obesity (BIA-O): development of a new procedure. *International Journal of Obesity*, 24, 1326-1332. DOI: 10.1038/sj.ijo.0801363

Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, 67, 361–370. DOI: 10.1111/j.1600-0447.1983.tb09716.x

Paper Three

Critical appraisal and personal reflections

Word count: 5699

Introduction

This paper aims to present a critical and personal reflective account of the process of conducting two distinct, but related, research studies. The paper will first discuss the process of conducting a systematic review of the literature, while the latter section will be devoted to the course of the experimental research study. The paper will include discussion of the strengths and weaknesses of the research, and its contributions to and implications for theory and practice.

In Paper One, a systematic review of mood induction procedures (MIPs) in body image research was conducted. Specifically, the methodology of MIPs was critically examined, as well as key findings from studies using MIPs in body image research. Fifteen papers were reviewed; the results suggested that the quality of most papers was moderate. In addition, a number of methodological weaknesses pertaining to the study MIPs were identified, e.g., lack of validated MIP methods, demand characteristics. In relation to the study findings, there was evidence of an effect of ‘negative mood’ on different aspects of body image; however, MIP methodological issues may confound the validity of these results. Based on the review findings, recommendations were made for future studies using MIPs in body image research.

Paper Two sought to investigate a potential ‘emotion coupling’ effect between sadness, disgust/self-disgust and a relation to body size estimation in a sample of participants with high eating concerns. The research was based on Fox & Power’s (2009) Schematic, Propositional, Analogical and Associative Representation Systems in Eating Disorders (SPAARS-ED) model, which proposes that emotion regulation difficulties are central to the development and maintenance of eating disorders (EDs), and suggests that certain emotions (e.g., anger, sadness) are problematic. Results did not show evidence of an emotion coupling effect between sadness and disgust/self-disgust in an analogue sample when compared to healthy controls. The study did find evidence of increased emotion suppression strategies, and decreased cognitive re-appraisal strategies in the analogue sample, compared to controls, indicating less helpful emotion regulation processes in the former group.

Paper One: Methodological limitations of mood induction procedures in body image research: A systematic review

Rationale for topic

Mood induction procedures (MIPs) are an important method for experimental induction of mood in the laboratory. They have become important in studies investigating relationships between emotion, cognition and behaviour (Westermann, Spies, Stahl & Hesse, 1996). The use of an MIP was central to the empirical study in Paper Two, however, the effectiveness and the validity of the method has been questioned in the wider literature (Brenner, 2000; Buchwald, Strack & Coyne, 1981; Martin, 1990; Westermann et al., 1996). These methodological issues are a concern in relation to the growing interest in emotion regulation difficulties in eating disorders (EDs). MIPs are potentially one of the only laboratory methods for investigating causal relationships between mood and eating disorder cognitions and behaviours. Therefore it is essential to have valid and reliable methods in order for research on emotion difficulties to develop. It was against this backdrop that a review of the methodological limitations of MIPs in EDs was conceptualised. It was envisioned that a review would provide information on the validity and reliability of research within EDs using MIPs, and offer recommendations for improvements within the literature area.

Rationale for conducting a systematic review

It was decided that a systematic review would be most appropriate for a review of the extant literature. Systematic reviews are considered the ‘gold standard’ method for synthesising the findings of several studies investigating the same question or problem (Dickson, Cherry & Boland, 2014). In addition, the use of pre-defined eligibility criteria, systematic searching of relevant literature, assessment of the validity of findings and synthesis of results would be useful when approaching the review question (Popovich et al., 2012).

Topic refinement and search term strategy

Initial searches of the literature were conducted in order to facilitate topic refinement. A number of studies were identified which had used MIPs in various aspects of eating disorder research, particularly within body image and eating behaviour (e.g., where

outcome measures consisted of the amount of food eaten following an MIP). It was felt that the topic area needed to be specific in order for the review to be manageable. Consequently, due to Paper Two's focus on the effect of mood on body size estimation, it was decided to focus on the cognitive aspects of mood on eating disorder symptoms (e.g., body size estimation, concerns about weight/shape, 'feeling fat'). No previous reviews within this area were found, which was surprising, but it may reflect the developing research area. This was considered a good opportunity to highlight the validity of MIPs within empirical research on body image, and consequently fill a gap within the literature.

Choosing appropriate search terms took a considerable amount of time. A number of combinations were experimented with, which produced either very large or very small search results, indicating search terms that were too broad or too specific. Consequently the search terms decided upon were felt to be the best compromise, and while the terms produced a number of irrelevant returns, they increased the chance that no relevant studies were overlooked.

Review procedure

The use of pre-established inclusion criteria was a guiding light for the review process. It was frequently referred to and greatly helped with decision-making processes. It was helpful for the type of MIPs that would be included, for example, it was decided to exclude studies that did not use an identifiable mood induction (e.g., body dissatisfaction), unless a valid MIP was also included within the study (e.g., sadness). It was interesting to reflect on the cognitive and emotional processes that might underlie 'body dissatisfaction,' as this would most likely impact upon mood. Nevertheless, despite the inclusion criteria, a few studies were included in the review that were difficult to assimilate within the second review question, i.e., the key findings emerging from body image studies using MIPs, as some key results related to non-MIP inductions. It was useful to reflect on this aspect of the review process, and whether stricter inclusion criteria should have been used, however, this has the drawback of decreasing the number of papers to review. As evaluation of the MIP method was the main aim of the review, and discussion of key findings a secondary aim, it was felt that the inclusion criteria were sufficient.

Quality assessment rating tool

Quality assessment tools are a key part of systematic reviews, ensuring that the conclusions made in the review as a whole are based on high quality studies. Specifically, ‘quality’ refers to the degree with which a study employs measures to minimise bias and error in its design, conduct and analysis (Khan, Kunz, Kleijnen & Antes, 2003). The difficulty in choosing a suitable quality rating tool quickly became apparent during initial searches; a heavy focus on tools for Randomised Controlled Trials was noted. It was consequently decided to use the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies (EPHPP, 1998), which incorporated questions pertinent to experimental study design.

One of the main challenges of conducting the review was how to evaluate the methodological limitations of MIPs in a clear and transparent manner. This process began with understanding features associated with robust experimental design and factors related to internal/external validity, with authors such as Campbell & Stanley (1963) being helpful in this regard. In addition, previous reviews of MIPs and their limitations were researched (Brenner, 2000; Buchwald et al., 1981; Martin, 1990; Westermann et al., 1996;). Due to the overlap between the quality assessment of the review studies, and the reviews’ first aim i.e., to assess MIP method, a decision was taken to combine these two aspects into one quality assessment tool. A bespoke tool was created based on the EPHPP quality assessment tool and limiting factors associated with MIPs as listed in Martin (1990) and Brenner (2000).

