

**Exploring and challenging factors that contribute to the
development and maintenance of eating disorders.**

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Declaration page

This thesis has been submitted for the Doctorate in Clinical Psychology at The University of Sheffield. It has not been submitted for any other qualification or to any other institution.

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Overall Abstract

Eating disorders are serious conditions that significantly damage psychological and physical health. If left undetected and untreated, eating disorders can become long-standing, debilitating and life-threatening conditions. To improve the prevention and treatment of eating disorders, factors contributing to the development and maintenance of eating disorder need addressing. This project aimed to inform the prevention and treatment of eating disorders by (i) exploring the association between eating disorder characteristics and fear of negative evaluation, and (ii) experimentally testing the use of surveys, a type of behavioural experiment, for improving body satisfaction and eating disorder characteristics.

First, a systematic literature review was conducted to explore whether fear of negative evaluation, a central feature of social anxiety, is also associated with eating disorder characteristics. If an association is indicated, targeting fear of negative evaluation might improve the prevention and treatment of eating disorders. Through systematically searching three databases (PsycInfo, Medline and Web of Science), the review identified 19 eligible studies. Data related to the association between eating disorder characteristics and fear of negative evaluation were extracted from each paper. Overall, the evidence indicated a moderate association between eating disorder characteristics and fear of negative evaluation. Furthermore, the association was present for both clinical and non-clinical samples, and for different eating disorder characteristics. Potential reasons for the relationship are discussed within the review, and clinical implications are outlined. Study limitations and recommendation for future research are also made.

Body dissatisfaction is suggested to be one of the most consistent predictors of eating disorders in females. Therefore, improving body satisfaction is considered an important factor in the prevention and treatment of eating disorders. Surveys are

routinely used in clinical practice to improve body satisfaction. However, there is limited research evidence supporting this practice. Therefore, the second part of this project formed an experimental study investigating the impact of survey feedback on body satisfaction and eating disorder characteristics. Fifty-seven non-clinical participants were randomly assigned to one of three groups. Participants in the control group received survey feedback unrelated to appearance. In contrast, participants in the experimental groups received either moderate or strong survey feedback related to appearance. Survey feedback unrelated to appearance improved body satisfaction for non-clinical, female, undergraduate students. However, strong survey feedback related to appearance increased body dissatisfaction. Eating attitudes were improved for the full sample, but this effect was not dependent on the type of feedback received. Potential reasons for the results are discussed within the paper, and clinical implications are outlined. Study limitations are identified, and recommendations for future research are made.

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Section One: Literature Review

Is fear of negative evaluation an overlapping mechanism between eating disorder characteristics and social anxiety? A systematic review.

Abstract

Objectives: There is high comorbidity between eating disorders and social anxiety. Research has explored whether fear of negative evaluation, a central feature of social anxiety, is also present within eating disorders. This paper reviewed literature measuring the association between fear of negative evaluation and eating disorder characteristics. If an association is indicated, targeting fear of negative evaluation might improve the prevention and treatment of eating disorders.

Design: A systematic review was carried out to identify and synthesise research measuring the association between eating disorder characteristics and fear of negative evaluation.

Method: A systematic search was conducted of PsycInfo, Medline and Web of Science. Databases were searched, duplicate studies were removed, and remaining articles were assessed for eligibility using specified inclusion criteria. Further, the quality of eligible studies was assessed.

Results: Nineteen studies were identified, testing the association between eating disorder characteristics and fear of negative evaluation. Overall, the evidence indicated a moderate association between eating disorder characteristics and fear of negative evaluation. Furthermore, the association was present for both clinical and non-clinical samples, and for different eating disorder characteristics.

Conclusions: Greater eating disorder characteristics are associated with greater fear of negative evaluation. Potential reasons for this relationship are discussed, and clinical implications are outlined. Furthermore, the findings are considered in relation to the prevention of eating disorders. Further research is needed to explore the association between fear of negative evaluation and eating disorder characteristics in clinical samples.

Practitioner points.

- Clinicians should assess for eating disorder characteristics when working with individuals experiencing social anxiety. If eating disorder characteristics are detected, early intervention should be offered.
- Clinicians should assess fear of negative evaluation when working with individuals with an eating disorder.
- Following assessment and the identification of fear of negative evaluation, a formulation should be developed to inform whether fear of negative evaluation is relevant to the client's eating disorder formulation. If so, interventions targeting social anxiety should be offered if the treatment of the eating disorder does not reduce the social anxiety.
- The effectiveness of interventions for both eating disorders and social anxiety should be evaluated.

Introduction

Eating disorders

Eating disorders are characterised as serious disturbances of eating or weight control behaviour, which significantly damage psychological and physical health (Beat, 2015; Fairburn & Walsh, 2002). The most widely recognised eating disorders are anorexia nervosa and bulimia nervosa (National Institute of Health Clinical Excellence [NICE], 2017). Anorexia nervosa is characterised by very low body weight and fear of weight gain (Treasure, Claudino, & Zucker, 2009). Bulimia nervosa is characterised by binge eating, followed by counteracting behaviours such as vomiting and excessive exercise (NICE, 2017; Treasure et al., 2009).

Eating disorders are associated with negative consequences for the individual, and the people surrounding them (NICE, 2017). Negative consequences of eating disorders can include comorbid psychological difficulties, physical health complications, and mortality from malnutrition (NICE, 2017). If left untreated, eating disorders can become long-standing, debilitating and life-threatening conditions (Levine & Smolak, 2006; NICE, 2017)

Approximately 725,000 people are estimated to be living with an eating disorder in the UK (NICE, 2017). However, a much higher number of females are dissatisfied with their weight and shape, and consequently engage in unhealthy eating and weight management behaviours (Levine & Smolak, 2006). Females who display such attitudes and behaviours are considered at risk of developing clinically significant unhelpful eating behaviour. Therefore, strategies are needed to reduce such risks in non-clinical populations, to prevent eating disorders developing.

Prevention

Attention has been given to developing preventative programmes, to reduce the development of eating disorders within 'at risk' populations. Prevention programmes

are often targeted at female adolescents, a group considered at high risk of developing eating disorders (Fairburn, 2012). A review by Stice, Shaw, and Marti (2007) highlighted that 29% of prevention programmes decrease eating disorder characteristics, and 51% decrease one or more eating disorder risk factors. However, concerns with eating disorder prevention programmes have been highlighted. For example, the content of programmes can be conflicting, as they either emphasise excessive dieting risks, or are directed to prevent obesity (Fairburn, 2012).

It is argued that eating disorder prevention needs improving, and programmes need to target factors and underlying processes impacting the development of eating disorders (DeBoer et al., 2013). To gain a better understanding of factors that might effect the development of eating disorders, the literature exploring comorbid conditions can be considered. Due to high levels of comorbidity, one disorder that is particularly worthy of consideration is social anxiety.

Social Anxiety

Social anxiety is characterised by a persistent avoidance of social situations, and can have negative impacts on daily functioning, social relationships, and quality of life (NICE, 2013).

According to the dominant cognitive models of social anxiety, social anxiety is maintained by negative appraisals and beliefs about the self and the social world (Clarke & Wells, 1995; Rapee & Heimberg, 1997). For example, individuals with social anxiety engage in negative self-appraisals (e.g., anticipate they will fail), and hold assumptions that others will negatively evaluate them because of the failure. Furthermore, individuals believe that positive evaluation from others is important, and overestimate the consequences of negative evaluation. Rapee and Heimberg (1997) suggest that individuals create negative mental representation of themselves based on how they assume others perceive them, and become attentive to the mental representations and

indicators of negative evaluations from others. Further, the authors suggest that perceived negative evaluation from others elicits social anxiety.

When individuals negatively appraise social situations, and presume other people will negatively evaluate them, they might use safety and avoidance behaviours to reduce the risk of negative evaluation from others (e.g., avoid social situations). Further, when such behaviours are used and the individual is not negatively evaluated by others, they believe this is due to the behaviour and not because their beliefs were inaccurate. Interventions informed by the Clark and Wells (1995) and Rapee and Heimberg (1997) models aim to disconfirm negative self-appraisals, perceived negative appraisals from others, and use of safety and avoidant behaviours.

Social Anxiety and Eating Disorders

There are high levels of comorbidity between eating disorders and social anxiety (Hudson, Hiripi, Pope, & Kessler, 2007). Furthermore, social anxiety can precede the development of eating disorders (DeBoer et al., 2013). For individuals with an eating disorder, comorbid social anxiety can act as a barrier for help seeking, decrease engagement in treatment, and have negative impacts on the effectiveness of treatment (Goodwin & Fitzgibbon, 2002). Gaining a better understanding of the links between eating disorders and social anxiety might improve the prevention and treatment of eating disorders.

Within both social anxiety and eating disorders, high levels of anxiety occur when situations are perceived as uncertain (Fang & Hoffmann, 2010; Hocaoglu, 2017; Levinson & Rodebaugh, 2012). Furthermore, both disorders incorporate cognitive biases for negatively appraising social information (Fang & Hoffman, 2010). Therefore, cognitive processes maintaining social anxiety might also be maintaining eating disorders (DeBoer et al., 2013).

Fear of negative evaluation

According to the social anxiety disorder literature and the dominant models cognitive models of social anxiety, a suggested cognitive risk factor and maintaining mechanism for social anxiety is the fear of negative evaluation from others (Clark & Wells, 1995; Clark & Beck, 2011; Leary, 1983; Rapee & Heimberg (1997); Teachman & Allen, 2007). Fear of negative evaluation is described as feeling apprehensive, and experiencing distress, in relation to the expectation of being negatively evaluated by others (Watson & Friend, 1969). Therefore, individuals expressing fear of negative evaluation are more likely to avoid situations where they could be evaluated (Leary, 1983; Levinson et al, 2013).

More recently, the role of fear of negative evaluation has been explored within the eating disorders literature (DeBoer et al., 2013). For example, individuals report fears of being negatively evaluated regarding body shape, body size, and eating patterns (DeBoer et al., 2013; Scheel, 2012). To avoid such fears being confirmed, individuals might modify their behaviours (e.g., restrict eating). Therefore, fear of negative evaluation might be an overlapping mechanism, risk factor, and predictor for both social anxiety and eating disorders. Furthermore, targeting fear of negative evaluation might prevent the development, and improve the treatment, of eating disorders (Levinson et al, 2013).

Current review

A number of studies have explored the relationship between fear of negative evaluation and eating disorders (DeBoer et al., 2013; Levinson et al., 2013; Levinson & Rodebaugh, 2012). However, this evidence has yet to be synthesized and evaluated. A systematic review of all available evidence could improve the understanding of the association between eating disorders and fear of negative evaluation. If the literature provides consistent evidence for an association between eating disorder characteristics and fear of negative evaluation, it might be suggested that fear of negative evaluation is

an overlapping factor between eating disorders and social anxiety. Furthermore, if the association is present in both clinical and non-clinical populations, targeting fear of negative evaluation could inform the prevention and treatment of eating disorders.

Therefore, the aim of this review is to identify and synthesise research examining the association between eating disorder characteristics and fear of negative evaluation. Additionally, the review aims to explore whether associations are different in the following situations: a) between clinical and non-clinical populations, b) with different eating disorder characteristics, and c) when different measures fear of negative evaluation are used. Finally, the review aims to examine whether the findings in this field are consistent, by determining whether effect sizes reported in studies are associated with study quality and when the research was conducted.

Method

Design

In order to meet the aims of this review, a systematic literature review was completed. A systematic approach was chosen due to its being a replicable and rigorous method of identifying, selecting, critically appraising, and synthesising evidence on a specific issue (Gopalakrishnan & Ganeshkumar, 2013; Moher et al., 2009). Systematic reviews are considered important for informing clinical practice guidelines (Moher et al., 2009)

To complete the review, specific aims were to: 1) systematically search the literature for eligible studies; 2) assess the quality of eligible studies; 3) describe characteristics of eligible studies; 4) examine the association between eating disorder characteristics and fear of negative evaluation in clinical and non-clinical populations; 5) examine any differences in association between fear of negative evaluation and different eating disorder characteristics, and when different measures of fear of negative evaluation are used; 6) examine whether effect sizes are associated with quality of

studies; 7) examine whether effect sizes are associated with publications dates; 8) summarise the findings and make links to theory; 9) discuss implications for clinical practice; 10) discuss limitations of the research included in the review, 11) make recommendations for future research; and 12) critique the review.

Literature search

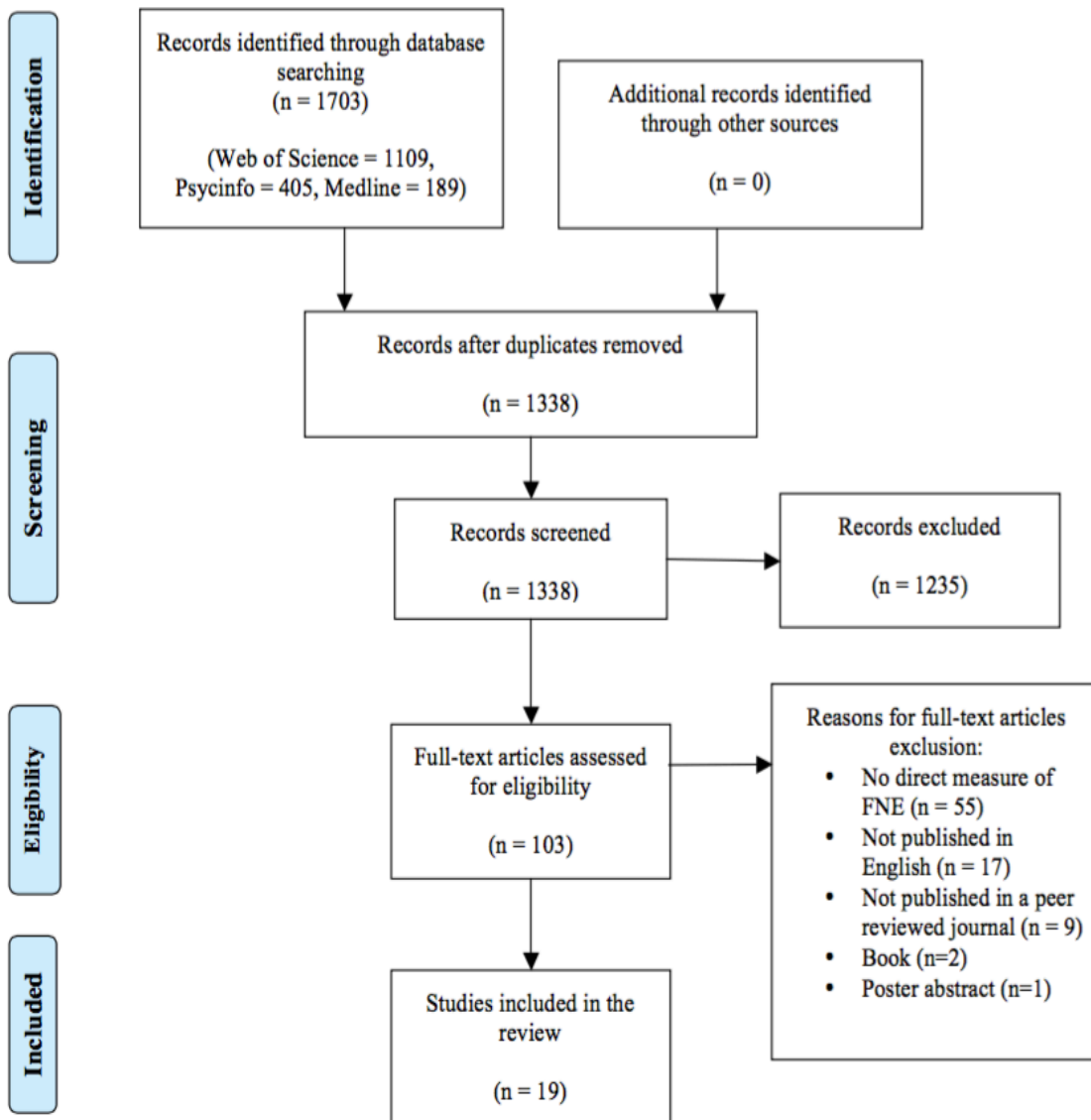
On 24th August 2017, an electronic search was conducted of PsycInfo, Medline and Web of Science. PsycInfo was searched between 1806 and August 2017, Medline between 1946 and August 2017, and Web of Science over ‘all years’. The following search terms were used: (“Anorexia” OR “Bulimia” OR “Eating Disorder”) AND (“Fear of Negative Evaluation” OR “FNE” OR “Social Anxiety” OR “Social Phobia”)

Figure 1 presents a PRISMA flow diagram to illustrate the process of selecting papers for this review (Moher et al., 2009). A PRISMA flow diagram is recommended for inclusion within systematic reviews, as it summarises the literature search and study selection process (Liberati et al., 2009). The searches from each database were collated, and duplicate studies were removed. Titles and abstracts of remaining papers were reviewed against an initial inclusion criterion, which was whether the paper appeared to be exploring eating disorders and fear of negative evaluation. If met, the full article was accessed and assessed for eligibility to be included in the review using the full inclusion criteria.

