



The Role of Shame in Eating Disorders

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Chapter 1

Introduction

Introduction: Thesis Overview

The following thesis examines the role of shame in eating disorder (ED) symptomatology. In doing so, the roles of guilt and social comparison, two mechanisms postulated to accompany shame in the aetiology of ED presentations, are also considered. This thesis consists of two parts: a systematic review and an empirical study. The following chapter aims to provide the reader with an overview of these two sections.

Chapter 2: Systematic Review

Anorexia (AN) and bulimia nervosa (BN) are two prevalent EDs, characterised by disturbed eating behaviours (e.g., severe dietary restriction, binge-eating and purging; American Psychiatric Association, 2013). Eating disorders such as AN and BN have significant implications for physical health, as well as social and emotional functioning (Lampard & Sherbanee, 2015). At present, the aetiology of AN and BN is not well understood. Current explanations, which commonly focus upon distorted cognitions appear to be lacking and in turn, may compromise the efficacy of the treatments they underpin (Cooper, 2005, 2012; Waller & Kennerley, 2003). More recently, the role of different emotional states has become of interest. In particular, shame and guilt have been implicated in the aetiology of various psychological presentations, including EDs (e.g., depression; Burney & Irwin, 2000; Doran & Lewis, 2012; Fairburn, 1981; Kim, Thibodeau, & Jorgensen, 2011). Shame (associated with global negative evaluations of the self) and guilt (associated with negative evaluations regarding behaviour; Tangney & Dearing, 2002) were therefore the focus of the following systematic review. A recent qualitative review considered the role of shame and guilt in general eating disorder presentations (Oluyori, 2013). However, to the author's knowledge, a review of the quantitative literature focused upon AN and BN presentations has not previously been completed.

The following review is the result of a systematic search strategy. It aimed to synthesise the available quantitative evidence regarding the role of shame and guilt in clinical AN and BN presentations. Results supported the work of Oluyori (2013), suggesting that shame is a common experience of those with AN and BN presentations. However, the role of guilt appeared to be less clear. The results of the systematic review are considered in terms of their limitations, as well as their implications for clinical practice. Recommendations for future research are provided.

Chapter 3: Empirical Study

Building upon the recommendations of the previous chapter, the empirical study aimed to consider the role of shame and ED symptomatology in a non-clinical student population. In doing so, the role of social comparison and attempts to control eating are also considered. Guilt was also measured during the study, due to its close association with the concept of shame (Tangney & Dearing, 2002). The empirical study utilised an experience sampling methodology (ESM). This methodology allowed for the collection of self-report data regarding shame, eating control and social comparison on a momentary basis. Momentary data is typically collected in real-time and at multiple time-points. It does not rely on retrospective recall. To date, much research in this area has been cross-sectional in nature. Multi-level analysis indicated that an aspect of ED symptomatology (i.e., concern regarding eating) was predictive of momentary experiences of shame. Both shame and guilt were found to be predictive of attempts to control eating. However, shame was associated with greater attempts to control eating, whereas guilt was associated with reduced attempts to control eating. An effect of social comparison was not observed. Limitations of this study and recommendations for future research are discussed. Clinical implications are also considered. This study provided support for the use of interventions which target negative emotional

states, such as shame. Moreover, it is suggested that interventions which operate on a momentary basis may be useful.

Thesis Summary

The following thesis considers the role of shame, along with postulated accompanying mechanisms, in those with clinical diagnoses of AN and BN, as well as a non-clinical sample. This thesis contributes to the literature base by providing a systematic review of the available quantitative evidence, regarding the experience of shame and guilt in AN and BN groups. Moreover, it builds upon some of the limitations identified during the literature review, to provide further empirical support for the importance of considering the role of shame during both preventative and reparative ED interventions.

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Chapter 2

Systematic Review

**Experiences of Shame and Guilt in Clinical Anorexia and Bulimia Nervosa
Presentations: A Systematic Review**

Abstract

Objective: To consider the role of shame and guilt in anorexia (AN) and bulimia nervosa (BN).

Method: Four major databases were searched for studies considering guilt and/or shame in clinically diagnosed AN and BN groups. The methodological quality of included articles was assessed.