There were a few limitations to this bespoke tool. Firstly the scoring system was pragmatic; the total number of attainable points was divided into three sections, in order to dictate the strength of the study quality: ‘strong,’ ‘moderate’ and ‘weak.’ Consequently, some aspects of the tool may be scored differently if the original scoring criteria from the EPHPP tool was used. There is also bias within the tool as items related to the MIP method were selected by the researcher; however, they were grounded within the literature (e.g., Brenner, 2000; Martin, 1990; Westermann et al., 1996). In addition, there was a bias towards studies that used a basic emotions approach to MIPs, nevertheless, this bias was highlighted within the paper and a rationale for this approach was provided. The tool was also vulnerable to subjective interpretation, for example, assessing how ecologically valid an MIP appeared, however, this was declared at the outset, and largely based on the wider literature (e.g., Fox et al., 2013; Gross & Levenson, 1995).

Reflections on the review process

Conducting the systematic review was both a challenging undertaking and a valuable learning experience. The review was difficult to conduct alongside recruitment and testing for the quantitative study in Paper Two, as well as academic and clinical work within the Clinical Psychology Doctorate. Nevertheless, conducting a review with a particular focus on methodology was extremely useful for refining skills in evaluating research papers, e.g., study design, factors related to internal and external validity. These skills as well as the experience of conducting a systematic review will no doubt be extremely useful for future clinical practice, in terms of evaluating existing research, informing evidence-based practice, contributing to future research development both personally and within teams and services.

Implications of review findings

To my knowledge, this is the first time a review of MIPs in body image research has been conducted. This is considered a strength of the review as it fills a gap within the literature. The review has highlighted methodological limitations within the existing literature and the potential impact on the validity of study results. This is an important point as the literature area is relatively small (i.e., fifteen relevant studies were reviewed) and most papers were of moderate quality, indicating that caution needs to be taken when using the research base. Another study strength concerns the provision of recommendations on study design and MIP methodology for future research using MIPs in the area of body image research, which may also be applicable to the wider literature using MIPs.

With regards to theory, the review is in line with other reviews of MIPs in the general literature, which have highlighted similar methodological issues within MIPs. In relation to the exploration of mood within body image, there is cautious support for theories suggesting the importance of emotion and emotion regulation difficulties within eating disorders (Fox & Power, 2009; Hatch et al., 2010; Haynos & Fruzzetti, 2011). However, the review highlights that methodological limitations within the studies pose a threat to evidencing theoretical underpinnings of emotion difficulties within EDs.

In relation to clinical practice, while caution is urged, the review suggests that negative emotions and emotion regulation difficulties may be an important target for formulation and treatment intervention.

In terms of future research, the review has provided recommendations for the improvement of MIPs in body image research. It encourages future research to consider these issues in order to develop the validity and reliability of the research base.

Paper 2: Empirical Paper: The Relation of Sadness to Disgust: The Potential Role of Coupled Emotions within Eating Behaviour.

Study rationale

Emotion regulation has become an important focus for research exploring the development and maintenance of EDs (e.g., Hatch et al., 2010; Haynos & Fruzzetti, 2011). One theoretical model that provides an understanding of the underlying emotion difficulties and how this manifests itself as an ED, is the Schematic, Propositional, Analogical and Associative Representation Systems in Eating Disorders (SPAARS-ED) model (Fox & Power, 2009). Central to the SPAARS-ED model is the idea of ‘emotion coupling;’ Fox & Power (2009) propose that two or more basic emotions can become coupled based on a persons learning history. Research has found evidence to support a coupling effect between anger and disgust (Fox & Harrison, 2008; Fox et al., 2013), and a relation to increased body size (Fox et al., 2013). While a similar relationship between sadness and disgust had been proposed, and supported by some qualitative research (e.g., Espeset, Gulliksen, Nordbø, Skårderud & Holte, 2012), it had not been empirically tested. It was against this backdrop that the present study aimed to fill a gap in the literature and experimentally test the proposed relationship between sadness and disgust.

It was also envisioned that this research could be clinically useful in order to further our understanding of which emotions might be problematic in EDs, and thus eventually become a target for formulation and treatment intervention.

On a personal level, the choice of topic was appealing in order to learn more about potential emotion regulation processes in EDs, and the intriguing idea of ‘emotion coupling,’ as an emotion regulation strategy. In addition, it was also an opportunity to learn more about emotion regulation processes in general, as they have been noted as a key factor in mental health difficulties (Gross, 2002; Kring, 2008).

Recruitment

It was envisioned that recruitment would present some challenges. Previous studies suggested that to reach a sample size of twenty-five participants in the high eating concern (HEC) group and twenty-five participants in the low eating concern (LEC) group, between three- to four-hundred individuals would need to be screened (Fox & Harrison, 2008). Guided by this, it was decided to recruit from study advertisements placed around the University campus, as well as through a psychology undergraduate research credit system, in which students need to participate in a number of University research studies to fulfill course requirements. With this in mind, the study aimed to start recruitment and testing as soon as possible, and to coincide with the new University calendar year, whereby potential participants might have more spare time, and were looking to gain research credits for their course.

The study received a good initial response, however, despite this a decision was made to reduce the inclusion criteria for the HEC group from an Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) global score of ≥ 4 to ≥ 3.09 , due to the small number of participants meeting this stricter inclusion criteria, and due to time constraints on finishing the study within the limits of the Clinical Psychology Doctorate. It was envisioned that this change to the inclusion criteria would affect the chances of finding an ‘emotion coupling’ effect within the analogue sample, as higher levels on the EDE-Q indicate more severe eating difficulties, and might more closely resemble a clinical ED population, for which the coupling effect is proposed. The present study based its lower inclusion criteria on Mond et al. (2004), which found that scores of ≥ 3.09 on the EDE-Q indicated clinical caseness in a community-dwelling sample. It was felt that while not ideal, this inclusion criteria would be sufficient for the analogue sample.

This difficulty in recruitment highlighted the challenges of finding individuals with high eating concerns, in a relatively short period of time. On reflection, it may have been worth widening the recruitment field to other faculties within the University, i.e., through school-specific email newsletters, or by advertising the study at nearby Universities.

Participants

The study was limited by the use of an analogue sample, as the hypothesised ‘emotion coupling’ effect has been proposed within eating disorder populations. However, the

decision to use an analogue sample was similar to Fox & Harrison (2008) who initially investigated the relationship between anger and disgust with a student analogue population, and following evidence of an emotional coupling effect between anger and disgust, the study was replicated with an Anorexia Nervosa (AN) sample. It was envisioned that research would eventually explore an emotion coupling effect between sadness and disgust in an ED population.

It was recognised that the study sample, which was comprised of university students, particularly psychology undergraduates, would prevent generalisability of the study findings. This issue has been noted as a limitation within the field of psychology in general (Henrich, Heine & Norenzayan, 2010; Witt, Donnellan & Orlando, 2011). While the majority of the sample was White British, over a quarter of participants were from Western and Eastern Europe, North and South America and Asia, providing some ethnic diversity and increased generalisability of the study findings.