Eligibility criteria

In line with the aims of the review, eligibility criteria were defined. To be eligible and included in the review, studies must have met all of the following criteria: 1) used a measure of eating disorder; 2) used a measure of fear of negative evaluation; 4) calculated a correlation coefficient between eating disorder characteristics and fear of negative evaluation; 4) published in a peer reviewed journal; and 5) published in English.

Figure 1. PRISMA flow diagram of study selection process.



Data synthesis

The following data were extracted from each eligible study: authors, year of publication, study design, country of recruitment, sample size, percentage of female participants, whether a clinical or non-clinical sample was recruited, specific measures of eating disorders and fear of negative evaluation, mean score on each measure, and the correlation coefficient (r) between the measures. Correlation coefficients were extracted to indicate the strength of association between eating disorder characteristics and fear of negative evaluation. A zero correlation would indicate no association between the two measures. An r of .10 to .29 would indicate a weak association, .30 to .49 a moderate association, and $>.50$ a strong association (Adams & Lawrence, 2014).

To compare findings from different groups (i.e., clinical and non clinical populations, different eating disorder characteristics), mean effect sizes were calculated. To explore variation in findings between studies, ranges of effect sizes were examined.

Effect sizes

To address the latter aims of this review (i.e., examine associations between quality of studies/date of publication and effect sizes), an effect size was extracted from each paper. As correlation coefficients are a measure of effect size, reported correlation coefficients were used (Ellis, 2010). Where a study reported multiple correlations due to using more than one measure, the measure most closely related to the study's initial hypothesis was selected. For studies reporting correlations for each subscale of an eating disorder measure (e.g., Eating Disorders Inventory), a mean effect size for the measure was calculated and used. Finally, if both clinical and non-clinical populations were included in a study, effect sizes were extracted for each group.

Quality appraisal

The Downs and Black (1998) checklist was used to assess the quality of each study included in the review. This tool assesses methodological quality of randomised

and non-randomised studies (Downs & Black, 1998). Specifically, it assesses the quality of reporting, external validity, bias, confounding and power. The checklist contains 27 items, and if all questions are applicable, a maximum score of 32 possible. Most items are scored as either 0 or 1 (0 indicating 'no' or 'unable to determine', and 1 indicating 'yes'). However, question 5 is scored as 0, 1 or 2 (0 indicating 'no', 1 indicating 'partially' and 2 indicating 'yes'). In line with previous studies, question 27 was modified to "was a sample size calculation conducted", and scored as either 0 or 1 (0 indicating 'no' and 1 indicating 'yes') (O'Connor, Tully, Ryan, Bradley, Baxter, & McDonough, 2015). The list of items used in the current review can be found in Appendix A.

As not all questions on the checklist were relevant to the design of the studies included within the review (e.g., cross-sectional studies), only questions relevant to the study design were scored. For the purpose of the review, and to assist in study comparisons in relation to quality, a total quality score was calculated as a percentage, using the following formula: $(\text{total score}/\text{number applicable questions}) \times 100$.

The first author completed the main quality appraisal. In addition, a final year Doctor of Clinical Psychology trainee (with experience of using the Downs and Black checklist) repeated the appraisal on 20% (n=4) of the studies. These studies were randomly selected, and the second reviewer was blind to the first authors' ratings. Scores developed by the first and second reviewers were compared, and discrepancies were highlighted. A discussion was held around the disagreements, and a consensus on scoring was reached. These scores were included in the final quality assessment.

Results from the quality appraisal were used to inform the decision regarding whether to reject papers due to poor quality. Any papers receiving a score below 40% was considered poor quality, and would therefore be rejected from the review. The results of the quality appraisal were also used to help understand whether study quality

impacted outcomes.

Results

As shown in Figure 1, combining search results from the three databases identified 1703 studies. Duplicate studies were removed (n=365), and titles and abstracts of remaining studies (n=1338) were screened for eligibility by assessing whether or not the study appeared to be exploring both eating disorders and social anxiety. Following this assessment, 103 full articles were accessed and fully assessed for eligibility using inclusion criteria. This process eliminated 84 papers, leaving 19 eligible for the review. Reasons for elimination are included in the PRISMA flow diagram (Figure 1). Reference lists of eligible papers were also scanned. However, this did not lead to the inclusion of further papers.

Description of Studies

All studies included in the review are summarised in Table 1. The 19 studies had a combined sample size of 3395 participants. Individual sample sizes within each study ranged from 21 to 375 participants. There were no overlapping data across the studies.

The majority of studies used a cross-sectional design (n=17). However, one study used a cohort design, and one study used an experimental design. Most studies recruited a non-clinical sample (n=17). However, one study recruited a clinical sample from an eating disorder service, and one study recruited both a clinical and non-clinical sample. Furthermore, most studies recruited only female participants (n=16). The majority of studies recruited samples from the USA (n=11) and the UK (n=5).

Table 1. *Details of studies included in the review.*

Study no.	Authors (Year)	Study design	Country	Sample size N = (% Female)	Clinical sample?	Measure(s) of ED	Measure of FNE	ED Mean (SD)	FNE Mean (SD)	Correlation Coefficient	Significant association?
1	Bremser & Gallup (2012)	Cross sectional	USA	122 (59)	N	EAT-26	FNE*	9.09 (8)	12.61 (8.21)	.33***	Y
2	Chang et al. (2014)	Cross sectional	Canada	305 (100)	N	EDE-Q	BFNE	3.61 (0.65)	23.87 (12.20)	.32***	Y
3	DeBoer et al. (2013)	Experimental	USA	82 (100)	N	EDDS	BFNE	16.77 (10.67)	34.43 (9.92)	.44**	Y
4	Gilbert & Meyer (2003)	Cross sectional	UK	80 (100)	N	EDI	FNE*	DT = 6.56 (6.34) BD = 13.3 (8.23) B = 1.98 (3.25)	16.3 (6.74)	DT = .43** BD = .41** B = .27**	Y
5	Gilbert & Meyer (2005a)	Cross sectional	UK	91 (100)	N	EDI	FNE*	DT = 4.44 (5.00) BD = 10.96 (7.42) B = 0.98 (1.95)	FNE = 35.9 (9.14)	DT = .30** BD = .30** B = NR	Y
6	Gilbert & Meyer (2005b)	Cross sectional	UK	143 (100)	N	EDI	BFNE	DT = 4.64 (5.92) BD = 11.5 (8.67) B = 1.88 (3.17)	38.6 (10.0)	DT = .23** BD = .05 B = .11	Y
7	Hamann et al. (2009)	Cross sectional	USA	119 (100)	N	BULIT-R	BFNE	57.58 (21.05)	39.99 (9.32)	.40***	Y
8	Hinrichsen et al. (2003)	Cross sectional	UK	NC: 50 (100) BN: 59 (100) RA: 21 (100) BA: 34 (100)	Y (NC, BN, RA, BA)	BITE symptom BITE severity	FNE	BITE symptom NC: 6.68 (5.52) BN: 23.3 (3.73) RA: 14.0 (7.32) BA: 18.5 (6.23)	NC: 18.5 (6.97) BN = 23.6 (6.72) RA: 23.5 (8.86) BA: 26.7 (4.32)	BITE symptom NC: .39** BN: .34** RA: .20 BA: .08	Y
							BITE (severity) NC: 1.50 (1.84) BN: 13.2 (5.96) RA: 3.62 (4.51) BA: 11.7 (6.03)			BITE severity NC: .28* BN: .12 RA: .17 BA: .02	

Table 1. (continued)

Study no.	Authors (Year)	Study design	Country	Sample size N = (% Female)	Clinical sample?	Measure(s) of ED	Measure of FNE	ED Mean (SD)	FNE Mean (SD)	Correlation Coefficient	Significant association?
9	Levinson & Rodebaugh (2012)	Cross Sectional	USA	118 (62)	N	EDI EDE-Q	BFNE	NR	NR	EDI DT = .42*** BD = .42*** B = .36*** EDE-Q R = .36*** EC = .42*** WC = .33*** SC .48***	Y
10	Levinson & Rodebaugh (2015)	Cross Sectional	USA	160 (100)	N	EDI - BD	BFNE	54.04 (18.12)	22.49 (7.10)	BD = .44***	Y
11	Levinson & Rodebaugh (2016)	Cohort	USA	300 (100)	N	EDI	BFNE	DT: 14.71 (6.66) BD: 5.64 (8.83) B: 13.63 (5.08)	23.33 (6.94)	DT = .31** BD = .35** B = .33**	Y
12	Levinson et al. (2013)	Cross Sectional	USA	232 (74)	N	EDI	BFNE	22.18 (9.56)	21.35 (7.08)	.48**	Y
13	Magalleres (2013)	Cross Sectional	Spain	375 (100)	N	EAT-26	BFNE	NR	NR	.37**	Y
14	McClintock & Evans (2001)	Cross sectional	New Zealand	252 (100)	N	EAT	BFNE	8.41 (8.72)	36.30 (9.17)	.44*	Y

Table 1. (continued)

Study no.	Authors (Year)	Study design	Country	Sample size N = (% Female)	Clinical sample?	Measure(s) of ED	Measure of FNE	ED Mean (SD)	FNE Mean (SD)	Correlation Coefficient	Significant association?
15	Menatti et al. (2015)	Cross sectional	USA	167 (100)	N	EDI	BFNE	DT = 6.2 (5.65) BD = 10.39 (7.67) B = 1.45 (2.46)	21.32 (7.43)	DT = .44*** BD = .40*** B = .39***	Y
16	Peat & Muehlenkamp (2011)	Cross sectional	USA	214 (100)	N	EDI-3	BFNE	36.25 (6.33)	35.46 (9.35)	.31**	Y
17	Sweetingham & Waller (2008)	Cross sectional	UK	92 (100)	Y	EDI	BFNE	NR	NR	DT = NR BD = .50*** B = NR	Y
18	Utschig et al. (2010)	Cross sectional	USA	210 (100)	N	EDDS	BFNE	10.48 (6.98)	15.18 (7.12)	.41**	Y
19	Wonderlich-Tierney & Vander Wal (2010)	Cross sectional	USA	169 (100)	N	EAT-26	BFNE	9.31 (9.87)	36.40 (9.52)	.23***	Y

Notes: ED = Eating disorder; FNE = Fear of negative evaluation; FNE* = Fear of Negative Evaluation Scale; BFNE = Brief Fear of Negative Evaluation scale; EAT-26 = Eating Attitudes Test; EDE-Q = Eating Disorders Examination - Questionnaire; EDDS = Eating Disorder Diagnostic Scale; EDI = Eating Disorder Diagnostic Inventory; DT = Drive for thinness subscale; BD = Body dissatisfaction subscale; B = Bulimia symptoms subscale; BULIT-R = The Bulimia Test - Revised; BITE Symptom = Bulimic Investigatory Test Edinburgh Symptom subscale; BITE Severity = Bulimic Investigatory Test Edinburgh Severity subscale; NC = Non clinical; BN = Bulimia nervosa; RA = Restrictive anorexia; BA = Binge-purge anorexia; NR = not reported; EDI-3 = Eating Disorder Risk Composite.

*p < 0.05; ** p < 0.01; ***p < 0.001.

Other countries of recruitment included Spain, New Zealand and Canada.

As per the inclusion criteria, all studies used a specific measure of eating disorder and fear of negative evaluation. Other outcomes were measured in each study. However, as per the aims, only eating disorder characteristics and fear of negative evaluation measures were of interest in this review. The most frequently used measures of eating disorder were the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) and the Eating Attitudes Test (EAT-26; Garner, Olmstead, Bohr & Garfinkel, 1982). Other measures included the Eating Disorder Diagnostic Scale (EDDS; Stice, Telch & Rizvi, 2000), the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994), and the Eating Disorder Risk Composite (EDI-3; Garner, 2004). In addition, two studies used specific measures of Bulimia, The Bulimia Test - Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991), and the Bulimic Investigatory Test Edinburgh (BITE; Henderson & Freeman, 1987). To measure fear of negative evaluation, the majority of studies (n=15) used the Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983). However, four studies used the original Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969)

Effect sizes

Table 2 presents data extracted from each paper to assess associations between effect size and publication date, and effect size and quality score of studies. Histograms and tests of normality indicated that all data were non-normally distributed. Therefore, using SPSS v.23, Spearman's rho correlations were calculated to examine any significant associations between the variables.

Table 2: Year of publication, quality score of studies, and effect size for each study.

Study No	Year of Publication	Quality Score (%)	Sample	Measure of ED	r
1	2012	44	NC	EAT-26	.33
2	2014	50	NC	EDE-Q-R	.32
3	2013	50	NC	EDDS	.44
4	2003	50	NC	EDI (mean)	.37
5	2005	44	NC	EDI (mean)	.30
6	2005	68	NC	EDI (mean)	.23
7	2009	53	NC	BULIT-R	.40
8	2003	50	NC	BITE Symptom	.39
8	2003	50	BN	BITE Symptom	.34
9	2012	56	NC	EDI (mean)	.40
10	2015	50	NC	EDI-BD	.44
11	2016	63	NC	EDI (mean)	.33
12	2013	56	NC	EDI	.48
13	2013	56	NC	EAT-26	.37
14	2001	56	NC	EAT-26	.41
15	2015	63	NC	EDI (mean)	.41
16	2011	50	NC	EDI-3	.31
17	2008	53	ED	EDI-BD	.50
18	2010	50	NC	EDDS	.41
19	2010	50	NC	EAT-26	.23

Notes: r = effect size; EP = Eating disorder characteristics; NC = Non clinical; BN = Bulimia nervosa; EAT-26 = Eating Attitudes Test; EDE-Q = Eating Disorders Examination - Questionnaire; EDDS = Eating Disorder Diagnostic Scale; EDI-BD = Eating Disorders Inventory; BD = Body Dissatisfaction subscale; BUILT-R = The Bulimia Test - Revised; BITE Symptom = Bulimic Investigatory Test Edinburgh Symptom subscale; EDI-3 = Eating Disorder Risk Composite.

Result of quality appraisal

Following the quality appraisal using the Downs and Black checklist, studies received a quality rating between 44% and 68% (see Table 3). The first author interpreted overall study quality as being fair to good quality. No studies received a score below 40%; therefore no studies were excluded from the review on the basis of poor quality

Table 3. Results of the quality assessment using the Downs and Black Checklist.