Results: Fifteen papers met the identified inclusion criteria. Several methodological issues were noted within the reviewed studies. However, the role of shame was identified as a prominent emotion reported by AN and BN groups. The role of guilt was less clear, but it appeared to be implicated in binge/purge behavioural presentations.

Conclusion: Whilst both emotions appear to be implicated in the aetiology of AN/BN presentations, the role of shame appears to be more prominent than guilt alone. Intervention approaches which focus upon the experience of shame (e.g., compassion focused therapy) may therefore be of benefit. Recommendations for future research are discussed.

Keywords: Shame; guilt; bulimia nervosa; anorexia nervosa; eating disorder.

Introduction

Eating disorders (EDs) are characterised by disturbed eating behaviours and affect 1.6 million people within the United Kingdom (UK; Beating Eating Disorders, 2012). EDs have the highest mortality rates of all mental health difficulties (Beating Eating Disorders, 2012). Bulimia nervosa (BN) and anorexia nervosa (AN) are two common ED presentations. BN is characterised by recurrent cycles of binge eating and compensatory behaviours, such as diet restriction, self-induced vomiting and laxative misuse (American Psychiatric Association, APA, 2013). AN is commonly characterised by severe restriction of dietary intake, significantly low-body weight and an intense fear of weight gain. Self-evaluations of those with AN and BN are unduly influenced by weight and body shape (APA, 2013).

At present, the aetiology of AN and BN is not well understood and no adequate explanation for the development of either difficulty has been established (Corning, Krumm, & Smitham, 2006). The long-term prognosis of those presenting with AN and BN is poor (Collings & King, 1994; Steinhausen, 2002). Whilst advances in the provision of psychological interventions for AN and BN have been made, outcomes are variable and many continue to present with difficulties following treatment (Wilson, Grilo, & Vitousek, 2007). AN in particular appears to be less receptive to change (Jansen, 2001). Relapse rates for both AN and BN are reportedly high (Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; Grilo et al., 2012). This makes AN and BN presentations costly for the individual (i.e. social, emotional and physical functioning), health care providers (currently estimated to be £3.9-4.6 billion within the UK), and society as a whole (Lampard & Sharbanee, 2015; PriceWaterhouseCoopers, 2015). It is imperative that cost-effective methods of treatment are made available. This is reliant upon a comprehensive understanding of the mechanisms underlying and maintaining these presentations (Cooper, 2012; Jansen, 2001).

Cognitive models have dominated contemporary explanations of AN and BN (Waller & Kennerley, 2003). Cognitive explanations suggest that EDs are underpinned by erroneous thoughts and perceptions (Fairburn & Cooper, 1989; Garner & Bemis, 1982; Wilson & Fairburn, 1993). Within cognitive-behavioural therapy (CBT), focus is placed upon challenging negative automatic thoughts, dysfunctional assumptions and cognitive distortions related to body image, weight and food (Waller & Kennerley, 2003). More recent cognitive models have also emphasised the role of control in AN, alongside low self-esteem, perfectionism, mood intolerance and interpersonal differences in EDs more generally (Fairburn, Cooper, & Shafran, 2003).

Whilst cognitive models appear to offer significant insights into the maintenance of AN and BN presentations, they provide insufficient explanation regarding causation (Cooper, 2012). Moreover, whilst CBT for BN has been associated with improved outcomes for some, many continue to present with significant difficulties following intervention (Cooper, 2012; Fairburn et al., 1995). Fairburn et al. (1995) reported that five years post intervention, 73% of those with BN continued to present with a diagnosable ED. At present, evidence supporting the use of CBT for AN is limited, with many continuing to present as symptomatic post-intervention (e.g. McIntosh et al., 2005). It has been suggested that whilst important, current cognitive explanations of AN and BN may be lacking, and therefore compromise the efficacy of the treatment approaches they underpin (Cooper, 2005; 2012; Waller & Kennerley, 2003). Some consideration of the role of emotion in BN and AN is now evident in cognitive approaches (e.g. Cooper, 2012; Cooper, Wells, & Todd, 2004). Such developments are informed by evidence which suggests that ED behaviours (e.g. binge eating) may facilitate affect regulation, and enable the individual to avoid negative emotional states (Heatherton & Baumeister, 1991; Polivy & Herman, 1993). However, at present, cognitive models do not

appear to adequately explain the role of different emotional states (e.g. guilt and shame) in the onset and maintenance of AN and BN.