Power

It is important to consider whether the study lacked sufficient power to detect a relationship between sadness and disgust. Due to the exclusion of six participants from the study analyses, the study was just under its target sample size of fifty participants. However, the a priori sample size/power calculation was based on previous research, which found a large effect size between the experimental and control group on the Disgust Scale-Revised measure (DS-R; Olatunji et al., 2007). It is possible that the relationship between sadness and disgust consists of a modest effect, as has been suggested by Fox (2009). Future research with a larger sample size, or an ED population, would be helpful to explore whether an ‘emotion coupling’ effect between sadness and disgust exists.

Measures

While the majority of measures utilised were published tools with adequate psychometric properties, two of the main measures were not. The sadness Visual Analogue Scale (VAS) was developed for the purpose of the study. Single item VASs are commonly used to rate various subjective experiences (Hauser & Walsh, 2008). The sadness VAS was included in addition to the Basic Emotion Scale (BES; Power, 2006) as although the BES has a ‘sadness subscale,’ the items within the scale

do not specifically ask about sadness, (e.g., items include: despair, misery, gloominess, mournful). As the measurement of sadness was a key part of the study hypotheses, it was decided to include the sadness VAS. However, an additional limitation with this decision is the potential for demand effects, i.e., participants may have been alerted to the importance of sadness as a variable of interest within the study, which could potentially influence behaviour.

The Body Shape Silhouettes (BSS) did not have any published psychometrics. The measure was chosen on the basis of Fox et al.'s (2013) results, which found that following an anger mood induction procedure, body size estimation (using the BSS) significantly increased in a clinical AN sample when compared to a healthy control group. It would have been interesting to use dynamic measures of body size estimation within the empirical study, such as a distorting video images technique (e.g., Kulbartz-Klatt et al., 1999). In this technique, individuals are filmed wearing leotards against a neutral background. Participants then adjust a video image of themselves to correspond to their estimation of their body size; the image can be adjusted up to 42% in either direction and is typically presented over various trials at the largest and smallest possible width. Techniques using distorting video images and questionnaire-based body size estimation tools, have shown that individuals with eating difficulties can accurately estimate their actual body size, but have shown greater differences on "felt" or "sensed" body size estimation, when the two measures are compared (e.g., Plies & Florin, 1992). This indicates that it may be important to explore both, actual and sensed facets of body size estimation in future research.

The study's re-wording of the BES 'state version' to reflect how participants felt 'in the present moment,' rather than 'in the last week,' may present a limitation in terms of published psychometrics. However, this change was felt necessary to accurately capture changes in mood over a short period of time (i.e., pre- and post-sadness mood induction). Using the BES to sample more than one emotion was considered a study strength, as it allowed for further investigation of other emotions that may have been unintentionally elicited by the sad mood induction. The review carried out in Paper One suggested that the majority of studies using MIPs in body image research only sample one or two moods, this presents potential study demand effects and reduces the internal validity of the study (i.e., have other emotions been elicited and could they have had an effect of the study results?).

Mood induction procedure limitations

Mood induction procedures (MIPs) are associated with a number of issues related to internal and external validity, consequently it was envisioned that the study's sadness MIP would present with challenges. Perhaps the most pressing issue concerns the ability to produce a mood that is genuine and ecologically valid. Efforts were taken to choose mood induction materials and techniques that had been previously validated, i.e., shown to induce a sad mood, and which had adequate ecological validity, i.e., generalisable to real-world situations. This is considered a study strength, and as noted in Paper One, studies which use previously validated and ecologically sound techniques are in the minority of body image research. However, this may reflect a new era within mood induction procedures as the benefits of using more dynamic media-based methods (e.g., film, images, music) are increasingly being recognised (Gross & Levenson, 1995; Ellard, Farchione & Barlow, 2012), perhaps in response to Velten-type self-statements (1968), which appear to have less ecological validity (Fox et al., 2013).

Despite efforts to use valid and ecological MIP methods, ten participants sadness VAS scores indicated no change between Time 1 and Time 2, while two participants sadness levels decreased. This indicates that the MIP appeared to be successful in 76% of the sample, which is in line with previous research using film, music, and autobiographical recall MIPs, respectively (Martin, 1990; Westermann, et al., 1996). As well as amplifying mood, it was hoped that the use of three MIP methods would increase the chance of inducing a sad mood in participants, as individual differences in response to different techniques have been reported (see Martin, 1990). This was noted in informal conversations with participants after the study ended, some commented that certain sadness inducing methods were more effective than others. The film clip from *The Champ* seemed particularly effective and tended to bring up memories of bereavement to participants. More rare were comments that methods had the opposite effect, but the music clip, Beethoven's *Piano Sonata No. 14*, had positive connotations for a couple of participants. Such issues are difficult to foresee, and while some methods have asked participants to choose a musical piece that would make them feel sad (Sutherland, Newman & Rachman, 1982), this presents additional confounding variables into the study (e.g., demand effects, decreases in internal validity).

Independent raters deemed half of the samples modified Velten technique (1968) material to have potentially induced another emotion in addition to sadness. This reflects another common issue within MIPs, and has theoretical implications for research taking a basic emotions approach i.e., the ability to elicit discrete emotions. This finding underscores the importance of using validated MIP methods and using mood measures which assess change in several emotions.

One final limitation in relation to the sadness MIP concerns potential demand effects. While participants were not given instructions to ‘get into a sad mood’ for the film and music procedures, they were asked to ‘think about a sad event’ in their life during the modified Velten technique (1968), which is a potential cue to participants. Research has suggested various techniques in order to control for demand effects, including, post-experiment questionnaires, or the inclusion of demand control groups. For example, studies using the Velten (1968) MIP have used control groups where participants were instructed to behave *as if* a particular mood state had been induced (e.g., Buchwald et al., 1981), or were informed that the MIP would have an effect that was opposite to the actual mood condition (e.g., Polivy & Doyle, 1980). These techniques, and methods that eliminate the need for MIP instructions, could be considered in future research e.g., film, music, images.

Ethics

Ethical issues related to the sadness MIP were considered during the process of the study design. One challenge consisted of providing participants with enough information about what the study entailed, i.e., being exposed to emotion-eliciting material, while obscuring the exact research aim, i.e., induction of a sad mood to investigate changes in disgust and body size perception. While ethically it is essential to provide participants with informed consent, it was also personally important to make participants aware of the emotion-eliciting study content, as intentionally inducing a sad mood in participants initially felt strange. However, it was useful to reflect that the materials used within the study were nothing unusual within the context of day-to-day life (e.g., watching a sad movie, thinking of a sad event). Including a positive mood induction at the end of the study to counteract the sad mood state was also a useful addition.

Emotion conceptualisation

It is recognised that the theory underlying the research has some limitations. Paper Two utilised a basic emotions approach to emotion conceptualisation, however, this constitutes one of many diverging theoretical accounts of emotion. The wider literature of emotion is fraught with disagreement over emotion conceptualisation, and has been loosely divided into two camps, discrete (basic) emotions approaches and “dimensional” alternatives (see Lindquist, Siegal, Quigley & Barrett, 2013). There is a broad debate within the literature concerning whether emotions can be viewed as being comprised of and built from a core group of basic emotions. In addition, proponents of a basic emotions approach have not yet agreed on which emotions should be considered fundamental. While this is an important theoretical limitation, research building on basic emotions perspectives, such as work based on the SPAARS-ED model (Fox & Power, 2009), provides a working understanding of emotional processes within EDs, which could eventually be used to support formulation and treatment intervention within EDs.