Study no.	Authors (year)	Downs and Black Checklist Questions																				Total Quality Score (%*)							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		21	22	23	24	25	26	27
1	Bremser & Gallup (2012)	1	1	0	X	0	1	1	X	X	0	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	7/16 (44)
2	Chang et al. (2014)	1	1	0	X	0	1	1	X	X	1	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)
3	DeBoer et al. (2013)	1	1	1	1	0	1	1	0	0	1	0	0	0	0	0	1	1	1	1	1	1	0	X	X	0	0	13/26 (50)	
4	Gilbert & Meyer (2003)	1	1	1	X	0	1	1	X	X	0	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)
5	Gilbert & Meyer (2005)	1	1	0	X	0	1	1	X	X	0	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	7/16 (44)
6	Gilbert & Meyer (2005)	1	1	0	X	0	1	1	X	X	1	1	0	X	X	X	1	1	1	X	1	X	1	X	X	1	1	0	13/19 (68)
7	Hamann et al. (2009)	1	1	0	X	1	1	1	X	0	0	0	0	X	X	X	0	1	1	X	1	X	1	X	X	1	0	10/19 (53)	
8	Himrichsen et al. (2003)	1	1	1	X	0	1	1	X	X	0	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)
9	Levinson & Rodebaugh (2012)	1	1	0	X	1	1	1	X	X	0	0	0	X	X	X	1	X	1	X	1	X	0	X	X	1	X	0	9/16 (56)
10	Levinson & Rodebaugh (2015)	1	1	0	X	0	1	1	X	X	1	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)
11	Levinson & Rodebaugh (2016)	1	1	0	X	0	1	1	X	X	1	1	0	X	X	X	1	1	1	X	1	X	1	X	X	0	1	0	12/19 (63)

Table 3. (continued)

Study no.	Authors (year)	Downs and Black Checklist Questions																										Total Quality Score (%*)
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
12	Levinson et al. (2013)	1	1	0	X	1	1	1	X	X	0	0	X	X	X	1	X	1	X	1	X	0	X	X	1	X	0	9/16 (56)
13	Magalleres (2013)	1	1	1	X	0	1	1	X	X	1	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	9/16 (56)
14	McClintock & Evans, 2001)	1	1	0	X	1	1	1	X	X	0	0	X	X	X	1	X	1	X	1	X	0	X	X	1	X	0	9/16 (56)
15	Menatti et al. (2015)	1	1	0	X	1	1	1	X	X	1	0	X	X	X	1	X	1	X	1	X	0	X	X	1	X	0	10/16 (63)
16	Peat & Muehlenkamp (2011)	1	1	0	X	0	1	1	X	X	0	0	X	X	X	1	X	1	X	1	X	1	X	X	0	X	0	8/16 (50)
17	Sweetingham & Waller (2008)	1	1	1	X	0	1	1	X	X	1	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	9/16 (53)
18	Utschig et al. (2010)	1	1	0	X	0	1	1	X	X	1	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)
19	Wunderlich-Tierney & Vander Wal (2010)	1	1	1	X	0	1	1	X	X	0	0	X	X	X	1	X	1	X	1	X	0	X	X	0	X	0	8/16 (50)

Notes: X = not applicable to study design; %* = total quality percentage calculated out of applicable items

All studies clearly described the main aims and hypotheses, outcomes being measured, and main findings. However, 13 studies failed to provide eligibility criteria for their sample. Furthermore, all studies failed to provide a detailed description of their recruitment strategy. Therefore, it was difficult to assess how participants were selected, and whether they were representative of the source population. Additionally, all studies failed to provide a sample size calculation. Therefore, it was not possible to assess whether studies were appropriately powered. It was also difficult to determine whether the majority of studies acknowledged and controlled for confounding variables, therefore the presence of confounding variables were likely.

Review of the main findings.

All studies included in this review explored the association between eating disorder characteristics and fear of negative evaluation. As presented in Table 1, the correlation coefficients extracted from each study will be used to address each aim of this review. Furthermore, as presented in Tables 4-6, the mean and ranges of effect sizes will be used to aid the comparison of findings from different groups and measures.

1) Are eating disorder characteristics associated with fear of negative evaluation? Table 1 presents the correlation coefficients extracted from each study. While the size of the association ranged from $r = .03-.50$, there was a moderate mean overall effect size of $r = 0.33$ ($SD = .12$). Therefore, it can be concluded that fear of negative evaluation is moderately and positively associated with eating disorder characteristics.

2) Are associations between eating disorder characteristics and fear of negative evaluation different between clinical and non-clinical populations? Due to the small number of studies recruiting a clinical sample ($N=2$), it is difficult to determine whether the association between eating disorder characteristics and fear of negative evaluation differs between clinical and non-clinical samples. However,

tentative comparisons will be made.

Table 4 presents the mean and range of effect sizes for the clinical and non-clinical samples. While the size of the association ranged for both samples, there was a moderate mean effect size for non-clinical samples, and a small mean effect size for clinical samples. Therefore, in comparison to non-clinical populations, there was a weaker association between fear of negative evaluation and eating disorder characteristics within clinical populations. However, this finding must be interpreted with caution due to the limited number of studies recruiting a clinical sample

Table 4. Mean and ranges of effect sizes for the association between eating disorder characteristics and fear of negative evaluation, for clinical and non-clinical samples.

Sample	Number of studies	Mean effect size (SD)	Range
Clinical	2	.20 (.17)	.02 to .50
Non-clinical	18	.35 (.10)	.05 to .48

Notes: SD = standard deviation

3) Are there differences in associations between FNE and different eating disorder characteristics? A number of studies used the EDI to measure the association between different eating disorder characteristics and fear of negative evaluation. All studies using the EDI subscales recruited non-clinical samples, with the exception of one clinical study using the body dissatisfaction subscale (Sweetingham & Waller, 2008). In an attempt to make the findings more comparable, only data from non-clinical samples will be explored.

Table 5 presents the mean and range of effect sizes for the different eating disorder characteristics. While the size of the association ranged for all eating disorder characteristics, there was a small to moderate mean effect size for drive for thinness, body dissatisfaction, and bulimia. Therefore, there were little differences in the associations between fear of negative evaluation and the different eating disorder characteristics.

Table 5. Mean and ranges of effect sizes for the association between different eating disorder characteristics and fear of negative evaluation.

Element of eating disorder characteristics	Number of studies	Mean effect size (SD)	Range
Body Dissatisfaction	7	.34 (.14)	.05 to .44
Drive for Thinness	6	.36 (.09)	.23 to .44
Bulimia	5	.29 (.11)	.11 to .39

Notes: SD = standard deviation

4) Are there differences in associations when different measures of fear of negative evaluation are used? Due to the limited number of studies using the original FNE (N=4), it is difficult to determine whether the association between eating disorder characteristics and fear of negative evaluation differs when different measures of fear of negative evaluation are used. However, tentative comparisons will be made.

Table 6 presents the mean and range of effect sizes when both the FNE and BFNE were used. While the size of association ranged when both measures were used, there was a moderate mean effect size when the BFNE was used, and a small mean effect size when the FNE was used. Therefore, in comparison to using the BFNE, there was a weaker association between fear of negative evaluation and eating disorder characteristics when the FNE was used. However, this finding must be interpreted with caution due to the limited number of studies using the FNE.

Table 6. Mean and ranges of effect sizes for the association between eating disorder characteristics and different measures of fear of negative evaluation

Measure of FNE	Number of studies	Mean effect size (SD)	Range
BFNE	15	.36 (.10)	.05 to .50
FNE*	4	.26 (.13)	.02 to .43

Notes: FNE = fear of negative evaluation; SD = standard deviation; BFNE = Brief Fear of Negative Evaluation scale; FNE* = Fear of Negative Evaluation Scale.

5) Is there a significant association between study quality and effect size?

Spearman's rho correlations were calculated using the quality score and effect sizes

from each study. A two-tailed test indicated that there was no significant association between the quality of each study and effect size ($r = -.01$, $p = .95$).

6) Is there a significant association between publication date and effect size?

Spearman's rho correlations were conducted using the publication date and effect sizes from each study. A two-tailed test indicated no significant association between publication date and effect size ($r = .30$, $p = .18$).

Discussion

The aim of this paper was to systematically review the literature in order to determine the association between eating disorder characteristics and fear of negative evaluation. An association between eating disorder characteristics and fear of negative evaluation might indicate that fear of negative evaluation is an overlapping mechanism between social anxiety and eating disorders. This finding would inform the prevention, detection and treatment of eating disorders.

This discussion will summarise the main findings, and consider them in relation to existing literature and theory. Clinical implications from the findings will also be drawn. Limitations of the research including in this review will be discussed, along with directions for future research. Finally, the current review will be critiqued.

Summary of the main findings.

This is the first systematic review to synthesise research examining the association between eating disorder characteristics and fear of negative evaluation. Findings from 19 studies suggest that fear of negative evaluation is associated with eating disorder characteristics. Therefore, individuals reporting greater eating disorder characteristics also have greater fears of being negatively evaluated. Furthermore, the findings suggest that the association might be weaker within clinical populations. However, this finding needs interpreting with caution, as more research is needed to explore the association between fear of negative evaluation and eating disorders within

clinical populations.

Within non-clinical samples, associations were identified between different eating disorder characteristics and fear of negative evaluation. In comparison to using the original measure of FNE, stronger associations were identified when the BFNE was used. Finally, there were no significant associations between the quality of each study and effect sizes, or publication date and effect sizes.

Findings in relation to existing literature and theory.

Existing theory and literature will be used to understand the association between fear of negative evaluation and eating disorder characteristics.

How can the association between eating disorder characteristics and fear of negative evaluation be explained?

Cognitive behavioural model. First, a cognitive behavioural model will be used to understand the relationship between fear of negative evaluation and eating disorder characteristics. The cognitive behavioural model suggests that cognitions, emotions and behaviours interact with each other, with negative cognitions resulting in distressing feelings and problematic behaviors (Kennerley, Kirk, & Westbrook, 2016). In the context of this review, it might be suggested that fear of negative evaluation is a negative cognitive process, leading to distressing feelings and problematic behaviors related to eating and weight control.

For example, an individual might experience fear of being negatively evaluated in relation to what they eat, or how they look. To avoid such evaluation, they might engage in unhelpful eating and weight-control behaviours. For example, to avoid being evaluated based on how much they eat, they might restrict their eating (i.e., not eating in front of others, or eating less) (Waller et al., 2007). Furthermore, to avoid being evaluated based on body shape and size, they might avoid people, or conceal their body with oversized clothes.

Therefore, it might be argued that fear of negative evaluation of one's eating and weight can lead to disordered eating and weight-control behaviours. If such thoughts and behaviours remain unidentified, they might lead to clinically significant disordered eating and weight-control behaviour.

Social networks. Social networks might influence and impact the relationship between fear of negative evaluation and eating disorder characteristics (Treasure & Kanakam, 2013). Furthermore, influence from social networks might explain the association identified between drive for thinness and fear of negative evaluation. For example, if thinness is valued within a social network, individuals might believe that they will be negatively evaluated if they do not aspire to the 'thin ideal'. As a result, they might become preoccupied with shape and weight, and use unhelpful behaviors in order to be thin and accepted by others. If they do not engage in such behaviours, they might fear that their social network will negatively evaluate them, or reject them for not fitting with idealised standards.

Attachment theory. The attachment literature can also be used to understand the relationship between fear of negative evaluation and eating disorder characteristics. Attachments are formed and shaped by early experiences, and influence how people perceive and react within social interactions in adulthood (De Paoli, Fuller-Tyszkiewicz, Halliwell, Puccio, & Krug, 2017). Therefore, dependent on early experiences, individuals develop different attachment styles. An insecure attachment style is associated with both eating disorders and fear of negative evaluation (Illing, Tasca, Giorgio, Balfour, & Bissada, 2010; De Paoli et al., 2017). It is suggested that individuals with insecure attachments expect to be rejected or negatively evaluated by others (Downey & Feldman, 1996). Furthermore, individuals who are sensitive to rejection can be more vulnerable to negative comments about appearance (De Paoli et al., 2017).

As a protective mechanism, individuals can avoid situations so they cannot be rejected or negatively evaluated (De Paoli et al., 2017). However, individuals with insecure attachments rely on others for validation of self-worth (De Paoli et al., 2017). Therefore, individuals might find themselves in a dilemma between needing validation from others, and fearing that they will be rejected or negatively evaluated. To manage such a dilemma, and protect themselves against negative evaluation and rejection, individuals might be motivated to strive to meet perceived ideals. If perceived ideals are related to 'thinness', individuals might engage in unhelpful eating behaviours to meet ideals, to reduce the risk of being negatively evaluated or rejected.

Clinical implications.

The evidence within this review suggests that eating disorder characteristics are associated with fear of negative evaluation. Therefore, fear of negative evaluation might be a cognitive feature impacting the development and maintenance of eating disorders. This association provides further understanding of the comorbidity between social anxiety and eating disorders, and highlights opportunities for preventing, detecting and treating eating disorder. Such opportunities will be discussed.

Prevention. As noted by DeBoer et al. (2013), eating disorder prevention programs should target factors that impact the development and maintenance of eating disorders. As the majority of the studies in this review used a cross-sectional design, it was not possible to draw conclusions regarding causality (i.e., whether fear of negative evaluation leads to the development of eating disorders). However, the review has highlighted that greater fear of negative evaluation is associated with greater eating disorder characteristics. Therefore, reducing fear of negative evaluation in non-clinical populations might also reduce eating disorder characteristics. This finding might be incorporated into prevention techniques.

Primary prevention techniques use universal approaches to reduce rates of new

cases of a given disorder (Caplan, 1964). Primary prevention targets groups of healthy individuals, or individuals who are non-symptomatic but at high risk of developing disorders (Caplan, 1964). In the context of eating disorder prevention, primary approaches might consider promoting techniques and skills to reduce fear of negative evaluation and social anxiety in young people. For example, school-based programs could be used to promote wellbeing, and help young people build positive coping skills before unhelpful cognitions (e.g., fear of negative evaluation) and unhelpful behaviours are established (Barrett & Cooper, 2014).

To date, no primary prevention programmes have specifically targeted social anxiety (Zalta, 2011). However, The FRIENDS program is considered an effective universal preventative programme for anxiety (Murphy, Stephan, & Jellinek, 2017). Delivering the FRIENDS program in schools teaches young people how to recognise feelings and physical symptoms associated with anxiety, teaches selective attention skills and how to focus on positive information, how to challenge unhelpful thoughts, and problem-solving skills (Barrett & Turner, 2004). Furthermore, building selective-attention skills and learning to focus on positive information is suggested to reduce fear of negative evaluation (Barrett & Cooper, 2014). Therefore, such techniques might be used to reduce fear of negative evaluation within non-clinical populations.

As social networks might influence and impact the relationship between fear of negative evaluation and eating disorder characteristics, primary prevention might also encourage young people to develop positive support networks. Positive support networks might reduce feelings of vulnerability, fear of rejection, and fear of negative evaluation (Barrett & Cooper, 2014).

Detection. Secondary prevention techniques use targeted approaches, to reduce the prevalence of disorders within ‘at risk’ populations (Caplan, 1964). Secondary prevention targets groups of individuals who are at high risk due to predictive factors

(Caplan, 1964). Individuals experiencing fear of negative evaluation and social anxiety might be considered at risk of developing eating disorders in the future (DeBoer et al., 2013). Therefore, secondary prevention might consider assessing the presence of eating disorder characteristics within individuals experiencing social anxiety. This assessment could increase detection of eating disorders. Early detection of eating disorder characteristics might prevent clinically significant eating disorders developing.

When working with clients with social anxiety, eating disorder characteristics should be explored during assessments, and measures of eating disorders should be administered. Such an assessment might uncover negative attitudes towards eating and weight, underpinned by fear of negative evaluation. If an assessment detects early signs of an eating disorder, interventions should be offered to address fears of negative evaluation and prevent clinically significant eating disorders developing. CBT techniques commonly used for social anxiety could be employed (e.g., cognitive restructuring and exposure exercises) (Rodebaugh, Holaway, & Heimberg, 2004).

Treatment. The findings of this review indicate that fear of negative evaluation might be a cognitive feature impacting the development and maintenance of both eating disorders and social anxiety. Therefore, fear of negative evaluation might explain the comorbidity between the two disorders. As noted, comorbid social anxiety can decrease engagement in treatment, and have negative impacts on the effectiveness of treatment (Goodwin & Fitzgibbon, 2002). To improve the effectiveness of treatment for eating disorders, clinicians working within eating disorders services should assess for comorbid social anxiety, and the presence of fear of negative evaluation.

An assessment for social anxiety can be informed by using outcome measures (e.g., BFNE), clinical interviews, and through observing clients with other people (Waller et al., 2007). If detected, a formulation should be developed to understand whether social anxiety is relevant to the development and maintenance of the eating

disorder. For example, Waller et al. (2007) propose an eating disorder formulation incorporating beliefs related to social anxiety. If fear of negative evaluation is relevant, that formulation can inform treatment.

Treating social anxiety is likely to impact on eating disorder characteristics (Waller et al., 2007). Interventions can be informed by evidence-based CBT techniques commonly employed for social anxiety (e.g., behavioural experiments, including dropping safety behaviours, video feedback, and cognitive restructuring) (Waller et al., 2007). The effectiveness of any intervention should be evaluated using outcome measures. Measures of social anxiety and eating disorder characteristics (e.g. BFNE, EDI) should be completed before and after the intervention. Furthermore, it is also possible that addressing the eating disorder will reduce social anxiety.

Research limitations and directions for future research

It is important to acknowledge limitations of the studies included in this review, as they could limit the interpretability and the generalisability of the findings. The first limitation noted within the current evidence base is the lack of studies recruiting from clinical populations. Only two studies measured both eating disorder and fear of negative evaluation within clinical samples. This lack of research reduces the generalisability of findings to clinical populations. Furthermore, it limits the validity of recommendations made for clinical practice. Future research exploring eating disorders and fear of negative evaluation should recruit clinical samples.