Shame is a complex emotion, which involves global self-devaluations, and concern for negative evaluations of the self by others (Tangney & Dearing, 2002). Shame may be experienced as painful, impair the sense of self and result in attempts to escape negative internal experiences (Tangney & Dearing, 2002). Guilt is commonly associated with shame (Tangney, Wagner, & Gramzow, 1992) and the terms are often mistakenly used interchangeably within the literature (Burney & Irwin, 2000). Unlike shame, guilt does not impact upon the global sense of self and is instead associated with negative evaluations of specific behaviours. Therefore, the self remains intact and concern focuses upon the consequences of the behaviour upon others (Tangney & Dearing, 2002).

Guilt and shame are both associated with psychological difficulties (e.g. Andrews, Qian & Valentine, 2002; Cook, 1994; Gilbert, 2000; Veale, 2002). Tangney (1995) suggests shame is less easily resolved than guilt. Unlike shame, guilt may be resolved through reparative action regarding a specific behaviour (Tangney & Dearing, 2002). Evidence from a recent meta-analysis supports this, as it found that shame had a more prominent role than guilt in symptoms of depression (Kim, Thibodeau, & Jorgensen, 2011).

Both guilt and shame have also been implicated in the aetiology of EDs (Burney & Irwin, 2000; Doran & Lewis, 2012; Fairburn, 1981; Frank, 1991; Le Grange, Lock, Loeb, & Nicholls, 2010). EDs are argued to be more prominently associated with negative feelings regarding the self (i.e. shame), as opposed to negative feelings towards behaviour (i.e. guilt; Burney & Irwin, 2000; Sanftner, Barlow, Marschall, & Tangney, 1995). ED behaviours, including attempts to control diet or weight, may emerge in response to aversive feelings of shame and inferiority as a strategy to improve self-image in a specific domain (e.g., weight or

shape). Shame may also result in withdrawal and disengagement from family members and in turn result in wider familial/systemic issues. Conversely, as guilt only concerns specific behaviours, it is arguably less likely to drive ED behaviours in the same way. Guilt may instead, for example, encourage active engagement with family members, as a means of reparative action.

Some suggest that shame and guilt have a causal role in ED presentations, whilst others suggest that they are a consequence (Burney & Irwin, 2000; Oluyori, 2013; Sanftner et al., 1995). Therefore, the respective contributions of guilt and shame in ED aetiology remains unestablished and at present, research within this area is limited.

Oluyori (2013) compiled evidence from five qualitative research papers in a recent systematic review and concluded that shame is implicated in both the onset and maintenance of ED presentations. However, the conclusions did not shed light on the specific role of these emotions within AN and BN. A systematic review of the quantitative evidence-base is timely, enabling a triangulation of results with the qualitative literature. To the author's knowledge, no review of this nature has been completed to date.

Review Aims

This review aims to systematically consider quantitative research regarding the role of shame and guilt in AN and BN clinical presentations. It is expected that both shame and guilt will be associated with these presentations, due to the commonalities shared by the emotions (Hayaki, Friedman, & Brownell, 2002; Tangney et al., 1992). However, it is expected that only shame will be independently associated with ED symptoms. Furthermore, it is hypothesised that the role of shame will be more pronounced than that of guilt.

Method

Search Strategy

A literature review was completed to identify quantitative studies which measured experiences of guilt and/or shame, in those with clinical presentations of AN and/or BN. Four databases were utilised (PubMed.gov; PsycINFO; Medline; Web of Science). Searches were completed from inception to November 2015. The search strategy used the following terms (a) terms related to ED presentations: “*eating disorder**” OR *anorexia* OR *bulimia* OR *binge** OR *binge-eating* OR “*eating disorder not otherwise specified*” OR *EDNOS*; (b) terms associated with the feelings guilt and shame: *shame** OR *guilt** OR *anger* OR *hostil**. Search terms from each group were combined using the Boolean operator “AND”. Broad search terms were purposely utilised to ensure that papers were not overlooked due to variances in author terminology. Identified articles were initially screened by title and abstract. The full texts of remaining articles were then read to check eligibility with inclusion criteria.