The SPAARS-ED model and ‘emotion coupling’ in EDs

Another theoretical study limitation concerns the notion of ‘emotion coupling,’ as discussed by Power & Dagleish (2008) and Fox & Power (2009) in the SPAARS and SPAARS-ED model of emotion, respectively. Within these models it is hypothesised that two or more basic emotions can become coupled based on a persons learning history. This idea complements emotional inhibition as “acceptable” emotions are proposed to inhibit “unacceptable” emotions (Fox, Federici, & Power, 2012). Based on the SPAARS-ED model (Fox & Power, 2009) and other supporting research (Fox, 2009; Epset et al., 2012), the study conducted in Paper Two proposed that sadness may be viewed as “unacceptable,” and that this emotion may be coupled with, and therefore inhibited by the more “acceptable” emotion of (self-) disgust, as demonstrated by increased levels of disgust.

There are several limitations associated with empirically testing this effect. Firstly, if individuals with eating difficulties are theorised to suppress their emotions, it might be difficult to capture a coupling effect between sadness and disgust using self-report measures. However, guided by the SPAARS-ED model, it was hypothesised that some participants may suppress emotional responses (e.g., sadness)

but that the emotion coupling effect may still be demonstrated by an increase in disgust/self-disgust.

A second issue concerns the high rate of alexithymia often found in those with EDs (Rastam, Gillberg, Gillberg & Johansson, 1997; Bydlowski et al., 2005) and analogue samples (Quinton & Wagner, 2005; Ridout, Thom & Wallis, 2010). Alexithymia refers to the inability to identify and describe emotional states. This presents a limitation to the study as participants were relied upon, through self-report measures, to be able to identify and describe their emotional state, e.g., levels of sadness and disgust. The ability to measure emotion and therefore potentially find a coupling effect could be confounded by this issue. For these particular reasons, the Emotion Regulation Questionnaire (ERQ; Gross and John, 2003) and the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) were included in the study to further assess the level of difficulties with emotion suppression and emotion awareness/clarity, respectively, within the groups. The results showed that the HEC group had higher levels of emotion suppression and lower levels of emotional clarity, which could have affected self-report measures and possibly the study results. Future research should consider the impact of emotion suppression and awareness when designing studies, and possibly use objective and subjective measures to add to the validity of study results.

Thirdly, the high co-morbidity with mood and anxiety disorders in ED (Godart et al., 2007) is an important theoretical limitation, as it is difficult to distinguish between disorder-specific disturbances. For this reason, depression and anxiety scores from the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) were measured and statistically controlled for in main study analyses. This decision has its drawbacks as it may control for symptoms that are a key part of the eating disorder disturbance (Jones, Harmer, Cowen & Cooper, 2008). Interestingly, studies have questioned the role of alexithymia in EDs, as it is closely related to affective comorbidity (Bydlowski et al., 2005; Gilboa-Schechtman, Avnon, Zubery, & Jeczmierny, 2006).

It is curious to note that in Paper Two, the HEC group displayed a significant increase in levels of sadness from Time 1 to Time 2, despite having significantly higher rates of emotion suppression compared to controls, and in light of the issues surrounding alexithymia as discussed above. It is interesting as a population that has reported difficulties with identifying and expressing emotions showed appropriate

changes on self-report measures. It has been suggested that the inexpressiveness/inhibition that is characteristic within EDs (e.g., Forbush & Watson, 2006) may be somewhat accounted for by *ambivalence* over emotional expression, particularly in relation to anger (Quinton & Wagner, 2005). These findings dovetail with Fox (2009), who found that people with AN may not feel entitled to experience emotion, and that expressing anger is seen as risking rejection from others. Similarly, Geller, Cockell, Hewitt, Golder & Flett (2000) found that people with AN suppressed anger more than controls and that individuals with AN had higher levels of silencing the self-schemas, which was interpreted as evidence for the suppression of negative emotions in order to protect interpersonal relationships. In Paper Two, it may be that the less interpersonal nature of filling in self-report questionnaires facilitated emotion expression. The relationship between emotion expression, the concept of alexithymia, as well as the validity of self-report measures in EDs, would be an interesting avenue for future research.

Theoretical implications of study findings

The study did not find evidence to support an emotion coupling effect between sadness and disgust or body size estimation. It may be that this particular coupling effect, as proposed by Fox & Power (2009) in the SPAARS-ED model, does not exist. However, due to the use of a non-clinical sample, this effect cannot be ruled out until further research is conducted with clinical populations. It has also been suggested that anger may be more important than sadness in EDs (Fox, 2009), which is in line with similar research that found a coupling effect between anger and disgust and a relation to body size estimation (Fox & Harrison, 2008; Fox et al., 2013). Paper Two's study findings are in contrast to previous research that has found an effect of sad mood on body size perception in both clinical, analogue and healthy control groups. For example, using a distorting video images technique to measure body width, a sadness MIP led to increased body width estimates in restrained and unrestrained eaters (Plies & Florin, 1992), and in participants with Bulimia Nervosa, but not in those with panic disorder or non-clinical controls (Kulbartz-Klatt, et al., 1999). However, study limitations could have affected the results, for example, there was a lack of a neutral MIP control condition and threats to the validity of the MIP existed e.g., use of an MIP that had not been described as previously validated, demand effects in MIP instructions and only one or two emotions were sampled post-

MIP, all of which reduces confidence that the MIPs produced a genuine mood. In addition, Plies and Florin (1992) did not control for the potential affect of depression on the study findings. These studies highlight the need for further high-quality research to establish the relationship between sadness and changes in body size estimation.

Clinical implications of study findings

The study results suggest that sadness may not have a causal role in feelings of disgust, self-disgust, or increased body size estimations in those with high eating difficulties. Further research will need to be carried out to confirm these findings, particularly with an ED population. As has been suggested, it may be that anger is the more important emotion within EDs, which presents a clear target for formulation and treatment intervention within EDs.

Conclusions

Overall, this thesis aimed to increase our understanding of the role of emotions within eating disorder symptoms, and the validity and reliability of research methods utilised in this literature area. Paper One conducted a systematic review of the literature to examine the methodological quality of mood induction procedures in body image research and the emerging study findings. While Paper Two aimed to test the hypothesised relationship between sadness, (self-) disgust and body size estimation in those with high levels of eating difficulties. The results of the two Papers were in slight contrast to each other. Paper One found support for the role of sadness and 'negative affect' on cognitive aspects of ED symptoms, while Paper Two did not. However, the key review finding concerned the methodological limitations of studies within the literature area, which reduce the validity and reliability of the individual study results and the research base as a whole.