Second, most of the studies included in this review recruited female participants. Although females are most commonly diagnosed with eating disorders, more eating disorders are being identified in routine practice within male populations (Weltzin, 2018). Therefore, future research should explore eating disorder characteristics and fear of negative evaluation within male populations. Furthermore, as all studies were conducted in Western countries, the cross-cultural validity of the results is unclear.

Another limitation of the studies included in this review is related to the quality of reporting. All studies failed to report that a sample size calculation had been completed. Without this information, it was not possible to assess whether studies were appropriately powered (Nayak, 2010). When small sample sizes are recruited, and limited amounts of data are collected, any outlying data can negatively impact effect sizes and give inaccurate and misleading results (Adams & Lawrence, 2014; Nayak, 2010). Within this review, the study recruiting the smallest samples also reported the smallest effect sizes (Hinrichsen et al., 2003). Furthermore, this was one of the studies recruiting clinical samples. Therefore, it might be argued that the small sample size produced an inaccurate and misleading picture of the association between eating disorder characteristics and fear of negative evaluation within clinical samples.

Most studies included in the review used a cross-sectional design. Although cross-sectional designs are considered fast and inexpensive in comparison to other study designs, they increase the risk of uncontrolled, confounding variables (Salkind, 2010; Setia, 2016). The introduction of confounding variables can impact findings, and reduce generalisability of results (Kukull & Ganguli, 2012). Therefore, the risk of confounding variables should be considered when interpreting the findings of this review.

Furthermore, the cross sectional design of the studies in this review limits the ability to determine whether fear of negative evaluation is a causal factor for eating disorders (or vice versa) (Setia, 2016). Only one study gathered preliminary evidence regarding causal relations between fear of negative evaluation and eating disorder characteristics (DeBoer et al., 2013). Future research should employ experimental designs.

In summary, future studies exploring eating disorder characteristics and fear of negative evaluation should recruit clinical, gender varied samples, and use more robust research designs to explore causality. The reporting standards of studies (e.g., sample

selection, power calculations, controlling for confounding) should also be improved, to aid the interpretation of findings.

Critique of the review

This systematic review has a number of strengths. First, it is the first systematic review to explore the association between eating disorder characteristics and fear of negative evaluation. The review has given further insight into the association, which has enabled suggestions to be made for clinical practice and the prevention of eating disorders. Additionally, the systematic design of the review enhances replicability. Therefore, the review can be updated with new literature in the future.

Searching three databases identified a large number of papers, and following a rigorous selection process, 19 eligible papers were identified. Consequently, the review incorporated data from 3395 participants. Searching reference lists of included papers reduced the risk of missing further eligible papers. Measures of eating disorders and fear of negative evaluation used across the studies were all validated and reliable measures, consequently strengthening the overall findings of this review.

However, the review also has a number of limitations, which should be noted and taken into consideration when interpreting the findings. First, papers not written in English were excluded from the review. This exclusion might have resulted in eligible papers being missed. Additionally, grey literature (unpublished literature) was not searched, and this might have increased the risk of publication bias, with unpublished papers being missed (Rothstein & Hopewell, 2009).

Although the association between different eating disorder characteristics and fear of negative evaluation were explored as an aim of the review, the main focus of the review explored the association between eating disorder characteristics and fear of negative evaluation. Therefore, a transdiagnostic approach was employed. A transdiagnostic approach is suggested to be helpful for understanding factors that

connect different eating disorders, and allows the development of interventions that support individuals with a range of eating disorder presentations (Schleien, Dimitropoulos, Loeb, & Le Grange, 2017). Further, transdiagnostic approaches are suggested to reflect clinical realities (Schleien et al., 2017). However, the transdiagnostic approach has been criticized for ignoring differences between different eating disorders, such as anorexia and bulimia (Schleien et al., 2017).

The Down and Blacks quality checklist was used within this review. This checklist was chosen due to its ability to be adapted for different study designs. However, there are other tools that would have also been appropriate to assess the quality of the cross-sectional studies included in this review, such as the Newcastle Ottawa Scale or STROBE checklist. Further, the Downs and Black checklist does not provide guidance to determine the overall quality of studies following quality review. Therefore, the first author determined an arbitrary cut off score.

It should also be noted that the results of quality checklist are subject to the interpretation of the researcher, and therefore results can include bias. To reduce researcher bias within the quality assessment, a second reviewer was incorporated. However, one author conducted all other parts of the review. This included making the decisions related to database searching, selection of studies and data extraction. It is suggested that the reliability of such processes can be increased if more than one author is involved (Centre for Reviews and Dissemination [CRD], 2009). Future reviews should incorporate more than one reviewer throughout the full process.

Finally, simple mean effect sizes were calculated to synthesis the findings, and compare mean effect sizes of different groups (Dong, Maynard, & Perez-Johnson, 2008). However, the simple mean effect size does not take into consideration how precise individuals studies are, and does not give more weight to studies with more precision (Borenstein, Hedges, & Rothstein, 2007). To strengthen the findings, a future

review might consider using sample-size adjusted means, taking into consideration the precision of individual studies.

Conclusion

This review has systematically identified and evaluated the available evidence assessing the association between fear of negative evaluation and eating disorder characteristics. The results indicate that eating disorder characteristics are moderately strongly associated with fear of negative evaluation. Therefore, as well as being a cognitive feature of social anxiety, fear of negative evaluation appears to be a cognitive feature of eating disorders, whatever the causality of the linkage. This finding provides further understanding into the comorbidity between the disorders, and highlights opportunities for preventing, detecting and treating eating disorders. However, this finding is limited due to the cross-sectional nature of the current research base. Further research is needed to establish a causal pathway.

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Section Two: Research report

Using surveys to challenge ‘mindreading’ in relation to negative body image.

Abstract

Objective. Surveys are routinely used in clinical practice to improve body satisfaction. However, there is limited research evidence supporting this practice. Therefore, this study investigated the impact of survey feedback on body satisfaction and eating disorder characteristics, and examined whether individual characteristics impact responsiveness to feedback.

Design. A quantitative, experimental design was used to examine the impact of survey feedback on female, undergraduate students.

Method. Fifty-six participants were randomly assigned to one of three groups. Participants in the control group received survey feedback unrelated to appearance. In contrast, participants in the experimental groups received either moderate or strong survey feedback related to appearance. Outcome measures were completed pre and post feedback.

Results. Feedback unrelated to appearance significantly improved body satisfaction. In contrast, strong feedback related to appearance significantly increased body dissatisfaction. Eating attitudes were improved for the full sample. However, this effect was not dependent on the type of feedback received. Individual characteristics impacted responsiveness to feedback.

Conclusions. Survey feedback unrelated to appearance appears to be an effective technique for improving body satisfaction for non-clinical, female, undergraduate students. However, survey feedback related to appearance appears unhelpful or even negative. Potential reasons for these results are discussed, and clinical implications are outlined. Further research is required to understand the positive and negative effects of surveys.

Practitioner points:

- More strongly disconfirming survey feedback related to appearance can increase body dissatisfaction, and appears to be more unhelpful for individuals with greater body dissatisfaction and social anxiety.
- Survey feedback unrelated to appearance can improve body satisfaction, and appears to be more helpful for individuals with greater eating concerns.
- Survey feedback unrelated to appearance might be considered as a tool to improve body satisfaction, and prevent negative body image and eating disorders, within the general population.
- Further research should consider exploring the positive and negative effects of surveys, in clinical and non-clinical populations.

Introduction

Negative Body Image

Body image is defined as the picture a person forms in their mind about the appearance of their body, including what they believe others may think (Moe, 1999). Negative body image involves a perceptual element (i.e., body size overestimation) and a conceptual one - dissatisfaction with the appearance of one's body (Alleva, Sheeran, Webb, Martijn, & Miles, 2015). The latter is the focus of this research.

The development of negative body image is a common problem, especially among females in Western societies, and is associated with numerous psychological difficulties, such as low self-esteem, social anxiety and eating disorders (Grant & Cash, 1995; Paxton, Eisenberg, & Neumark-Sztainer, 2006; Strachen & Cash, 2002). Furthermore, body dissatisfaction is suggested to be one of the most consistent predictors of eating disorders in females. Therefore, improving body satisfaction is an important factor in the prevention and treatment of eating disorders (Kilpela, Black Becker, Wesley, & Stewart, 2015; Paxton & McLean, 2010).

Onset

The onset of body dissatisfaction differs across individuals. Body dissatisfaction can be shaped and influenced by multiple factors, such as the media, social norms and physical changes (Bailey & Waller, 2017; Grogan, 2002). Negative body image can be seen as early as primary school age, with children showing high levels of anxiety about their weight and physical appearance (Grogan, 2002; Hutchinson & Calland, 2011). However, for many people, issues around body image come to the foreground later, when it may be harder to locate and treat the original cause (Kilpela et al., 2015).

Body Dissatisfaction within Eating Disorders

As noted, body dissatisfaction is a consistent predictor for eating disorders. Various suggestions have been made to explain the link between body dissatisfaction

and eating disorders. For example, bullying is associated with both body dissatisfaction and eating disorder characteristics, and suggested to play a causal role in the development of both difficulties (Menzel, Schaefer, Burke, Mayhew, Brannick, & Thompson, 2010). It is also suggested that attentional bias to disliked body parts can reinforce weight and shape concern and negative body image, and contribute to eating difficulties and body dissatisfaction (Shafran, Lee, Cooper, Palmer, & Fairburn, 2007; Shuck, Munsch, & Schneider, 2015).

Further, sociocultural risk factors are suggested to impact the development of both body dissatisfaction and eating disorders, with peer and media influences being the strongest predictors (Shroff & Thompson, 2006). Thompson, Coover, and Stormer (1999) suggest a tripartite influence model, proposing that social influences from peers, parents and the media have a direct impact on the development of body dissatisfaction and the development of eating disorder characteristics (e.g., restrictive eating and bulimic behaviours). Clarke, Thompson, Jenkinson, Rumsey, and Newell (2013) also describe the importance of sociocultural factors (e.g., media, society, culture) on the development and maintenance of appearance-related anxiety. For example, cultural factors are suggested to influence core beliefs about appearance, and the media is suggested to play an important role in creating and exacerbate pressures for those who are distressed about their appearance (Clarke et al., 2013).

It is also suggested that meditational processes can impact the difficulties indirectly, such as the internalisation of societal standards of appearance (Thompson et al., 1999). For example, internalisation of the 'thin-ideal' body image can influence body dissatisfaction and lead to eating difficulties (Alleva, Martijn, Jansen, & Nederkoorn; Slevec & Tiggemann, 2011; Thompson & Stice, 2001).

Maintaining Factors

Within clinical practice, it is possible to explore and target factors maintaining body dissatisfaction (Bailey & Waller, 2017). Factors that might maintain negative body image include behaviours such as comparing and avoidance, and unhelpful and negative thought patterns such as catastrophising and ‘mind reading’ (Bell & Rushforth, 2008; Verplanken & Tangelder, 2011). For example, ‘mind reading’ becomes a maintaining factor for negative body image, when individuals assume others hold negative views about their appearance, but do not seek to test or challenge these assumptions (Bell & Rushforth, 2008; Collins-Donnelly, 2014). An example of ‘mind reading’ related to body image may be “I know they think I am fat, but they would never tell me”.

Interventions

A number of interventions have been developed to improve body image, with cognitive behavioural therapy (CBT) being the most effective model used in clinical practice (Alleva, Sheeran, et al., 2015). Interventions based on CBT principles are effective at improving body satisfaction in clinical and non-clinical samples, and have been found to simultaneously improve eating attitudes and behaviours (Jarry & Berardi, 2004). In the context of body image interventions, CBT encourages individuals to challenge and modify unhelpful thoughts, feelings and behaviours that may be maintaining negative body image (Alleva, Sheeran, et al., 2015).

Behavioural experiments are commonly used to break maintenance cycles, and this technique is considered to be a central feature for the success of CBT treatments (Bennett-Levy et al., 2004). However, past research specifically focusing on behavioural interventions has been limited, with studies tending to evaluate CBT packages in full rather than looking at specific strategies and change techniques (Bennett-Levy et al., 2004).

The lack of research evaluating specific intervention strategies has been reflected within the body image literature. It is argued that exploring specific treatment components is an important factor in developing effective and targeted interventions for negative body image (Jarry & Berardi, 2004).

A recent literature review by Alleva, Sheeran, et al. (2015) identified research exploring different body image interventions, and examined specific change techniques used within interventions. They were able to observe which specific intervention techniques effectively improved body image. The review highlighted 12 specific techniques associated with significant improvements in body image, which incorporated a number of CBT techniques. CBT techniques included monitoring and restructuring unhelpful thinking styles, and aspects of behavioural experiments. The review concluded that these change techniques should be explored further in future research. However, one technique that they were unable to test, given a lack of evidence to date, was the use of surveys.

Surveys

Surveys are a type of behavioural experiment, routinely used in clinical practice to monitor and challenge unhelpful thinking styles (e.g., ‘mind reading’). Clarke (2001) describes surveys a helpful way to test negative predictions, and reduced fear of negative evaluation from others. Survey’s are commonly used in clinical practice to address social anxiety, body dissatisfaction and appearance-related anxiety (Gowers & Green, 2009; Rosen, Saltzberg, & Srebnik, 1989). For example, if individuals have experienced physical injuries that have impacted their appearance (e.g., scars), surveys can be used to test patient’s beliefs about what others think about their appearance (Simos & Hofmann, 2013). Positive feedback from others (e.g., that they did not notice scars) is suggested to disconfirm patient’s beliefs and fears, and reduce appearance related anxiety.

When using surveys to treat negative body image, clients are asked to provide a photograph, and state what they believe others would say about their appearance. Other people are then asked to rate the photograph on the same characteristics, to determine whether the individual is correct in their assumptions about what those other people think of them ('mind reading'). In clinical settings, the outcome is that the client's belief about others' judgments is shown to be incorrect, and this challenging is associated with improvements in body image. Therefore, surveys allow clients to test the accuracy of their own beliefs regarding what others think about them (Waller et al., 2007). Although surveys are routinely used as an intervention in clinical settings to treat negative body image, there is limited experimental research supporting the effectiveness of this practice. Therefore, to promote evidence-based practice, the effectiveness of surveys as an intervention for improving body satisfaction needs exploring within an experimental study.

Furthermore, it is acknowledged that the effectiveness of psychological interventions can be impacted by individual characteristics (Turner, Holtzman, & Mancl, 2007). Therefore, if surveys are effective overall, it is important to understand whether individual characteristics are associated with how well individuals respond to survey feedback. This information would help direct future research and practice, and indicate who would be most likely to benefit from this type of intervention (Turner et al., 2007). In this study, the factors to be considered will be fear of negative evaluation (FNE), body mass index (BMI), anxiety, depression and self-esteem.

Summary

Given the routine use of surveys in clinical practice to improve body image and lack of research evidence supporting this practice, this study aims to investigate whether survey feedback can improve body satisfaction. Given the association between negative body image and eating disorders, this study will also explore the impact of survey

feedback on eating disorder characteristics. Additionally, it will examine whether individual characteristics influence how responsive someone is to survey feedback. The research will recruit females - a population at greater risk for developing negative body image and eating disorders.

The results of this study will start an evidence base for whether this type of behavioural experiment (i.e., surveys) is an effective way to help people gain a more positive body image.

Aims and Hypotheses

This study aims to answer the following questions:

1. Does feedback from a survey impact on someone's body image and eating attitudes, and does that impact depend on the nature of the feedback?
2. Do individual factors impact on how a person responds to feedback from a survey?

In order to answer these aims, the following hypotheses will be tested:

1. Positive survey feedback in relation to appearance will lead to a positive change in body image and eating attitudes, with more positive feedback being related to a greater change.
2. Those with more fear of negative evaluation (FNE), higher levels of anxiety and depression, lower self-esteem, and higher BMI will be less responsive to positive feedback from a survey.

Method

Design

This research explored the impact of positive survey feedback on body satisfaction and eating disorder characteristics among a non-clinical sample, and examined whether individual characteristics impacted responsiveness to survey

feedback. It used a quantitative, experimental design, with three independent groups (control, moderate feedback, and strong feedback) and repeated measures (pre- and post-survey feedback).

Ethical Considerations

Ethical approval was received from the University of Sheffield Ethics committee (see Appendix B). At the beginning of the process, participants were given information sheets regarding the research (see Appendix C) and invited to provide informed consent online if they wanted to participate (see Appendix D).