Inclusion Criteria

Studies included in the review met the following criteria: (a) were peer-reviewed original research papers; (b) full-text articles available in English; (c) utilised a quantitative methodology; (d) featured a group of individuals with an ED, specifically where AN and/or BN presentations (defined as having a diagnosis of these disorders, whether self-reported or clinically verified) accounted for $\geq 50\%$ of the sample; (e) either measured ED relevant symptoms, compared a clinical AN and/or BN sample with a control group; or made AN and BN sub-type comparisons; (f) guilt and/or shame was measured independently. Due to the lack of consensus regarding definitions of guilt and shame, papers which reported to measure, but did not define these emotions, were retained. Papers were excluded if they did not meet the inclusion criteria or insufficient information was available to establish eligibility.

An adapted version of the Preferred Reporting Items for Systematic Reviews (PRISMA) flow chart depicts the screening process (see Figure 1; Moher, Liberati, Tetzlaff, & Altman, 2009).

The authors of four papers were contacted to obtain further details and establish whether their research satisfied the inclusion criteria. One of the authors offered further clarification and this paper was included (Rockenberger & Brauchle, 2011). In total, 17 studies were excluded. Reasons for exclusion (e.g., neither shame nor guilt measured within the study) can be found in Appendix A. This left 15 studies to be included in the review. The reference lists of the 15 eligible papers were hand-searched by the first author. No additional papers were identified. Five experts within the field of shame, guilt and eating disorders were also contacted via electronic mail. They were invited to offer any further published articles not previously identified through the database searches. No additional papers were identified.