It is clear from both Papers that further high-quality research needs to be conducted to confirm the relationship between mood, in particular sadness, and cognitive ED symptoms. These two studies have helped to fill a gap within the literature by highlighting MIP limitations in body image research, and how the relationship between negative mood and ED symptoms is still unclear, largely due to study weaknesses and theoretical limitations. The two Papers have been complimentary in other respects, the empirical study gave rise to the idea for the

review, which in turn deepened understanding of the limitations of the methodology used within Paper Two, and the quality of the literature area from which it draws from. In this regard, the research has been an excellent learning experience, and has highlighted the benefits of the paper-based thesis approach to the Clinical Psychology Doctorate.

REFERENCES

- Brenner, E. (2000). Mood Induction in Children: Methodological Issues and Clinical Implications. *Review of General Psychology*, 4(3), 264-283. DOI: 10.1037//1089-2680.4.3.264
- Buchwald, A.M., Strack, S., & Coyne, J.C. (1981). Demand Characteristics and the Velten Mood Induction Procedure. *Journal of Consulting and Clinical Psychology*, 49(3), 478-479. DOI: 10.1037/0022-006X.49.3.478
- Bydlowski, S., Corcos, M., Jeammet, P., Paterniti, S., Berthoz, S., Laurier, C.,...Consoli, S.M. (2005). Emotion-Processing Deficits in Eating Disorders. *International Journal of Eating Disorders*, 37, 321–329. DOI: 10.1002/eat.20132
- Campbell, D.T. & Stanley, J.C. (1963). *Experimental and Quasi-Experimental Designs for Research*. Boston: Houghton Mifflin Company.
- Dickson, R., Cherry, M.G. & Boland, A. (2014). Carrying Out a Systematic Review as a Master's Thesis. In A. Boland, M.G. Cherry & R. Dickson (Eds.), *Doing a Systematic Review: A Student's Guide* (pg. 1-16). London: Sage Publications Ltd.
- Effective Public Health Practice Project (1998). Quality Assessment Tool for Quantitative Studies. Available at http://www.ehphp.ca/PDF/Quality%20Assessment%20Tool_2010_2.pdf
- Ellard, K.K., Farchione, T.J., Barlow, D.H. (2012). Relative Effectiveness of Emotion Induction Procedures and the Role of Personal Relevance in a Clinical Sample: A Comparison of Film, Images, and Music. *Journal of Psychopathology and Behavioral Assessment*, 34, 232-243. DOI 10.1007/s10862-011-9271-4
- Espeset, E.M.S., Gulliksen, K.S., Nordbø, R.H.S., Skårderud, F., & Holte, A. (2012). The Link Between Negative Emotions and Eating Disorder Behaviour in Patients with Anorexia Nervosa. *European Eating Disorders Review*, 20, 451-460. DOI: 10.1002/erv.2183

- Fairburn, C.G., & Beglin, S.J. (1994). Assessment of Eating Disorders: Interview or Self-Report Questionnaire? *International Journal of Eating Disorders*, *16*, 363–370. DOI: 10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#
- Forbush, K., & Watson, D. (2006). Emotional Inhibition and Personality Traits: A Comparison of Woman with Anorexia, Bulimia, and Normal Controls. *Annals of Clinical Psychiatry*, *18*(2), 115-121. DOI: 10.1080/10401230600614637
- Fox, J.R.E. (2009). A Qualitative Exploration of the Perception of Emotions in Anorexia Nervosa: A Basic Emotion and Developmental Perspective. *Clinical Psychology and Psychotherapy*, *16*(4), 276–302. DOI:10.1002/cpp.631
- Fox, J.R.E., Federici, A., & Power, M.J. (2012). Emotions and Eating Disorders. In J. R.E Fox, & K. Goss (Eds.), *Eating and its Disorders* (pp. 167-197). Chichester, West Sussex: Wiley-Blackwell.
- Fox, J.R.E., & Harrison, A. (2008). The Relation of Anger to Disgust: The Potential Role of Coupled Emotions within Eating Pathology. *Clinical Psychology and Psychotherapy*, *15*(2), 86–95. DOI: 10.1002/cpp.565
- Fox, J.R.E., & Power, M.J. (2009). Eating Disorders and Multi-Level Models of Emotion: An Integrated Model. *Clinical Psychology and Psychotherapy*, *16*(4), 240-267. DOI:10.1002/cpp.626
- Fox, J.R.E., Smithson, E., Baillie, S., Ferreira, N., Mayr, I. & Power, M.J. (2013). Emotion Coupling and Regulation in Anorexia Nervosa. *Clinical Psychology and Psychotherapy*, *20*, 319-333. DOI: 10.1002/cpp.1823
- Geller, J., Cockell, S.J., Hewitt, P.L., Goldner, E.M., & Flett, G.L. (2000). Inhibited Expression of Negative Emotions and Interpersonal Orientation in Anorexia Nervosa. *International Journal of Eating Disorders*, *28*(1), 8–19. DOI: 10.1002/1098-108X(200007)28:13.0.CO;2-U

- Gilboa-Schechtman, E., Avnon, L., Zubery, E., & Jeczmiern, P. (2006). Emotional Processing in Eating Disorders: Specific Impairment or General Distress Related Deficiency? *Depression and Anxiety, 23*, 331–339. DOI: 10.1002/da.20163
- Godart, N.T., Perdereau, F., Rein, Z., Berthoz, S., Wallier, J., Jeammet, P., & Flament, M.F. (2007). Comorbidity studies of eating disorders and mood disorders. Critical review of the literature. *Journal of Affective Disorders, 97*, 37–49. DOI: 10.1016/j.jad.2006.06.023
- Gratz, K.L. & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41-54. DOI: 10.1007/s10862-008-9102-4
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology, 39*, 281–291. DOI: 10.1017/S0048577201393198
- Gross, J.J., & John, O.P. (2003). Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-Being. *Journal of Personality and Social Psychology, 85*, (2), 348-362. DOI: 10.1037/0022-3514.85.2.348
- Gross, J.J., & Levenson, R.W. (1995). Emotion Elicitation Using Films. *Cognition and Emotion, 9*(1), 87-108. DOI: 10.1080/02699939508408966
- Hatch, A., Madden, S., Kohn, M., Clarke, S., Touyz, S., & Williams, L.M. (2010). Anorexia Nervosa: Towards An Integrative Neuroscience Model. *European Eating Disorders Review, 18*, 165–179. DOI: 10.1002/erv.974
- Hauser, K. & Walsh, D. (2008). Visual Analogue Scales and Assessment of Quality of Life in Cancer. *The Journal of Supportive Oncology, 6*, 277-282. Retrieved from: <http://www.acssurgerynews.com/jso/journal/articles/0606277.pdf>