To minimize risk of distress, all participants were given survey feedback in a positive direction (i.e., all feedback was an improvement on participants' predictions), and fully debriefed at the end of participation (see Appendix E). Participants were provided with details for the University Health Service, and advised to access the service if they experienced any concerns as a result of participating in the study.

All data were captured online in a secure database. Participants were asked to create a personal identification number, which was inputted at each stage to link pre and post data. Participant photographs and email addresses were deleted following participation. All data were stored confidentially, and no contact details were exported into the final dataset.

Service user involvement

Members of Project HEAL, a service user-led charity supporting individuals with eating disorders through the recovery process, provided feedback that the research protocol was appropriate.

Participants

Sample Size. A sample size analysis was calculated for the main hypothesis (there would be a difference in impact between the different types of survey feedback) using G*Power (Faul et al., 2007). Assuming a small effect size ($f=0.20$), a p value of

0.05, and an alpha of 0.8, and given the presence of three groups and two measurement points, a total sample size of 66 would be necessary (G*Power 3.1: Faul et al., 2007). If the effect size proved to be stronger ($f=0.25$), a total sample size of 42 would be adequate.

Based on the small effect size ($f=0.20$), the study aimed to recruit 25 participants per group to allow for any loss of participants (up to 15% loss). The output from the G*Power analysis can be found in Appendix F.

Recruitment. Due to this being a new area of research, participants were recruited from a non-clinical population. First year undergraduate students were recruited from the University of Sheffield psychology program. Participants were recruited via an Online Participation Research Scheme system (OPRS), and given credits for participation (as per university protocol). Due to university term times and credit allocation procedures, participants were recruited over two periods (April-June 2017 and October-November 2017). Participants were invited to participate if they were over 18 years old, had a BMI over 18, and not currently receiving psychological therapy. Participants receiving psychological therapy were excluded from the study, as receiving psychological therapy from another source could influence the studies findings. Further, the study intervention might impact the therapy the individuals were receiving.

Additionally, to ensure there was room for change in body satisfaction and eating disorder characteristics following survey feedback, participant data were excluded from relevant analyses if they scored at the floor or ceiling levels on the Body Satisfaction Scale (BSS) or Eating Disorder-15 (ED-15) at baseline. Therefore, participants with minimum or maximum scores (i.e., 7 or 112 on the BSS, and 0 or 6 on the ED-15) would be excluded (see data analysis section for further information).

Randomisation. Each participant was randomly allocated to one of three groups. Group 1 formed the control group, and groups 2 and 3 formed the experimental groups. All participants completed the same procedure (see below for more details), with the difference being that the control group were asked to rate and send a photograph of a landscape, whereas the experimental groups were asked to rate and send a photograph of themselves.

The difference between groups 2 and 3 was the extent of positive survey feedback received. The moderate group received a 12% improvement on their predictions, and the strong group received a 25% improvement. These figures were chosen to reflect the extent of feedback received in clinical practice, and to ensure it remained realistic.

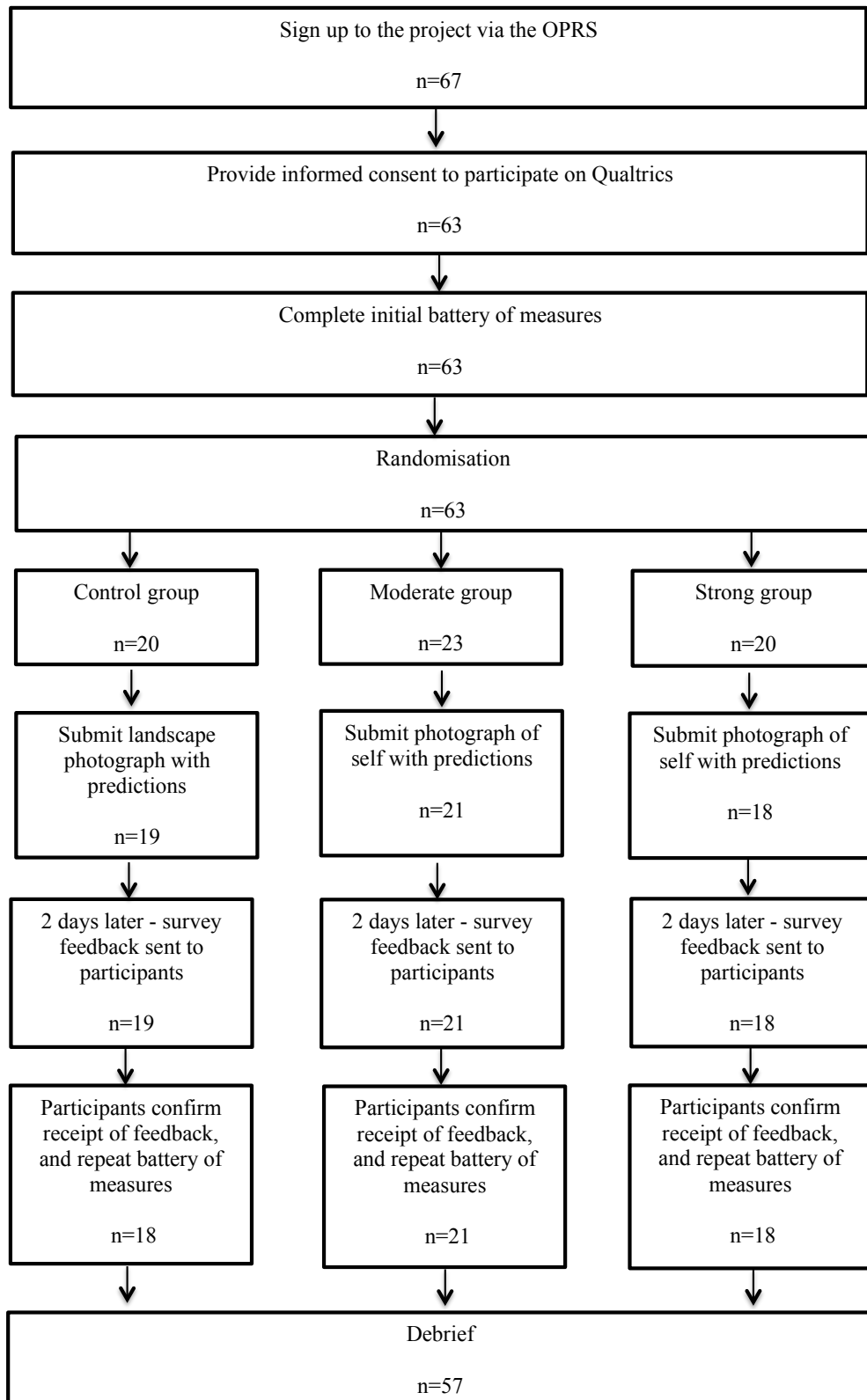
Procedure

The flow of recruitment and experimental procedures can be seen in Figure 1. Following signing up to the project through the OPRS, 67 participants were provided with a link to the online study on Qualtrics. Participants were asked to read an information sheet, and invited to provide informed consent to participate (see Appendix C & D).

Sixty-three participants gave consent to participate, and completed the initial battery of measures. In order to anonymise the data, participants created a unique identification code at the start, and inputted this at each stage of the process.

Following completion of the measures, participants were randomly allocated to one of three groups 1) control, 2) moderate feedback, 3) strong feedback. A random number list was generated and used to complete the randomisation process, and participants were blind to allocation. Participants were asked not to discuss the task with other potential participants.

Figure 1. Flow chart describing the recruitment process and experimental procedures.



Control group. Participants in the control group (n=20) were asked to email a photograph of a landscape to the research team. They were told a panel of judges would be rating the photograph, and asked to complete a standardised form to provide predictions regarding what they thought the judges would say about it (see Appendix G). Participants were informed the photograph would be deleted following completion of the study. One participant withdrew from the study at this stage. Therefore, 19 participants emailed a photograph and their predictions.

Two days later, participants received the survey feedback, which was manipulated to be a 25% improvement on their original ratings. After confirming receipt of feedback, participants were asked to complete the battery of measures again. One participant dropped out, leaving 18 participants completing the final measures. Each participant was debriefed and made aware the survey results were fictional.

Experimental groups. Participants allocated to receive moderate (n=23) or strong (n=20) feedback were asked to email a photograph of themselves to the research team. Both groups were told a panel of judges would be rating the photograph, and asked to complete a standardized form to provide predictions regarding what they thought the judges would say about their photograph (see Appendix H). They were informed the photograph would be deleted following completion of the study. Two participants from each group withdrew from the study at this stage. Therefore, 21 participants emailed a photograph and predictions from the 'moderate' group, and 18 from the 'strong' group.

Two days later, participants received the survey feedback. Group 2 received moderately positive feedback - a 12% improvement on their predictions, and group 3 received strongly positive feedback - a 25% improvement on their predictions. After confirming receipt of their feedback, participants were asked to complete the battery of measures again. All 21 participants completed the final measures in group 2, and all 18

in group 3. Once the final measures were completed, participants were debriefed and made aware the survey results were fictional.

Measures

All data were collected through Qualtrics, a secure online survey system. Participants were asked to provide their age, weight and height, and complete the following battery of measures on two occasions (pre and post survey feedback). A copy of each measure can be found in Appendix I.

1) **Body Satisfaction.** The Body Satisfaction Scale (BSS) (Slade et al., 1990). The BSS is a 16-item, self-report questionnaire measuring body dissatisfaction, with reasonably high internal consistency ($\alpha = 0.79 - 0.89$). The BSS produces a total score that incorporates all 16 items, and two further subscale scores (head dissatisfaction and body dissatisfaction). Higher scores on the BSS indicate more body dissatisfaction.

2) **Eating Attitudes.** The Eating Disorder-15 (ED-15) (Tatham et al., 2015). The ED-15 is a self-report measure of eating attitudes and behaviours, consisting of two scales 1) weight and shape concerns scale and 2) eating concerns scale. The test-retest reliability of the Weight & Shape Concerns scale is $r = 0.788$, and the test-retest reliability of the Eating Concerns scale is $r = 0.806$. The internal consistencies of the scales are both strong ($\alpha = 0.938$ and 0.802 , respectively). Higher scores on the ED-15 indicate higher levels of eating disorder characteristics.

Although Question 11 was excluded during the development of ED-15, it was included in this study as a standalone item to measure fear of uncontrollable weight gain.

3) **Fear of Negative Evaluation (FNE).** The Brief Fear of Negative Evaluation Scale (BFNE) (Leary 1983). The BFNE is a 12-item measure, used to determine the degree to which people experience fear of being negatively evaluated (a key element of

social anxiety). The scale has excellent test-retest reliability ($r = 0.94$) and excellent internal consistency ($\alpha = 0.97$). Higher scores on the BFNE indicate higher levels of social anxiety.

4) **Anxiety.** GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006). The GAD-7 is a 7 item self-report measure of anxiety, with good test-retest reliability (0.83) and internal consistency ($\alpha = 0.92$). Higher scores on the GAD-7 indicate higher levels of anxiety.

5) **Depression.** PHQ-9 (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 is a 9 item, self-report measure, of depression, with excellent test-retest reliability and internal consistency ($\alpha = 0.86 - 0.89$). Higher scores on the PHQ-9 indicate higher levels of depression.

6) **Self Esteem.** Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1965). The RSE is a 10 item, self-report measure, measuring both positive and negative feelings about the self, with excellent test-retest reliability ($r = 0.85 - 0.88$) and internal consistency ($\alpha = 0.77 - 0.88$). Higher scores on the RSE indicate higher self-esteem.

Data Analysis

Preparation. Once final measures were completed, data for participants who completed the study were transferred from Qualtrics to Microsoft Excel, and then into SPSS v.23 for analysis. No personal details were transferred into this data set.

Each participant's BMI was calculated using the reported age, height and weight using a BMI calculator (NHS, 2015). Pre and post questionnaire totals were calculated, including scale scores for the BSS and ED-15.

To address Hypothesis 2 (responsiveness to survey feedback), change scores were calculated for each repeated measure by subtracting the post score from the pre score. Positive change scores on the BSS, for example, would indicate an improvement in body satisfaction as a result of receiving survey feedback.

Floor and Ceiling Scores. To ensure there was room for change in body satisfaction and eating disorder characteristics following feedback, BSS and ED-15 baseline data were examined for floor and ceiling scores. If floor or ceiling scores were identified (i.e., 7 or 112 on the BSS, and 0 or 6 on the ED-15), they were removed from any analyses incorporating the specific baseline scores.

Following examination of the data, no data were excluded based on baseline BSS scores, as they ranged from 19 to 90. However, data were excluded due to floor and ceiling scores on baseline ED-15 scales.

In total, 5 participants data were excluded from analyses using ED-15 baseline scores. Within the control group, one participant scored at ceiling level on ED-15 WSC and one participant scored at floor level on ED-15 WSC. Within the moderate feedback group, one participant scored at floor level on ED-15 WSC. Within the strong feedback group, one participant scored at the ceiling level on all three scales, and a further participant scored at the ceiling level on the ED-15 EC.

Descriptive Statistics. To describe the sample at baseline, means and standard deviations were calculated for all baseline data (e.g., age, BMI and baseline scores on outcome measures) for the total sample, and each group separately. Mean scores for the total sample were compared to previously reported scores for clinical and non-clinical samples to establish the level of symptom severity within the current sample.

Distribution of data: To examine the distribution of the data, Shapiro Wilk tests were carried out on all data for each group. The results indicated that the majority of data were normally distributed; however small amounts of data were skewed. This information informed the decision regarding which statistical test to use to address each hypothesis.

Inferential Statistics. To examine any significant differences between groups at baseline, a series of one-way ANOVAs were completed to compare baseline

characteristics between groups. Although a small amount of baseline data were skewed, ANOVAs were used as they are considered to be robust, and not seriously impacted by skewed data (i.e., risks of type 1 and type 2 errors are not inflated) (Kirk, 2013; Norman & Streiner, 2007).

To address hypothesis 1, a series of 2x3 mixed ANOVAs were completed to compare any differences in BSS and ED-15 scores over time (within-subject factor) between the 3 groups (between-subject factor). To examine the significance of any pre-post change within each group, pairwise t-tests were also completed. Given the presence of normally distributed BSS and ED-15 scores, parametric tests were considered appropriate to use.

To address hypothesis 2, a series of Spearman's rho correlations were completed to assess associations between individual baseline characteristics and responsiveness to survey feedback (i.e. change scores on repeated measures). A non-parametric test was chosen due to the presence of some skewed data. Additionally, in light of the multiple correlation analyses, the alpha level was set to .01 to reduce the risk of type 1 errors.

Results

Baseline Characteristics

Table 1 presents baseline characteristics for the total sample and each group separately, along with results of a series of one-way ANOVAs examining any significant differences between groups at baseline.

Mean scores on BSS and ED-15 scales for the total sample were all lower than scores reported for clinical samples during validation of the measures, but higher than scores for non-clinical samples (Slade et al., 1990; Tatham et al., 2015). Mean BFNE scores were lower than scores reported for both clinical and non-clinical samples (Collins et al., 2005; Leary, 1983). Mean baseline GAD7 and PHQ9 scores indicated mild levels of anxiety and depression in the sample, and mean RSE scores were within

the range of ‘normal self-esteem’ (Kroenke, Spitzer, & Williams, 2001; Rosenberg, 1965; Spitzer, Kroenke, & Williams, 2006). ANOVA results indicate there were no significant differences between groups in terms of baseline characteristics.

TABLE 1. Participant baseline characteristics for the total sample and for each group, and a series of one-way ANOVAs comparing baseline characteristics between groups.

	Group								ANOVA	
	Total (n=57)		Control (n=18)		Moderate (n=21)		Strong (n=18)		F	p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Age (years)	19.00	1.36	19.33	1.97	18.81	0.75	18.89	1.18	0.798	.456
BMI	21.96	3.50	21.67	2.21	21.57	2.75	22.72	3.85	0.615	.545
BSS-Total	54.40	16.70	50.39	20.01	58.67	14.56	53.44	15.08	1.246	.296
BSS-Head	22.07	7.83	19.94	8.42	24.33	7.59	21.56	7.19	1.616	.208
BSS-Body	26.91	8.43	25.50	10.29	28.38	7.03	26.61	8.06	0.575	.566
ED15-Overall	2.62*	1.23*	2.61	1.38	2.54	1.12	2.74*	1.27*	0.118*	.889*
ED15-WSC	2.69*	1.37*	2.67*	1.56*	2.63*	1.23*	2.79*	1.42	0.190*	.827*
ED15-EC	2.58*	1.16*	2.47	1.05	2.61	1.18	2.66*	1.29*	0.122*	.886*
ED15-Q11	2.33	1.99	2.61	1.91	1.90	1.87	2.56	2.20	0.772	.467
BFNE	31.33	7.50	31.83	8.71	30.19	6.70	32.17	7.33	0.387	.681
GAD7	6.84	4.54	7.67	5.47	6.76	4.94	6.11	2.83	0.525	.595
PHQ9	7.67	5.26	8.67	6.32	6.76	4.87	7.72	4.60	0.630	.537
RSE	15.72	1.37	15.78	1.67	15.48	1.17	15.94	1.77	0.579	.564

Notes: SD = standard deviation; BSS = measure of body satisfaction, ED15 = measure of eating attitudes; WSC = weight and shape concern; EC = eating concern; BFNE = measure of fear of negative evaluation, GAD7 = measure of anxiety symptoms; PHQ9 = measure of depression symptoms; RSE = measure of self-esteem, F = statistic, p = level of significance.