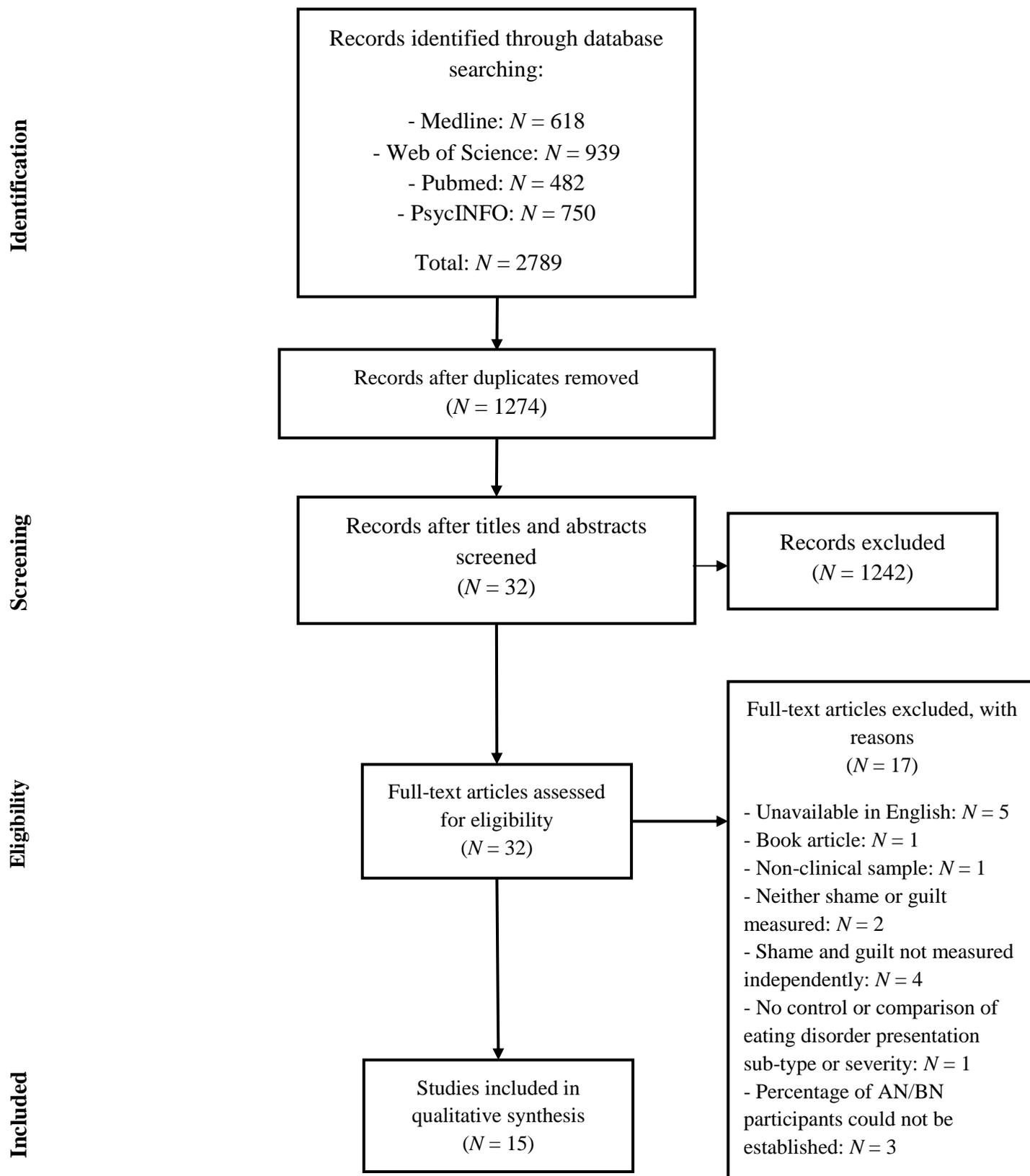


Figure 1. Flow of Information through the Systematic Information Review Process

Quality Assessment

The final 15 papers were assessed for methodological quality using an adapted version of a risk of bias tool created by Williams, Plassman, Burke, Holsinger, and Benjamin (2010). This tool has previously been adapted and utilised in a review by Taylor, Hutton, and Wood (2015). In summary, quality was determined based upon criteria which considered the representativeness and description of the cohort; the methods utilised to ascertain diagnoses and measure outcomes; and whether analyses were appropriate and included consideration of confounding variables. Quality was rated using the terms *yes*, *no*, *partial* and *unclear*, as the utility of numeric quality assessment tools have been questioned and considered to be subject to greater risk of bias (Higgins & Altman, 2008; Williams et al., 2010). Two reviewers (SB and CL) independently quality assessed all articles and discrepancies were discussed. In cases of disagreement, a third reviewer was consulted (PJT).

Results

Overview of Included Studies

Details of the 15 papers included in the review can be found in Table 1.1. Twelve of the included studies were cross-sectional. Of these, five studies utilised a non-clinical control group, two studies compared those with ED presentations with other clinical groups, and one study compared individuals with ED presentations with both a non-clinical control and a clinical group. A further three cross-sectional studies did not utilise a comparison group. Two included studies utilised an experience sampling methodology (ESM; a method of collecting self-report data on a momentary basis), and one was longitudinal in nature.

Quality Assessment

Results of the quality assessment can be found in Table 1.2. A prominent limitation identified was the selection and utilisation of the cohort within papers. One paper did not indicate how the clinical status of participants was established (Allen, Scannell, & Turner, 1998). Two studies also included sub-clinical participants within the clinical sample (De Young et al., 2013; Swan & Andrews, 2003). Four studies within the review included participants with self-diagnoses (Doran & Lewis, 2012; Keith, Gillanders, & Simpson, 2009; Swan & Andrews, 2003; Troop & Redshaw, 2012). Whilst three of these studies (Keith et al., 2009; Swan & Andrews, 2003; Troop & Redshaw, 2012) attempted to verify diagnoses, the tools utilised were not strictly diagnostic and the latter study permitted the inclusion of participants with “possible/probable diagnoses” (p.374). Furthermore, one study included participants identified as ED symptomatic within the non-clinical sample (Doran & Lewis, 2012). One study included participants who were described as “recovered” within the clinical sample (Troop & Redshaw, 2012; p.374). This blurring of the boundary between symptomatic individuals and controls is likely to limit what can be concluded from

comparisons. Collectively, the representativeness of these studies with regards to AN and BN clinical status is questionable. A further difficulty is the inability to distinguish descriptive information and results relating to AN and BN participants, as five papers do not distinguish participants on this basis (Doran & Lewis, 2012; Ferreira, Pinto-Gouveia, & Duarte, 2013; Kelly & Carter, 2013; Rockenberger & Brauchle, 2011; Swan & Andrews, 2003). A further identified limitation was that the majority of the included studies were cross-sectional, with only one utilising a longitudinal design (Troop & Redshaw, 2012) and two utilising ESM (Berg et al., 2013; De Young et al., 2013). This makes it difficult to make inferences regarding causality or direction of effect.