- Haynos, A.F., & Fruzzetti, A.E. (2011). Anorexia Nervosa as a Disorder of Emotion Dysregulation: Evidence and Treatment Implications. *Clinical Psychology: Science and Practice, 18*, 183–202. DOI: 10.1111/j.1468-2850.2011.01250.
- Henrich, J.H., Heine, S.J. & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2-3), 61-83. DOI: 10.1017/S0140525X0999152X
- Jones, L., Harmer, C., Cowen, P., & Cooper, M. (2008). Emotional face processing in women with high and low levels of eating disorder related symptoms. *Eating Behaviors, 9*, 389-397. DOI: 10.1016/j.eatbeh.2008.03.001
- Khan, K., Kunz, R., Kleijnen, J. & Antes, G. (2003). *Systematic Reviews to Support Evidence-Based Medicine: How to Review and Apply Findings to Healthcare Research*. London: Royal Society of Medicine Press.
- Kring, A.M. (2008). Emotion disturbances as transdiagnostic processes in psychopathology. In, M. Lewis, J.M. Jones-Haviland, & L.F. Barrett (Eds.), *Handbook of Emotion*. Guilford Press, New York, pp. 691–705.
- Kulbartz-Klatt, Y.J., Florin, I. & Pook, M. (1999). Bulimia nervosa: Mood changes do have an impact on body width estimation. *British Journal of Clinical Psychology, 38*, 279-287. DOI: 10.1348/014466599162854
- Lindquist, K.A., Siegel, E.H., Quigley, K.S & Barrett, L.F. (2013). The Hundred-Year Emotion War: Are Emotions Natural Kinds or Psychological Constructions? Comment on Lench, Flores, and Bench (2011). *Psychological Bulletin, 139*(1), 255-263. DOI: 10.1037/a0029038
- Martin, M. (1990). On the Induction of Mood. *Clinical Psychology Review, 10*, 669-697. DOI: 10.1016/0272-7358(90)90075-L
- Mond, J.M., Hay, P.J., Rodgers, B., Owen, C., & Beumont, P.J.V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy, 42*, 551–567.

DOI: 10.1016/S0005-7967(03)00161-X

Olatunji, B.O., Tolin, D.F., Sawchuck, C.N., Williams, N.L., Abramowitz, J.S., Lohr, J.M., & Elwood, L.S. (2007). The Disgust Scale: Item Analysis, Factor Structure, and Suggestions for Refinement. *Psychological Assessment, 19*(3), 281–297. DOI: 10.1037/1040-3590.19.3.281

Plies, I., & Florin, K. (1992). Effects of Negative Mood Induction on the Body Image of Restrained Eaters. *Psychology and Health, 7*, 235–242. DOI: 10.1080/08870449208520024

Polivy, J., & Doyle, C. (1980). Laboratory induction of mood states through the reading of self-referent mood statements: Affective changes or demand characteristics? *Journal of Abnormal Psychology, 89*, 286-290. DOI: 10.1037/0021-843X.89.2.286

Popovich, I., Windsor, B., Jordan, V.M., Showell, M., Shea, B., & Farquhar, C. (2012). Methodological Quality of Systematic Reviews in Subfertility: A Comparison of Two Different Approaches. *PLoS One, 7*(12), e50403. DOI: 10.1371/journal.pone.0050403

Power, M.J. (2006). The structure of emotion: An empirical comparison of six model. *Cognition and Emotion, 20*(5), 694-713. DOI:10.1080/02699930500367925

Power, M., & Dalgleish, T. (1997). *Cognition and emotion: From order to disorder*. Hove, UK: Psychology Press, Taylor and Francis Group.

Quinton, S., & Wagner, H.L. (2005). Alexithymia, ambivalence over emotional expression, and eating attitudes. *Personality and Individual Differences, 38*, 1163–1173. DOI: 10.1016/j.paid.2004.07.013

Rastam, M., Gillberg, C., Gillberg, I.C., Johansson, M. (1997). Alexithymia in anorexia nervosa: a controlled study using the 20-item Toronto Alexithymia Scale. *Acta Psychiatrica Scandinavica, 95*, 385–388. DOI: 10.1111/j.1600-0447.1997.tb09650.x

- Ridout, N., Thom, C., & Wallis, D.J. (2010). Emotion recognition and alexithymia in females with non-clinical disordered eating. *Eating Behaviors, 11*(1), 1–5. DOI: 10.1016/j.eatbeh.2009.07.008
- Sutherland, G., Newman, B. & Rachman, S. (1982). Experimental investigations of the relations between mood and intensive unwanted cognitions. *British Journal of Medical Psychology, 55*, 127-138. DOI: 10.1111/j.2044-8341.1982.tb01491.x
- Velten, E. (1968). A Laboratory Task for Induction of Mood States. *Behaviour Research and Therapy, 6*, 473–482. DOI:10.1016/0005-7967(68)90028-4
- Westermann, R., Spies, K., Stahl, G., & Hesse, F.W. (1996). Relative effectiveness and validity of mood induction procedures: a meta-analysis. *European Journal of Social Psychology, 26*, 557-580. DOI: 10.1002/(SICI)1099-0992(199607)26:4<557::AID-EJSP769>3.0.CO;2-4
- Witt, E.A., Donnellan, M.B & Orlando, M.J. (2011). Timing and selection effects within a psychology subject pool: Personality and sex matter. *Personality and Individual Differences 50*, 355-359. DOI: 10.1016/j.paid.2010.10.019
- Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67*, 361–370. DOI: 10.1111/j.1600-0447.1983.tb09716.x

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- During the submission process you must enter the full title, short title of up to 70 characters and names and affiliations of all authors. Give the full address, including email, telephone and fax, of the author who is to check the proofs.
- Include the name(s) of any **sponsor(s)** of the research contained in the paper, along with **grant number(s)** .
- Enter an **abstract** of up to 250 words for all articles [except book reviews]. An abstract is a concise summary of the whole paper, not just the conclusions, and is understandable without reference to the rest of the paper. It should contain no citation to other published work.
- All articles should include a **Key Practitioner Message** — 3-5 bullet points summarizing the relevance of the article to practice.
- Include up to six **keywords** that describe your paper for indexing purposes.

Research Articles: Substantial articles making a significant theoretical or empirical contribution.

Reviews: Articles providing comprehensive reviews or meta-analyses with an emphasis on clinically relevant studies.

Assessments: Articles reporting useful information and data about new or existing measures.

Practitioner Reports: Shorter articles that typically contain interesting clinical material.

Book Reviews: Published on invitation only. Critical summaries of recent books that are of general interest to readers of the journal.

Reference style . The APA system of citing sources indicates the author's last name and the date, in parentheses, within the text of the paper.

A. A typical citation of an entire work consists of the author's name and the year of publication .

Example: Charlotte and Emily Bronte were polar opposites, not only in their personalities but in their sources of inspiration for writing (Taylor, 1990). Use the last name only in both first and subsequent citations, except when there is

more than one author with the same last name. In that case, use the last name and the first initial.

B. If the author is named in the text, only the year is cited .

Example: According to Irene Taylor (1990), the personalities of Charlotte. . .

C. If both the name of the author and the date are used in the text, parenthetical reference is not necessary .

Example: In a 1989 article, Gould explains Darwin's most successful. . .

D. Specific citations of pages or chapters follow the year .

Example: Emily Bronte "expressed increasing hostility for the world of human relationships, whether sexual or social" (Taylor, 1988, p. 11).

E. When the reference is to a work by two authors, cite both names each time the reference appears .

Example: Sexual-selection theory often has been used to explore patters of various insect matings (Alcock & Thornhill, 1983) . . . Alcock and Thornhill (1983) also demonstrate. . .