* = Floor / ceiling data removed.

Hypothesis 1: Positive survey feedback about an individual’s body image will lead to positive changes in body satisfaction and eating disorder characteristics, with more positive feedback being related to greater changes.

Body Satisfaction. Table 2 presents pre and post BSS scores for each group. Pre and post BSS total scores were used to measure the impact of survey feedback on body satisfaction, with a lower score following feedback indicating an improvement in body satisfaction.

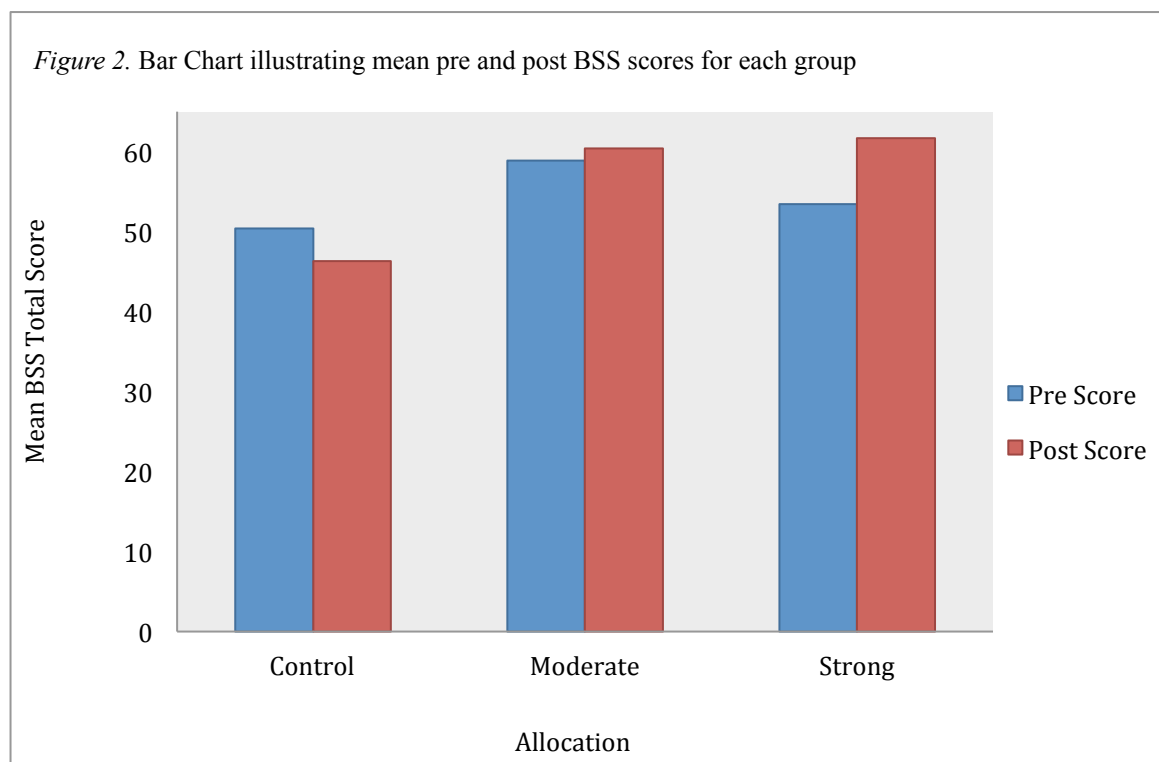
TABLE 2. Mean scores on the BSS and ED15 for each group, pre and post survey feedback.

	Control Group		Moderate Feedback		Strong Feedback	
	Pre (Mean, SD)	Post (Mean, SD)	Pre (Mean, SD)	Post (Mean, SD)	Pre (Mean, SD)	Post (Mean, SD)
BSS - Total	50.39 (20.01)	46.33 (19.87)	58.67 (14.56)	60.43 (15.35)	53.44 (15.08)	61.67 (24.37)
BSS - Head	19.94 (8.42)	19.28 (8.14)	24.33 (7.60)	25.62 (7.68)	21.56 (7.19)	26.39 (11.53)
BSS - Body	25.50 (10.29)	22.61 (10.24)	28.38 (7.03)	28.10 (7.71)	26.61 (8.06)	28.78 (11.24)
ED15 - Overall	2.61 (1.38)	2.36 (1.18)	2.54 (1.12)	2.27 (1.12)	2.74 (1.27)*	2.37 (1.28)*
ED15 - WSC	2.67 (1.56)*	2.39 (1.36)*	2.63 (1.23)*	2.43 (1.14)*	2.79 (1.42)*	2.45 (1.40)*
ED15 - EC	2.47 (1.05)	2.25 (.96)	2.61 (1.18)	2.19 (1.19)	2.66 (1.29)*	2.46 (2.25)*

Notes: SD = standard deviation; BSS = measure of body satisfaction, ED15 = measure of eating attitudes; WSC = weight and shape concern; EC = eating concern

* = Floor / ceiling data removed

As illustrated in Figure 2, the control group experienced an improvement in body satisfaction following survey feedback unrelated to appearance. In contrast, participants receiving moderate and strong survey feedback related to appearance experienced a decrease in body satisfaction.



A 2x3 Mixed ANOVA compared differences in BSS total scores before and after different types of survey feedback. Results indicated there was no significant main effect of time, $F(1,54) = 2.073, p = .156$, or group allocation, $F(2,54) = 2.152, p = .126$. However, there was a significant interaction between time and group allocation, $F(2,54) = 6.357, p = .003$, partial eta squared = .191.

Paired samples t-tests were conducted to examine the impact of survey feedback for each group separately. For those receiving moderate survey feedback, there was no significant difference between pre and post BSS total scores, $t(20) = .937, p = .360$. However, for those receiving strong survey feedback, there was a significant decrease in body satisfaction following feedback, $t(17) = 2.434, p = .026$. This indicates a medium effect ($d = 0.57$). Therefore, strong survey feedback appears to have a powerful effect, *decreasing* body satisfaction in a non-clinical sample. In contrast, participants in the control group experienced a significant improvement in body satisfaction following survey feedback unrelated to appearance $t(17) = 2.519, p = .022$. This indicates a medium effect ($d = 0.59$). Therefore, survey feedback unrelated to appearance appears to have a powerful effect, *increasing* body satisfaction in a non-clinical sample.

Eating Disorder characteristics. Table 2 presents pre and post ED-15 scale scores for each group. Pre and post ED-15 scores were used to measure the impact of survey feedback on eating disorder characteristics, with a lower score following feedback indicating a reduction in eating disorder characteristics. As previously noted, floor and ceiling baseline data were excluded from these analyses.

A series of 2x3 Mixed ANOVA compared differences in ED-15 scores before and after different types of survey feedback. Results indicated there was a significant main effect of time for all ED-15 scales (ED-15 Overall - $F(1,53) = 9.945, p = .003$, partial eta squared = .158; ED-15 WSC - $F(1,50) = 7.058, p = .011$, partial eta squared = .124; ED-15 EC - $F(1,53) = 8.494, p = .005$, partial eta squared = .139). However,

there was no significant main effect of group allocation, and no significant interaction between time and group allocation, for any ED-15 scales.

Therefore, there were significant changes in eating disorder characteristics over time for the full sample, however this change was not dependent on group allocation (i.e. nature of survey feedback given).

Summary: The findings related to body satisfaction do not support Hypothesis 1. First, they indicate that giving participants positive survey feedback related to appearance can have a negative impact on body satisfaction. Second, they suggest receiving survey feedback unrelated to appearance is significantly better at improving body satisfaction than strong survey feedback related to appearance. Therefore, the findings suggest survey feedback related to appearance should not be used as a method to improve body satisfaction in a non-clinical population.

In relation to eating disorder characteristics, results partially support Hypothesis 1. For the full sample, eating disorder characteristics was improved over time. However, this change was not dependent on the nature of survey feedback given.

Hypothesis 2: Those with higher scores on baseline measures (e.g. FNE, anxiety, depression, low self-esteem, BMI, body dissatisfaction, eating disorder characteristics) will be less responsive to positive feedback from a survey.

A series of Spearman's rho correlations were completed for each group to assess whether scores on baseline measures were associated with responsiveness to survey feedback. Responsiveness to feedback was measured by calculating pre-post change scores for repeated measures. Significant negative correlations (i.e., high scores on baseline measures associated with negative change scores) would support Hypothesis 2.

Due to multiple analyses, and increased risk of type 1 error, $p < .01$ was required to reach statistical significance. Additionally, data were excluded from relevant correlations if participants scored at the floor or ceiling on ED-15 scales at baseline.

Control group: As illustrated in Table 3, there were no significant negative correlations for the control group. However, there was one significant positive correlation. This indicates a higher score on a baseline measure was associated with positive outcomes following survey feedback.

There was a significant association between higher baseline ED-15 EC scores and reduced levels of overall eating disorder characteristics following survey feedback. Therefore, survey feedback unrelated to appearance had a more positive impact on individuals with more eating concerns, as they experienced greater reductions in eating disorder characteristics following feedback.

TABLE 3: Correlations (Spearman's rho) between baseline scores and changes in body satisfaction, eating disorder characteristics and FNE following survey feedback unrelated to appearance.

	Baseline Scores											
	BMI	GAD	PHQ	BFNE	RSE	BSS Total	BSS Head	BSS Body	ED15 Overall	ED15 WSC (n=16)	ED15 EC	ED15 Q11
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
<u>Change Scores</u>												
BSS Total	-.15	-.10	-.01	-.09	.27	.11	.22	.20	.01	.05	-.10	.07
BSS Head	-.24	.09	.13	.16	.21	.18	.35	.17	.22	.15	.06	.15
BSS Body	-.03	-.28	-.04	-.20	.39	.08	-.18	.10	-.17	-.04	-.10	-.17
ED15 Overall	.35	.21	.25	.23	-.28	.25	.15	.25	.51*	.17	.60**	.33
ED15 WSC (n=16)	.25	.11	.39	.40	-.26	.39	.25	.35	.51*	.48	.48	.31
ED15 EC	.43	-.04	-.18	-.30	-.06	-.27	-.30	-.28	.00	-.31	.42	-.14
BFNE	.20	.55*	.45	.50*	-.55*	.24	.22	.20	.48*	.42	.42	.55*

Notes: BSS = measure of body satisfaction, ED15 = measure of eating attitudes; WSC = weight and shape concern; EC = eating concern; BFNE = measure of fear of negative evaluation, GAD7 = measure of anxiety; PHQ9 = measure of depression; RSE = measure of self-esteem; *r* = Spearman's rho correlation; * = correlation significant at .05 level; ** = correlation significant at .01 level.

n=16 = 2 participants floor or ceiling data removed from analyses.

Moderate feedback: As presented in Table 4, there were patterns of significant negative correlations for the group receiving moderate feedback. This indicates higher scores on baseline measures were associated with negative outcomes following moderate survey feedback.

There were patterns of associations between higher baseline BSS scores (total and head) and increased levels of social anxiety and eating concerns following survey feedback. Therefore, moderate survey feedback related to appearance had a more negative impact on individuals with higher levels of body dissatisfaction, as they experienced increased levels of social anxiety and eating concerns following feedback.

TABLE 4: Correlations (Spearman's rho) between baseline characteristics and changes in body satisfaction, eating disorder characteristics and FNE following moderate survey feedback.

	BMI	GAD	PHQ	BFNE	Baseline Scores				ED15 Overall	ED15 WSC (n=20)	ED15 EC	ED15 Q11
					RSE	BSS Total	BSS Head	BSS Body				
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Change Scores												
BSS Total	-.15	-.05	-.30	-.34	-.28	.23	.29	.02	-.07	-.06	-.03	.17
BSS Head	-.24	-.02	-.22	-.26	-.20	.10	.25	-.23	.10	.07	.12	.08
BSS Body	-.03	-.05	-.18	-.34	.00	.05	.08	.05	.03	-.01	.11	.25
ED15 Overall	.35	-.36	-.08	-.22	-.05	-.48*	-.49*	-.34	.30	.21	.30	.29
ED15 WSC (n=20)	.16	-.41	.01	.03	-.15	-.34	-.34	-.27	.46*	.45*	.25	.49*
ED15 EC	.43	-.28	-.12	-.20	-.08	-.57**	-.58**	-.39	.12	.00	.33	.12
BFNE	.20	-.20	-.29	.32	-.20	-.48*	-.64**	-.26	.07	.20	.16	.53*

Notes: BSS = measure of body satisfaction, ED15 = measure of eating attitudes; WSC = weight and shape concern; EC = eating concern; WSC = weight and shape concern; EC = eating concern; BFNE = measure of fear of negative evaluation, GAD7 = measure of anxiety; PHQ9 = measure of depression; RSE = measure of self-esteem; *r* = Spearman's rho correlation; * = correlation significant at 0.05 level; ** = correlation significant at 0.01 level.

n=20 = 1 participants ceiling data removed from analyses

Strong feedback: As presented in Table 5, there was one significant negative correlation for the group receiving strong feedback. This indicates a higher score on a baseline measure was associated with negative outcomes following strong survey feedback.

There was an association between higher baseline BFNE scores and increased levels of body dissatisfaction (specifically head) following survey feedback. Therefore, strong survey feedback related to appearance had a more negative impact on individuals with higher levels of social anxiety, as they experienced increased levels of body dissatisfaction following feedback.

TABLE 5: Correlations (Spearman's rho) between baseline characteristics and changes in body satisfaction, eating disorder characteristics and FNE following strong survey feedback.

	BMI	GAD	PHQ	BFNE	Baseline Scores				ED15 Overall (n=17)	ED15 WSC (n=17)	ED15 EC (n=17)	ED15 Q11
					RSE	BSS Total	BSS Head	BSS Body				
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Change Scores												
BSS Total	-.15	-.05	-.29	-.53*	.25	-.43	-.59*	-.24	-.17	-.26	-.07	.08
BSS Head	-.24	-.02	-.39	-.67**	.22	-.45	-.47*	-.37	-.30	-.35	-.21	-.03
BSS Body	.03	-.05	-.10	-.29	.25	-.35	-.44	-.19	-.10	-.25	.01	.10
ED15 Overall (n=17)	.15	-.40	-.20	-.15	.12	-.21	-.38	-.07	.144	.02	.34	.11
ED15 WSC (n=17)	.39	-.44	-.28	-.03	.21	-.31	-.46	-.10	.35	.25	.37	.35
ED15 EC (n=17)	-.09	-.36	.02	.03	-.08	-.00	-.15	.09	.09	-.06	.38	.20
BFNE	.20	-.20	-.08	-.04	.31	-.25	-.47	-.03	.11	-.03	.28	.31

Notes: ED-15 Overall ceiling data removed; BSS = measure of body satisfaction, ED15 = measure of eating attitudes; WSC = weight and shape concern; EC = eating concern; WSC = weight and shape concern; EC = eating concern; BFNE = measure of fear of negative evaluation, GAD7 = measure of anxiety; PHQ9 = measure of depression; RSE = measure of self-esteem; *r* = Spearman's rho correlation; * = correlation significant at 0.05 level; ** = correlation significant at 0.01 level.

n=17 = 1 participants ceiling data removed from analyses

Summary: The results partially support Hypothesis 2. Participants reporting higher scores on baseline measures (e.g. social anxiety and body dissatisfaction) were less responsive to survey feedback related to appearance (i.e. feedback increased levels of social anxiety, eating concerns and body dissatisfaction). However, within the control group, participants reporting higher scores on baseline measures (e.g. eating concerns) had a more positive response to survey feedback unrelated to appearance (i.e., feedback reduced levels of eating disorder characteristics).