The potential impact of confounding variables was often overlooked. No papers controlled for guilt when measuring shame, or shame when measuring guilt. This is particularly important because, as previously stated, they commonly co-occur (Tangney et al., 1992). Two studies within the review controlled for demographic factors (Berghold & Lock, 2002; Kollei, Brunhoeber, Rauh, de Zwaan, & Martin, 2012). Five studies controlled for depression/negative affect or included it as a covariate in their analyses (Berg et al., 2013; Grabhorn, Stenner, Stangier, & Kaufhold, 2006; Kelly & Carter, 2013; Swan & Andrews, 2003; Troop & Redshaw, 2012). When ED versus healthy control sample comparisons were made, one study failed to consider ED symptomatology in the non-clinical group (Berghold & Lock, 2002).

It was unclear whether the use of outcome measures by several of the included papers was appropriate. Numerous papers utilised measures which did not appear to independently measure guilt or shame, but instead conflated these constructs (e.g., Allen et al., 1998; Berghold & Lock, 2002; De Young et al., 2013; Kollei et al., 2012). Three studies adapted measures of shame and guilt, but the psychometrics of these adaptations were unclear (Franzoni et al., 2013; Kollei et al., 2012; Rockenberger & Brauchle, 2011). A further paper

reported measuring guilt, but it was unclear how this was completed (Yellowlees, 1985). An overarching difficulty with the papers included in this review was that the concepts of shame and guilt appeared to differ between studies. Such heterogeneity made comparisons between studies difficult.

Only two of the included papers reported having completed power calculations (Keith et al., 2009; Troop & Redshaw, 2012). The majority of papers did not provide information regarding whether data assumptions were met (Berghold & Lock, 2002; Doran & Lewis, 2012; Grabhorn et al., 2006; Kelly & Carter, 2013; Kollei, et al., 2012; Rockenberger & Brauchle, 2011; Swan & Andrews, 2003; Troop & Redshaw, 2012; Yellowlees, 1985). It was therefore difficult to ascertain the suitability of the analyses completed.

Table 1.1

Characteristics of Included Studies

Study Number	Authors, Year & Country	Design	ED Sample	Comparison Sample	ED Measure	Guilt/Shame Measure
1	Allen, Scannell, & Turner (1998), Australia	Cross-sectional	Clinically diagnosed BN sample accessing support group ($N=17$; 100% female)	University Students ($N=20$, female)	EDI-2	Guilt: BD-I
2	Berg et al. (2013), United States of America	Experience Sampling	BN sample (based on DSM-IV-TR) from clinical, community and campus settings ($N=133$; 100% female; M age=25.3)	NA	SCID-I/P Eating Disorder Checklist (Author created)	Guilt: PANAS (guilt facet)
3	Berghold & Lock (2002), United States of America	Cross-sectional	AN sample (DSM-IV) from an ED clinic ($N=33$; 94% female; median age=14 (range 12-18))	Historic sample from two high-schools ($N=330$; 55.9% female; M age=16.6, $SD=1.1$)	EDE	Guilt: IGQ-69
4	De Young et al. (2013), United States of America	Experience Sampling	BN Sample (DSM-IV; $N=121$; 100% female; M age=25.21, $SD=7.55$) AN Sample. $N=27$ met diagnostic criteria (DSM-IV) and $N=20$ were sub-threshold. Total $N=47$ (15 restrictive and 32 binge-purge subtypes; 100% female; M age=25.68, $SD=8.27$)	NA	EDE Eating Disorder Checklist (Author created)	Guilt: PANAS (50% of guilt facet)
5	Doran & Lewis (2012), United Kingdom	Cross-sectional	Both AN and BN samples from clinical, community and educational settings General ED sample with self-reported diagnosis ($N=167$; AN; BN; BED; EDNOS; 100% female; M age=26, range: 16-60). AN made up the majority of the sample (specific N unknown).	Non-clinical control sample from schools/colleges and the internet ($N=1115$; 77% female; female M age=23, range: 16-62; Male M age=22, range: 16-72)	EAT-26 EDRC (formed from EDI-3 scales)	Shame: ESS