F. When the reference is to a work by three to five authors, cite all the authors the first time the reference appears. In a subsequent reference, use the first author's last name followed by *et al* . (meaning "and others") .

Example: Patterns of byzantine intrigue have long plagued the internal politics of community college administration in Texas (Douglas *et al* ., 1997) When the reference is to a work by six or more authors, use only the first author's name followed by *et al* . in the first and all subsequent references. The only exceptions to this rule are when some confusion might result because of similar names or the same author being cited. In that case, cite enough authors so that the distinction is clear.

G. When the reference is to a work by a corporate author, use the name of the organization as the author .

Example: Retired officers retain access to all of the university's educational and recreational facilities (Columbia University, 1987, p. 54).

H. Personal letters, telephone calls, and other material that cannot be retrieved are not listed in References but are cited in the text .

Example: Jesse Moore (telephone conversation, April 17, 1989) confirmed that the ideas. . .

I. Parenthetical references may mention more than one work, particularly when ideas have been summarized after drawing from several sources. Multiple citations should be arranged as follows .

Examples:

- List two or more works by the same author in order of the date of publication: (Gould, 1987, 1989)
- Differentiate works by the same author and with the same publication date by adding an identifying letter to each date: (Bloom, 1987a, 1987b)
- List works by different authors in alphabetical order by last name, and use semicolons to separate the references: (Gould, 1989; Smith, 1983; Tutwiler, 1989).

All references must be complete and accurate. Where possible the DOI for the reference should be included at the end of the reference. Online citations should include date of access. If necessary, cite unpublished or personal work in the text but do not include it in the reference list. References should be listed in the following style:

Journal Article

Gardikiotis, A., Martin, R., & Hewstone, M. (2004). The representation of majorities and minorities in the British press: A content analytic approach. *European Journal of Social Psychology*, 34 , 637-646. DOI: 10.1002/ejsp.221

Book

Paloutzian, R. F. (1996). *Invitation to the psychology of religion* (2nd ed.). Boston: Allyn and Bacon.

Book with More than One Author

Natarajan, R., & Chaturvedi, R. (1983). *Geology of the Indian Ocean* . Hartford, CT: University of Hartford Press. Hesen, J., Carpenter, K., Moriber, H., & Milsop, A. (1983). *Computers in the business world* . Hartford, CT: Capital Press. and so on. The abbreviation *et al.* is not used in the reference list, regardless of the number of authors, although it can be used in the text citation of material with three to five authors (after the initial citation, when all are listed) and in all parenthetical citations of material with six or more authors.

Web Document on University Program or Department Web Site

Degelman, D., & Harris, M. L. (2000). *APA style essentials* . Retrieved May 18, 2000, from Vanguard University, Department of Psychology Website: http://www.vanguard.edu/faculty/ddegelman/index.cfm?doc_id=796

Stand-alone Web Document (no date)

Nielsen, M. E. (n.d.). *Notable people in psychology of religion* . Retrieved August 3, 2001, from <http://www.psywww.com/psyrelig/psyrelpr.htm>

Journal Article from Database

Hien, D., & Honeyman, T. (2000). A closer look at the drug abuse-maternal aggression link. *Journal of Interpersonal Violence*, 15 , 503-522. Retrieved

May 20, 2000, from ProQuest database.

Abstract from Secondary Database

Garrity, K., & Degelman, D. (1990). Effect of server introduction on restaurant tipping. *Journal of Applied Social Psychology*, 20, 168-172. Abstract retrieved July 23, 2001, from PsycINFO database.

Article or Chapter in an Edited Book

Shea, J. D. (1992). Religion and sexual adjustment. In J. F. Schumaker (Ed.), *Religion and mental health* (pp. 70-84). New York: Oxford University Press.

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- Black and white and colour photos - 300 dpi
- Graphs, drawings, etc - 800 dpi preferred; 600 dpi minimum
- Combinations of photos and drawings (black and white and colour) - 500 dpi

The cost of printing **colour** illustrations in the journal will be charged to the author. The cost is approximately £700 per page. If colour illustrations are supplied electronically in either **TIFF** or **EPS** format, they **may** be used in the PDF of the article at no cost to the author, even if this illustration was printed in black and white in the journal. The PDF will appear on the *Wiley Online Library* site.

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APPENDIX 3: University of Manchester Research and Ethics Committee (UREC)

Ethical Approval



**Secretary to Research Ethics Committee 5
Faculty Office - Devonshire House**

Tel: 0161 275 0288

Email: jared.ruff@manchester.ac.uk

Ms Nicola Burke
School of Psychological Sciences
The University of Manchester

8th April 2014

Dear Ms Burke

Research Ethics Committee 5 (Flagged Humanities) - Project Ref 14056

Burke, Fox, Hare: The relation of sadness to disgust: the potential role of coupled emotions within eating behavior (ref 14056)

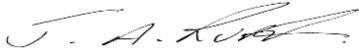
I am writing to thank you for coming to meet with the University Ethics Committee 5 (flagged Humanities) on 10th March 2014 and for submitting the requested changes and clarification to the original material. This letter formally confirms approval for the above project and that no further changes are required to the documentation submitted to the committee.

This approval is effective for a period of five years and if the project continues beyond that period it must be submitted for review. It is the Committee's practice to warn investigators that they should not depart from the agreed protocol without seeking the approval of the Committee, as any significant deviation could invalidate the insurance arrangements and constitute research misconduct. We also ask that any information sheet should carry a University logo or other indication of where it came from, and that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a university computer or kept as a hard copy in a location which is accessible only to those involved with the research.

Finally, I would be grateful if you could complete and return the attached form at the end of the project.

I hope the research goes well.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J. A. Ruff', with a stylized flourish at the end.

Jared Ruff
Senior Research Manager
Faculty of Humanities and Secretary to UREC 5 (Flagged Humanities)
0161 275 0288 jared.ruff@manchester.ac.uk

APPENDIX 4: Study Advertisements

Female Research Participants Needed!

Study looking at **relationships with food and eating.**

£7 reimbursement for taking part

and

Prize draw for 1 of 2 £25 Amazon vouchers

What's involved?

1. Fill in online questionnaire (length= approximately 5 minutes).
2. Visit to Zochonis Building, University of Manchester, to take part in study, which involves being exposed to emotion-eliciting material, and completing some questionnaires (approximate length=45 minutes).

NB: Payment is only available to participants who complete both parts of the study. All participants will be entered into the Amazon voucher prize draw.

| |
|--|
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |
| Contact: nicola.burke-2@postgrad.manchester.ac.uk to take part or visit: https://apps.mhs.manchester.ac.uk/surveys//TakeSurvey.aspx?SurveyID=12L0712K |

APPENDIX A

Participant Information Sheet

Study title: “Exploring relationships with food and eating.”

You are being invited to take part in a research study as part of a Doctorate in Clinical Psychology. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

Who will conduct the research?

Nicola Burke, Trainee Clinical Psychologist, University of Manchester, Clinical Psychology Programme, Zochonis Building, Brunswick Street, Manchester, M13 9PL.