Therefore, survey feedback *unrelated* to appearance can be helpful for participants with higher baseline scores, whereas survey feedback related to appearance can be unhelpful for participants with higher baseline scores. Specifically, participants with higher levels of eating concern had a positive response to survey feedback unrelated to appearance. Therefore, surveys may be a useful tool for reducing eating

disorder characteristics within a non-clinical population, but that potential value needs to be balanced against the negative impact of strong feedback on body image.

Discussion

This experimental study examined the impact of survey feedback on body satisfaction and eating attitudes. Specifically, it examined the impact of different types of survey feedback (i.e., feedback related and unrelated to appearance) delivered at different levels of intensity, and whether individual characteristics influenced responsiveness to survey feedback. This discussion will summarise the main findings, and consider findings in relation to existing literature and theory. Limitations of the study will also be discussed. Finally, recommendations for future research will be made, along with clinical implications.

Summary of Main Findings

This study adds the first evidence to the research literature in relation to using surveys as a tool to improve body image and eating attitudes in a non-clinical population. Thus, a gap in the literature has been addressed by assessing the effectiveness of a specific CBT technique.

The findings of this study only partially support the effectiveness of surveys for improving body image and eating attitudes. Eating attitudes were significantly improved over time for the full sample, but this improvement was not dependent on the type of feedback received. Body satisfaction was significantly influenced by survey feedback, and this improvement was dependent on the nature of feedback given, though not in the anticipated way.

Survey feedback unrelated to appearance significantly improved body satisfaction, indicating this method might be used to improve body satisfaction within a non-clinical population. In contrast, strong positive survey feedback related to appearance significantly increased body dissatisfaction. This latter finding challenges

the effectiveness of surveys for improving body satisfaction. Although this finding cannot be generalised to a clinical population, the efficacy of using surveys in clinical practice has been questioned.

A number of individual characteristics were associated with responsiveness to survey feedback. Participants with greater body dissatisfaction and higher levels of social anxiety had a more negative response to feedback related to appearance. In contrast, participants with greater eating concerns had a more positive response to feedback unrelated to appearance. These findings support suggestions that individual characteristics can impact the effectiveness of interventions (Turner, Holtzman, & Mancl, 2007).

Findings in relation to existing literature and theory.

Why did strong survey feedback related to appearance increase body dissatisfaction?

Participants in the experimental groups received either moderate or strong survey feedback related to their appearance. Unexpectedly, strong survey feedback significantly increased body dissatisfaction. Possible explanations for this finding will be explored.

Cognitive-behavioural theory. First, cognitive-behavioural theory will be applied as a possible understanding for the unexpected finding of this study.

Cognitive-behavioural theory suggests individuals hold body image schemas, which incorporate beliefs, thoughts and feelings about appearance (Levine & Smolak, 2006). It is suggested that body image schemas are activated by a variety of situations (e.g., appearance-related feedback from others), and such activation generates thoughts, feelings and internal dialogues regarding how individuals look and feel (Cash, 2011; Levine & Smolak, 2006). Body image schemas can impact how appearance-related information is processed, with negative body image schemas activating negative emotions (Hrabosky & Cash, 2007).

Considering this study, it may be suggested that strong survey feedback related to appearance activated participant's body image schemas. The activation of body image schemas may have triggered negative thoughts and conclusions about body image, increasing participant's body dissatisfaction as a result (Cash, 2011).

Objectification theory. Objectification theory has been used to understand associations between appearance-related commentary and body dissatisfaction (Herbozo et al., 2017). Therefore, this theory will be applied as another possible understanding for the unexpected finding of this study.

Objectification theory proposes that women in Western societies are routinely evaluated and valued based on appearance (Alleva, Martijn, Van Breukelen, Jansen & Karos, 2015). Consequently, appearance-based evaluations can make women view themselves as objects to be judged (Calogero, Herbozo, & Thompson, 2009). When women experience objectification, they begin to engage in self-objectification and evaluate their own body based on appearance (Alleva, Martijn, et al., 2015). Self-objectification can lead to serious consequences, such as negative body image, anxiety, and disordered eating (Alleva, Martijn, et al., 2015; Frederickson & Roberts, 1997).

Within this study, participants in the experimental groups had their appearance judged. Therefore, it may be suggested participants were made to feel objectified, which increased self-objectification. Self-objectification may have encouraged participants to judge their own appearance, consequently increasing body dissatisfaction. As proposed by Alleva, Martijn, et al (2015), body image interventions should consider incorporating methods for reducing self-objectification (e.g., focusing on body functionality).

Individual characteristics. Individuals with greater body dissatisfaction and higher levels of social anxiety had a more negative response to feedback related to appearance. Possible explanations for this finding will be explored.

It is suggested that social anxiety and negative body image are maintained by

similar unhelpful cognitive patterns - negative self-perception and distorted views of self (Aderka, Gutner, Lazarov, Hermesh, Hofmann, & Marom, 2014). In addition, individuals with negative feelings about themselves are less likely to incorporate positive feedback into self-perception (Mori & Morey, 1991). Therefore, survey feedback may have been less helpful for participants with higher levels of body dissatisfaction and social anxiety, due to participants having negative and distorted views of self.

Source of feedback. The effectiveness of appearance-related feedback can be impacted by the source of that feedback. Goldsmith and Byers (2016) noted that positive feedback about appearance can improve body image. However, they concluded body satisfaction is improved when positive feedback is given from a partner, but not from a stranger. Therefore, it is important to reflect on the source of feedback, not just the impact of feedback. The source of feedback should be considered in relation to the findings in this study. The effect of the feedback may have been impacted due to it coming from strangers.

Therapeutic alliance. Another factor to consider in relation to the findings is therapeutic alliance. It is acknowledged that individuals take personal risks in behavioural experiments (i.e., having their appearance judged) (Cooper, Whitehead, & Boughton, 2004). Therapeutic assistance is considered important when interventions are personally and emotionally demanding (Jarry & Cash, 2011; Strachan & Cash, 2002). Furthermore, the absence of therapist contact is suggested to hinder changes in body image during interventions (Strachan & Cash, 2002). Therefore, absence of a therapist should also be considered when interpreting the findings of this study. Within clinical practice, the addition of a therapist may act as a moderating factor for using survey feedback effectively.

Why did feedback unrelated to appearance improve body satisfaction?

Survey feedback unrelated to appearance improved body satisfaction, and this was another unexpected finding. Possible explanations for this finding will be explored.

Testing judgment accuracy. It may be suggested that survey feedback unrelated to appearance improved body satisfaction by encouraging participants to challenge and test their judgment accuracy. Misjudgment and misperception are common within individuals with negative body image and eating difficulties (Tremblay & Limbos, 2009). Furthermore, challenging misjudgments and misperceptions are suggested to be effective techniques within eating disorders interventions.

Within this study, receiving survey feedback allowed participants to test how accurate they are at judging what other people think. Through manipulation of feedback, participants were encouraged to see they are not always accurate judges. Therefore, feedback challenged participant judgment accuracy.

It can be suggested that body satisfaction was improved by allowing participants to consider and test whether they are good at judging things. Through seeing they can misjudge, participants appear to have made more positive judgments about their own body image. Furthermore, this process was more effective for individuals with greater eating concerns (i.e., a population more likely to misperceive and misjudge). However, the nature of feedback is an important factor. Testing the accuracy of judgments directly related to appearance did not have the same result.

Cognitive-behavioural theory. As previously noted, activated body image schemas can trigger negative thoughts and feelings about body image. As participants in the control group received feedback unrelated to appearance, it is unlikely body image schemas were activated. Therefore, the control group might have experienced a more positive response, as feedback did not trigger negative thoughts and feelings about body image. Within a non-clinical population, it might be argued that survey feedback is only

effective at increasing body satisfaction when negative body schemas are not activated.

Limitations of the current research

It is important to acknowledge limitations of this study, which could limit the interpretability and the generalisability of the findings. First, recruiting a sample of undergraduate, female psychology students restricts the generalisability of the findings. Generalisability would have been increased by recruiting a sample more representative of the wider population (e.g., men and women, spanning a wider age range). Furthermore, recruiting a non-clinical sample has impacted the generalisability of the findings to clinical settings. However, a non-clinical sample was considered appropriate given the absence of previous research exploring the effectiveness of surveys.

It is a further limitation that data were not collected on patient ethnicity. The impact of appearance-related feedback can be moderated by ethnic background (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Women of non-white ethnic backgrounds are more likely to experience a negative impact if feedback represents Western society ideals of attractiveness (Thompson et al. 1999). Given the diversity of female, undergraduate students, participant ethnicity might be an important factor to consider when interpreting the findings.

Volunteer bias can be problematic when researching sensitive topics, and if present such bias can challenge the external validity of findings (Boughner, 2010). The study used an opportunity sampling method, recruiting participants through an online system. Four participants who initially showed interest in the study did not consent to participate after reading the information sheets. Specific factors may have influenced decisions regarding participation, and volunteer bias may have been introduced.

In addition, six participants dropped out of the study after randomisation. Although dropout was equal across groups, baseline data from these participants were excluded from analyses. Within intent to treat analysis (ITT), data from all randomised

participants are included in analyses (Gupta, 2011). However, a decision was made not to use ITT. ITT is criticized for being too cautious and open to type 2 errors (Gupta, 2011). It is suggested doing ITT, and including participants who do not receive interventions, dilutes estimates of effectiveness (Gupta, 2011). Therefore, including participants who dropped out would indicate little about the effectiveness of surveys.

A number of self-report measures were used within this study. The inclusion of self-report measures is suggested to increase risk of response bias, with participants giving socially desired answers (Van de Mortel, 2008). Therefore, the risk of socially desired responses should also be taken into consideration when examining the validity of the results.

Due to barriers faced during recruitment (e.g., university term times, allocating credits to researchers), the final sample size recruited was slightly lower than initially aimed for. Therefore, this study was underpowered, and results may incorporate errors as a result (Nayak, 2010). Furthermore, the original sample size calculation was based on the studies main hypothesis and Mixed ANOVAs. Therefore, the study was underpowered for correlation analyses. It is possible some correlations were non-significant due to the limited sample size. Therefore, results of all analyses should be treated as exploratory and interpreted with caution.

In addition, floor and ceiling baseline data were excluded from analyses. These data were excluded to ensure change in body satisfaction and eating disorder characteristics could be detected. However, removing this data reduced the sample size further. To test the impact of removing this data, analyses were run with floor and ceiling data included. Removing data did not impact the results for the main hypotheses.

Participants were randomly allocated to one of three groups (two experimental groups and one control group). To make the experimental and control groups more comparable, it would have been helpful to have two control groups receiving different

strengths of feedback (i.e., as per the experimental groups). A simple randomisation method was used to allocate participants (i.e., random number list). However, due to a relatively small sample size, this method created unequal numbers of participants among groups (Suresh, 2011).

The procedures implemented were designed to reflect clinical practice. For example, 12% and 25% improvements on initial predictions were chosen to ensure feedback remained realistic. Similarly, a two-day gap between making predictions and receiving feedback was considered an appropriate amount of time to seek feedback. However, these figures were not based on existing research. Choosing different intensities of feedback, and different amounts of time between predictions and feedback, might have impacted the findings.

Finally, it should be noted within pre-post studies, there is no control over other factors changing at the same time as the intervention is implemented (Thiese, 2014). Therefore, changes in body satisfaction during the study period cannot be fully attributed to the survey feedback.

Recommendations for Future Research

If the current study were replicated, a larger, more representative sample should be recruited (e.g., men and women of a wider age range, with clearly defined ethnicities). Additionally, a non-student population should be used, to ensure generalisability. Correlations between individual characteristics and responsiveness to survey feedback should be repeated, with a sufficiently powered sample size. Repeating these analyses would aid understanding regarding who is most likely to benefit from surveys as an intervention. In addition, the association between ethnicity and responsiveness to feedback should be explored.

To make the control and experimental groups more comparable, two control groups should be recruited. Also, the impact of different feedback intensities should be

considered, along with different lengths of time between making predictions and receiving feedback. Finally, a planned follow-up should be included to explore whether survey feedback has lasting impacts on body image and eating attitudes.

The application of survey feedback unrelated to appearance should be explored within a clinical population. Specially, given the evidence suggesting survey feedback unrelated to appearance was more helpful for those with greater eating concerns, general feedback on judgments might be explored in such research.

Future research should consider the role of a therapist when using surveys related to appearance. For example, feedback could be presented face-to-face to replicate a clinical scenario, rather than giving feedback anonymously. Additionally, the impact of different sources of feedback should be explored. For example, the impact of feedback from strangers should be compared with feedback from partners and other relations. Finally, the impact of reducing self-objectification when using survey techniques should be explored. Given the negative impact of survey feedback related to appearance, further exploration should be done with non-clinical samples in the first instance.

Clinical Implications

Improving body satisfaction is an important factor in the prevention and treatment of eating disorders and negative body image (Kilpela et al., 2015; Paxton & McLean, 2010). The findings of this study indicate that strong survey feedback related to appearance can increase body dissatisfaction. In contrast, survey feedback unrelated to appearance can improve body satisfaction. The clinical implications of these findings will be discussed.

When assessing a client with eating problems, clinicians should explore body satisfaction. If body dissatisfaction is identified, a formulation should be developed to understand the history of the problem, maintaining factors, and any co-morbid

difficulties. This formulation should be used to inform whether surveys are likely to be an effective intervention. For example, survey feedback related to appearance might be more unhelpful if clients have negative body image schemas or distorted views of self, if they engage in self-objectification, or if they have comorbid social anxiety. The addition of a therapist, or reducing self-objectification, might improve the effectiveness of such feedback. However, more research is needed to support these considerations, and survey feedback related to appearance should be used with caution. In contrast, survey feedback unrelated to appearance may be more helpful if misjudgment is a maintaining factor for the client's body dissatisfaction, or if clients report greater eating concerns. If surveys are used in clinical practice, the effectiveness of the intervention should be evaluated. Outcome measures (e.g., BSS and ED-15) should be completed before and after the intervention.

In addition to being used as an intervention tool in clinical practice, surveys should also be considered as a preventative tool within the general population. Through improving body satisfaction within non-clinical populations, negative body image and eating disorders might be prevented.

Conclusion

This is the first experimental research investigating the use of surveys for improving body image and eating attitudes. Survey feedback unrelated to appearance appears to be an effective technique for improving body satisfaction for non-clinical, female, undergraduate students. However, survey feedback related to appearance appears to have a negative effect, increasing body dissatisfaction. Potential reasons for these results have been discussed, and clinical implications have been outlined. However, further research is required to understand the positive and negative effects of surveys.