What is the aim of the research?

I am carrying out a study looking at relationships with food and eating.

Why have I been chosen?

You have met the study's inclusion criteria.

What does the study involve?

1. *Complete an online questionnaire looking at relationships with food and eating.*

If you meet the inclusion criteria for the study, with your consent I will contact you to take part in the second stage of the study, which will take place at the Zochonis Building, University of Manchester, where participants will:

2. *The study will involve being exposed to emotion-eliciting material, and completing some questionnaires.*

The study will take approximately 45 minutes.

The study will be run in small groups of participants. If you prefer to complete the study individually, this can also be arranged.

What happens to the data collected?

The data will be statistically analysed to investigate the research question.

How is confidentiality maintained?

Your questionnaires and responses will be treated confidentially. They will be stored securely under lock and key within the University. The data will be anonymised and assigned a code, so that your identity can be protected.

What happens if I do not want to take part or if I change my mind?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason.

Will I be paid for participating in the research?

Yes, participants who take part in both stages of the study (online questionnaire and study at Zochonis Building) will be reimbursed £7 for their time and participation. OR Psychology Undergraduate students can choose to receive 5 research credits (as part of the Student Experiment Participation Scheme; SEPS), for taking part in both stages of the study, instead of the monetary payment. Unfortunately participants who only take part in the online questionnaire will not be able to receive any payment or research credits. All participants (including those who only take part in the online questionnaire) will be entered into a draw to receive one of two available £25 Amazon vouchers.

What is the duration of the research?

The online questionnaire will take approximately 5 minutes to complete. The second stage of the study, at the Zochonis Building, will take approximately 45 minutes to complete.

Where will the research be conducted?

Zochonis Building, University of Manchester, Brunswick Street, Manchester, M13 9PL.

Will the outcomes of the research be published?

Yes, we expect the research findings to be published as an article within a peer-reviewed academic journal.

What if something goes wrong?

If a participant wants to make a formal complaint about the conduct of the research they should contact the Head of the Research Office, Christie Building, University of Manchester, Oxford Road, Manchester, M13 9PL.

*No adverse effects are expected from taking part in this study. However, as a precaution, participants will be asked to provide contact details for their General Practitioner (GP) during the second stage of the study (at the Zochonis Building). Your GP **will not** be contacted, unless during the study the researcher becomes concerned for your health and safety. The researcher would discuss their concerns with you and discuss contacting your GP in this instance. Your GP's contact details will be shredded immediately after your participation in this study.*

If you would like to discuss any concerns after participating in this research, please do not hesitate to contact me, Nicola Burke, or my research supervisor Dr John Fox using the details below.

Contact for further information

Nicola Burke
Division of Clinical Psychology
Second Floor, Zochonis Building
Brunswick Street
Manchester
M13 9PL

email: nicola.burke-2@postgrad.manchester.ac.uk

Research supervisor:
Dr John Fox,
Division of Clinical Psychology
Second Floor, Zochonis Building
Brunswick Street
Manchester
M13 9PL
Email: john.fox@manchester.ac.uk
Tel. +44(0)161 306 0

APPENDIX 6: Consent Form

APPENDIX B.1

CONSENT FORM

“Exploring relationships with food and eating.”

Please give your consent to taking part in the study by reading each statement below, and ticking the box beside it if you agree to the statement.

- | | Please
Initial
Box |
|---|-----------------------------------|
| 1. I confirm that I understand the nature of the proposed study, having read and understood the information sheet provided. I have had opportunity to ask questions (using the contact details provided by the researcher), and I am satisfied with the answers I received. | <input type="checkbox"/> |
| 2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason. | <input type="checkbox"/> |
| 3. I agree to providing my contact details and being contacted by the researcher to take part in the second stage of the study. | <input type="checkbox"/> |
| 4. I understand that I will only receive payment for my participation (or research credits for Psychology undergraduate students) if I am contacted by the researcher to take part in the second stage of the study (at the Zochonis Building) and complete these tasks. | <input type="checkbox"/> |
| 5. I agree to take part in the above named study. | <input type="checkbox"/> |

OPTIONAL QUESTION

- | | |
|--|--------------------------|
| 6. I agree to be contacted about future research studies, and for my contact details to be retained until October 2015 as a source for being contacted. I understand that this does not commit me to taking part in any future studies. I understand that my contact details will be destroyed by October 2015, and I will not be contacted after this point. (If you do not wish to be contacted, do not tick the box. This does not affect your participation in today’s study). | <input type="checkbox"/> |
|--|--------------------------|

APPENDIX 7: Demographic Questionnaire

Background Questionnaire

Today's date:/...../.....
(day) (month) (year)

Birthdate:/...../.....
(day) (month) (year)

Gender (please circle): Female / Male

1. Country of Birth

If not born in UK, where were you born (country)?

.....

Which ethnic group do you most identify with?

- | | | | |
|--|--------------------------|---------------------------|--------------------------|
| British | <input type="checkbox"/> | Caribbean | <input type="checkbox"/> |
| Irish | <input type="checkbox"/> | African | <input type="checkbox"/> |
| Other white background | <input type="checkbox"/> | Other Black Background | <input type="checkbox"/> |
| Indian | <input type="checkbox"/> | White and Black Caribbean | <input type="checkbox"/> |
| Pakistani | <input type="checkbox"/> | White and Black African | <input type="checkbox"/> |
| Bangladeshi | <input type="checkbox"/> | Other mixed background | <input type="checkbox"/> |
| Other Asian Background | <input type="checkbox"/> | Chinese | <input type="checkbox"/> |
| Other Ethnic Group (please specify) _____ | <input type="checkbox"/> | | |

Please specify your native language.....

2. Education

What is your highest level of education that you have completed?

- | | | |
|------------------------------|--------------------------|---------------------|
| No qualifications | <input type="checkbox"/> | |
| GCSEs, CSEs, or O-levels | <input type="checkbox"/> | To end of year ____ |
| A levels/ BTEC | <input type="checkbox"/> | |
| Trade/apprenticeship | <input type="checkbox"/> | |
| University degree | <input type="checkbox"/> | |
| Other (please specify) _____ | <input type="checkbox"/> | |

Which of the following are you?

An undergraduate student

A postgraduate student

Other, please specify _____

3. Health

In the last six months have you sought professional help for any psychological or mental health difficulty you may have experienced? Please tick all that apply:

Psychologist Yes No

Psychiatrist Yes No

Counsellor Yes No

Social Worker Yes No

Other Professional Yes No If yes, please indicate what type of professional.....

Have you been diagnosed with a psychological, psychiatric or physical health difficulty?

Yes No

If YES, please specify.....

Are you currently taking prescription medication? If YES, please specify.....

APPENDIX 8: Sad mood induction procedure-written material

For the next three minutes, I would like you to recall an event in your life, either recently or in the past, which made you feel sad. Please think about what happened, the people involved, what it was that made you feel sad, and try to remember how sad you felt at the time of the event. Please write a brief description of this event in the space below.

Please note this information will be kept confidential.