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Appendix A

Modified Downs and Black (1998) checklist

	Checklist Item	Score	Guidance
1	Is the hypothesis/aim/objective of the study clearly described?	0=no 1=yes	
2	Are the main outcomes to be measured clearly described in the introduction or methods section?	0=no 1=yes	If the main outcomes are first mentioned in the Results section, the question should be answered no.
3	Are the characteristics of the patients included in the study clearly described?	0=no 1=yes	In cohort studies and trials, inclusion and/or exclusion criteria should be reported. In case-control studies, a case-definition and the source for controls should be provided.
4	Are the interventions of interest clearly described?	0=no 1=yes	Treatments and placebo (where relevant) that are to be compared should be clearly described.
5	Are the distributions of principal confounders clearly described?	0=no 1=partially 2=yes	A list of principal confounders is provided.
6	Are the main findings of the study clearly described?	0=no 1=yes	Simple outcome data (including denominators and numerators) should be reported for all major findings so that the reader can check the major analyses and conclusions. (This question does not cover statistical tests that are considered below).
7	Does the study provide estimates of the random variability in the data for the main outcomes?	0=no 1=yes	In non-normally distributed data, the inter-quartile range of results should be reported. In normally distributed data, the standard error, standard deviation, or confidence intervals should be reported. If the distribution of the data is not described, it must be assumed that the estimates used were appropriate and the question should be answered yes.
8	Have all important adverse events that may be a consequence of the intervention been reported?	0=no 1=yes	This should be answered yes if the study demonstrates that there was a comprehensive attempt to measure adverse events. (A list of possible adverse events is provided).
9	Have the characteristics of patients lost to follow-up been described?	0=no 1=yes	This should be answered yes where there were no losses to follow-up or where losses to follow-up were so small that findings would be unaffected by their inclusion. This should be answered no where a study does not report the number of patients lost to follow-up.
10	Have actual probability values been reported (e.g., 0.035 rather than <0.05) for the main outcomes, except where the probability value	0=no 1=yes	If no p values are presented, the question should be answered 'no'. If p values presented and there is a mixture of reporting (some presented

	is <0.001?		as < or > specific figures, some as equality, e.g. p = 0.034), question should be answered 'yes'.
11	Were the subjects asked to participate in the study representative of the entire population from which they were recruited?	0=no 0=unable to determine 1=yes	The study must identify the source population for patients and describe how the patients were selected. Patients would be representative if they comprised the entire source population, an unselected sample of consecutive patients, or a random sample. Random sampling is only feasible where a list of all members of the relevant population exists. Where a study does not report the proportion of the source population from which the patients are derived, the question should be answered as unable to determine.
12	Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	0=no 0=unable to determine 1=yes	The proportion of those asked and agreed to participate should be stated. Validation that the sample was representative would include demonstrating that the distribution of the main confounding factors was the same in the study sample and the source population.
13	Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive?	0=no 0=unable to determine 1=yes	For the question to be answered yes the study should demonstrate that the intervention was representative of that in use in the source population. The question should be answered no if, for example, the intervention was undertaken in a specialist centre unrepresentative of the hospitals most of the source population would attend.
14	Was an attempt made to blind study subjects to the intervention they have received?	0=no 0=unable to determine 1=yes	For studies where the patients would have no way of knowing which intervention they received, this should be answered yes.
15	Was an attempt made to blind those measuring the main outcomes of the intervention?	0=no 0= unable to determine 1=yes	
16	If any of the results of the study were based on "data dredging," was this made clear?	0=no 0=unable to determine 1=yes	Any analyses that had not been planned at the outset of the study should be clearly indicated. If no retrospective unplanned subgroup analyses were reported, then answer yes.
17	In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and	0=no 0=unable to determine 1=yes	Where follow-up was the same for all study patients the answer should be yes. If different lengths of follow-up were adjusted for by, for example, survival analysis the answer should be yes. Studies where differences in follow-up are ignored should be answered no.

	controls ?		
18	Were the statistical tests used to assess the main outcomes appropriate?	0=no 0=unable to determine 1=yes	The statistical techniques used must be appropriate to the data. For example nonparametric methods should be used for small sample sizes. Where little statistical analysis has been undertaken but where there is no evidence of bias, the question should be answered yes. If the distribution of the data (normal or not) is not described it must be assumed that the estimates used were appropriate and the question should be answered yes.
19	Was compliance with the intervention/s reliable?	0=no 0=unable to determine 1=yes	Where there was non compliance with the allocated treatment or where there was contamination of one group, the question should be answered no. For studies where the effect of any misclassification was likely to bias any association to the null, the question should be answered yes.
20	Were the main outcome measures used accurate (valid and reliable)?	0=no 0=unable to determine 1=yes	For studies where the outcome measures are clearly described, the question should be answered yes. For studies that refer to other work or demonstrates the outcome measures are accurate, the question should be answered as yes.
21	Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population?	0=no 0=unable to determine 1=yes	For example, patients for all comparison groups should be selected from the same hospital. The question should be answered unable to determine for cohort and case- control studies where there is no information concerning the source of patients included in the study.
22	Were study subjects recruited over the same period of time?	0=no 0=unable to determine 1=yes	For a study which does not specify the time period over which patients were recruited, the question should be answered as “unable to determine.”
23	Were study subjects randomised to intervention groups?	0=no 0=unable to determine 1=yes	Studies which state that subjects were randomised should be answered yes except where method of randomisation would not ensure random allocation. For example alternate allocation would score no because it is predictable.
24	Was the randomised intervention assignment concealed from both patients and health care staff until recruitment was complete and irrevocable?	0=no 0=unable to determine	All non-randomised studies should be answered no. If assignment was concealed from patients but not from staff, it should be answered no.

		1=yes	
25	Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	0=no 0=unable to determine 1=yes	If the effect of the main confounders was not investigated or confounding was demonstrated but no adjustment was made in the final analyses, the question should be answered as no.
26	Were losses of patients to follow-up taken into account?	0=no 0=unable to determine 1=yes	If the numbers of patients lost to follow-up are not reported, the question should be answered as unable to determine. If the proportion lost to follow-up was too small to affect the main findings, the question should be answered yes.
27	Was a sample size calculation completed?	0=no 1=yes	

Appendix B

Ethical Approval



Downloaded: 21/03/2017 Approved: 13/03/2017

Glenn Waller Psychology

Dear Glenn

PROJECT TITLE: Using surveys to challenge mindreading distortions in relation to negative body image

APPLICATION: Reference Number 012259

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 13/03/2017 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

University research ethics application form 012259 (dated 11/03/2017). Participant information sheet 1025668 version 2 (11/03/2017). Participant consent form 1025669 version 2 (11/03/2017).

If during the course of the project you need to **deviate significantly from the above-approved documentation** please inform me since written approval will be required.

Yours sincerely

Thomas Webb Ethics Administrator Psychology

Appendix C

Participant information sheet

Understanding Body Image

This project aims to investigate the accuracy of our beliefs about what other people think. The study will involve you providing a photo, and providing your beliefs about how others will rate it. Your ratings will then be compared with those of a panel of individuals who do not know you.

We would like to invite you take part in this project. By taking part, we would be asking you to:

- Now - complete some questionnaires online, followed by a short task which will require emailing a photograph to the study team. We will then ask you to provide your predictions about what a panel of people will say about the photograph.
- Two days later – you will receive the feedback from the panel, and we will compare your predictions with their feedback. We will then ask you to complete the same questionnaires again.

The questionnaires will ask for a few details about you, including mood, body satisfaction, and self-esteem.

All photographs and email addresses will be deleted at the end of the study. All answers to the questionnaires are confidential. The information will be stored in a secure, online database. All the information will be anonymised, as you will create a unique participant identification code. The information will not be used for any other purposes. You are free to withdraw from the study at any time, including after completion of the study. Please keep a note of your participant ID which you will create at the beginning of the study, as this will be needed to find and remove your data. If you would like to withdraw from the study, please contact Fiona Lambert (flambert1@sheffield.ac.uk) or Glenn Waller (g.waller@sheffield.ac.uk).

You will receive 3 credits for taking part in the research, however you will only receive the credits if you complete all parts of the study.

If you would like a copy of a brief report on the outcome, then please email Fiona Lambert on: flambert1@sheffield.ac.uk.

If you have any questions or concerns, please contact Fiona Lambert or Glenn Waller (g.waller@sheffield.ac.uk). If you have any further concerns, please contact the University of Sheffield's Office of the Registrar and Secretary at +44-114 222 1101. If completing the questionnaires, or taking part in the tasks, distresses you in any way, please contact the University Health Service.

This research has been authorised by the Research Ethics Committee of the Department of Psychology, University of Sheffield, UK

Appendix D

Participant consent form

I have read the information sheet; I understand that my responses will be confidential, and that I can withdraw my consent at any time without any consequences.

I consent to take part in this study.

- Yes
- No

Appendix E

Participant debrief form

This is the end of the study. Thank you for your participation. Now you have completed the tasks, we want to provide you with further information about the research you have undertaken.

Why did we do this research?

Many females experience negative body image, which is a risk factor for numerous psychological difficulties. A process known as ‘mindreading’ can maintain negative body image, where we assume that we know what other people will think about our appearance. To address such thinking errors, clinicians use a technique known as ‘surveys’. Such surveys involve asking the individual what they think others will say about their appearance (say, in a photo), and then finding out what others do say. Thus, surveys allow people to test the accuracy of their beliefs about what other people think. However, although surveys are used within clinical practice, there is no evidence to support their effectiveness.

Therefore, we wanted to investigate the impact that survey feedback can have on body image, and to explore whether different people react differently to such feedback. We predicted that positive feedback from a survey would improve body image, and that the level of positivity would be related to the level of improvement. We included a control condition, where some people received feedback on a non-body photograph.

By completing this research, we will be building an evidence base for whether surveys are an effective way to help people gain a more positive body image.

Information about the survey feedback

As part of the research, you were asked to upload a photograph and give your predictions about what a panel of people would say about it. Two days later, you received survey feedback from a panel. We would like to reassure you that the photograph was not sent to a panel, and the survey feedback was standardized and unrelated to your photo. That allowed us to ensure that we could control the feedback that you received, and test its impact on your body image.

Do you have any questions?

If you have any questions or concerns, please contact Fiona Lambert (flambert1@sheffield.ac.uk) or Glenn Waller (g.waller@sheffield.ac.uk). Please email Fiona if you would like a summary report of the findings when they are ready.

Further reading

- Gowers, S.G., & Green, L. (2009). *Eating disorders: Cognitive behaviour therapy with children and young people*. Hove, UK: Routledge.
- Grant, J. R., & Cash, T. F. (1995). Cognitive-behavioral body image therapy: Comparative efficacy of group and modest-contact treatments. *Behavior Therapy*, 26, 69-84. doi:10.1016/S0005-7894(05)80083-8
- Grogan, S. (2002). *Body image: Understanding body dissatisfaction in men, women, and children*. London, UK: Routledge.

Hutchinson, N. & Calland, C. (2011). *Body image in the primary school*. Oxon, UK: Routledge.

Moe, B. (1999). *Understanding the causes of a negative body image*. New York, NY: The Rosen Publishing Group, Inc.

Appendix F

G*Power analysis output

[1] -- Monday, July 11, 2016 -- 09:16:20

F tests - ANOVA: Repeated measures, within-between interaction

Analysis:	A priori: Compute required sample size	
Input:	Effect size f	= 0.25
	α err prob	= 0.05
	Power (1- β err prob)	= 0.8
	Number of groups	= 3
	Number of measurements	= 2
	Corr among rep measures	= 0.5
	Nonsphericity correction ϵ	= 1
Output:	Noncentrality parameter λ	= 10.5000000
	Critical F	= 3.2380961
	Numerator df	= 2.0000000
	Denominator df	= 39.0000000
	Total sample size	= 42
	Actual power	= 0.8034136

[2] -- Monday, July 11, 2016 -- 09:16:54

F tests - ANOVA: Repeated measures, within-between interaction

Analysis:	A priori: Compute required sample size	
Input:	Effect size f	= 0.15
	α err prob	= 0.05
	Power (1- β err prob)	= 0.8
	Number of groups	= 3
	Number of measurements	= 2
	Corr among rep measures	= 0.5
	Nonsphericity correction ϵ	= 1
Output:	Noncentrality parameter λ	= 9.9900000
	Critical F	= 3.0803869
	Numerator df	= 2.0000000
	Denominator df	= 108
	Total sample size	= 111
	Actual power	= 0.8034951

[3] -- Monday, July 11, 2016 -- 09:17:11

F tests - ANOVA: Repeated measures, within-between interaction

Analysis:	A priori: Compute required sample size	
Input:	Effect size f	= 0.2
	α err prob	= 0.05
	Power (1- β err prob)	= 0.8
	Number of groups	= 3
	Number of measurements	= 2
	Corr among rep measures	= 0.5
	Nonsphericity correction ϵ	= 1
Output:	Noncentrality parameter λ	= 10.5600000
	Critical F	= 3.1428085
	Numerator df	= 2.0000000
	Denominator df	= 63.0000000
	Total sample size	= 66
	Actual power	= 0.8180744

Appendix H

Prediction form - experimental groups

My predictions about what the panel will say about the photograph of me:

1) Overall attractiveness

0	1	2	3	4	5	6	7	8	9	10
Very unattractive									Very attractive	

2) Face

0	1	2	3	4	5	6	7	8	9	10
Very unattractive									Very attractive	

3) Legs

0	1	2	3	4	5	6	7	8	9	10
Very unattractive									Very attractive	

4) Arms

0	1	2	3	4	5	6	7	8	9	10
Very unattractive									Very attractive	

5) My weight

0	1	2	3	4	5	6	7	8	9	10
Underweight									Overweight	

Appendix I

A copy of each outcome measure

Body Satisfaction Scale (BSS) (Slade et al., 1990)

THE BODY SATISFACTION SCALE

Please note how satisfied you are with each of the following parts of your body, by circling the appropriate number.

	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Undecided	Slightly Unsatisfied	Moderately Unsatisfied	Very Unsatisfied
1. Head	1	2	3	4	5	6	7
2. Face	1	2	3	4	5	6	7
3. Jaw	1	2	3	4	5	6	7
4. Teeth	1	2	3	4	5	6	7
5. Nose	1	2	3	4	5	6	7
6. Mouth	1	2	3	4	5	6	7
7. Eyes	1	2	3	4	5	6	7
8. Ears	1	2	3	4	5	6	7
9. Shoulders	1	2	3	4	5	6	7
10. Neck	1	2	3	4	5	6	7
11. Chest	1	2	3	4	5	6	7
12. Tummy	1	2	3	4	5	6	7
13. Arms	1	2	3	4	5	6	7
14. Hands	1	2	3	4	5	6	7
15. Legs	1	2	3	4	5	6	7
16. Feet	1	2	3	4	5	6	7

Cognitive Scales of the Eating Disorder-15 (ED-15) (Tatham et al., 2015)

		Not at all	Rarely	Occasionally	Sometimes	Often	Most of the time	All the time
	Over the past week, how often have I:							
1	Worried about losing control over my eating.	0	1	2	3	4	5	6
2	Avoided activities or people because of the way I look	0	1	2	3	4	5	6
3	Been preoccupied with thoughts of food and eating	0	1	2	3	4	5	6
4	Compared my body negatively with others?	0	1	2	3	4	5	6
5	Avoided looking at my body (e.g., in mirrors; wearing baggy clothes) because of the way it makes me feel	0	1	2	3	4	5	6
6	Felt distressed about my weight	0	1	2	3	4	5	6
7	Checked my body to reassure myself about my appearance (e.g., weighing myself; using mirrors)	0	1	2	3	4	5	6
8	Followed strict rules about my eating	0	1	2	3	4	5	6
9	Felt distressed about my body shape	0	1	2	3	4	5	6
10	Worried that other people were judging me as a person because of my weight and appearance.	0	1	2	3	4	5	6

Brief Fear of Negative Evaluation Scale (Leary, 1983)

Please read each of the following statements carefully and indicate how characteristic it is of you, by circling the appropriate number on the scale:

	Not at all	Slightly	Moderately	Very	Extremely
I worry about what other people will think of me even when I know it doesn't make any difference.	0	1	2	3	4
I am unconcerned even if I know people are forming an unfavourable impression of me.	0	1	2	3	4
I am frequently afraid of other people noticing my shortcomings.	0	1	2	3	4
I rarely worry about what kind of impression I am making on someone.	0	1	2	3	4
I am afraid that others will not approve of me.	0	1	2	3	4
I am afraid that other people will find fault with me.	0	1	2	3	4
Other people's opinions of me do not bother me.	0	1	2	3	4
When I am talking to someone, I worry about what they may be thinking about me.	0	1	2	3	4
I am usually worried about what kind of impression I make.	0	1	2	3	4
If I know someone is judging me, it has little effect on me.	0	1	2	3	4
Sometimes I think I am too concerned with what other people think of me.	0	1	2	3	4
I often worry that I will say or do the wrong things.	0	1	2	3	4

GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006)

Over the last 2 weeks, how often have you been bothered by the following problems? <i>(Use “□” to indicate your answer”</i>	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

PHQ-9 (Kroenke, Spitzer & Williams, 2001)**PHQ-9**

**Over the last 2 weeks, how often have you
been bothered by any of the following problems?**

(Use “□” to indicate your answer”

	Not all at all	at Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things.....	0	1	2	3
2. Feeling down, depressed, or hopeless.....	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much.....	0	1	2	3
4. Feeling tired or having little energy.....	0	1	2	3
5. Poor appetite or overeating.....	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down.....	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television.....	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual.....	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way.....	0	1	2	3

Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1965)

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

- | | | | | | |
|-----|--|----|---|---|----|
| 1. | On the whole, I am satisfied with myself. | SA | A | D | SD |
| 2.* | At times, I think I am no good at all. | SA | A | D | SD |
| 3. | I feel that I have a number of good qualities. | SA | A | D | SD |
| 4. | I am able to do things as well as most other people. | SA | A | D | SD |
| 5.* | I feel I do not have much to be proud of. | SA | A | D | SD |
| 6.* | I certainly feel useless at times. | SA | A | D | SD |
| 7. | I feel that I'm a person of worth, at least on an equal plane with others. | SA | A | D | SD |
| 8.* | I wish I could have more respect for myself. | SA | A | D | SD |
| 9.* | All in all, I am inclined to feel that I am a failure. | SA | A | D | SD |
| 10. | I take a positive attitude toward myself. | SA | A | D | SD |