6	Ferreira, Pinto-Gouveia, & Duarte (2013), Portugal	Cross-sectional	General ED hospital patient sample: $N=102$ (100% female; M age=23.62, $SD=7.42$): 32.4% AN; 30.4% BN; 37.2% EDNOS (DSM-IV-TR)	Non-clinical sample from educational and corporate settings ($N=123$; 100% female; M age=23.5, $SD=6.89$)	EDE EDI subscales (“drive for thinness”; “bulimia”; “body dissatisfaction”; p.208) BUT	Shame: OAS (Portuguese version)
7	Franzoni et al. (2013), Italy	Cross-sectional	General ED outpatient sample: $N=143$ (100% female; M age=20.3, $SD=30.2$): 46.8% AN; 36.6% BN; 16.7% EDNOS (DSM-IV)	NA		Shame: ESS
8	Grabhorn, Stenner, Stangier, & Kaufhold (2006), Germany	Cross-sectional	AN sample (DSM-IV; $N=30$; 17 restrictive and 13 bulimic subtype; M age=25, range: 17-55). BN sample (DSM-IV; $N=30$; M age=24.9, range: 17-40) AN and BN sample both accessing inpatient treatment and psychotherapy	Depression sample (DSM-IV; $N=30$; M age=41.1, range: 18-60) Anxiety sample (DSM-IV; $N=30$; M age=36.9, range: 18-60) Depression and anxiety sample both accessing inpatient treatment and psychotherapy	NA	Shame: ISS (German version)
9	Keith, Gillanders, & Simpson (2009), United Kingdom	Cross-sectional	General ED sample accessing outpatient services or registered with ED charity: $N=52$ (100% female; M age=33, $SD=10.6$; 36.5% outpatients; 63.5% registered with charity): AN: 30%; BN: 35%; BED: 5%; EDNOS: 30%. All considered to meet DSM-IV criteria	NA	EDDS	Shame: ESS modified
10	Kelly & Carter (2013), Canada	Cross-sectional	General ED hospital sample: $N=74$ (31% inpatient; 69% outpatient; 97% female; M age=27.5, $SD=9.3$): AN restricting subtype: 29.2%; AN binge-purge subtype: 18.5%; BN: 29.2%; EDNOS: 23.1% (DSM-IV)	NA	EDE-Q	Shame: ESS

11	Kollei, Brunhoeber, de Zwaan, & Martin (2012), Germany	Cross-sectional	AN inpatient sample: $N=32$ (DSM-IV; 93.8% female; M age=26.94, $SD=9.15$) BN inpatient sample: $N=34$ (DSM-IV; 97.1% female; M age=25.94, $SD=8.25$)	BDD inpatient and internet self-help group sample: $N=31$ (DSM-IV; 61.3% female; M age=28.77, $SD=8.91$) Healthy control sample: $N=33$ (69.7% female; M age=26.91; $SD=8.48$)	SCID-I	Shame & Guilt: DES (German version)
12	Rockenberger & Brauchle (2011), Germany	Cross-sectional	General outpatient ED sample: $N=27$ (ICD-10: F50): AN: 18.5%; BN: 33.3%; atypical BN: 7.4%; over eating: 33.3%; other ED: 3.7%; ED unspecified: 3.7%	General outpatient sample: Affective disorders (F30-39): $N=72$; Phobic & other anxiety disorders (F40 & 41): $N=45$; Adjustment & stress disorders and mixed anxiety & depression (F43 and F41.2): $N=58$; Somatoform disorders (F45) $N=24$; personality disorders (F60-61): $N=37$	NA	Guilt: TOSCA Shame: ESS and TOSCA
13	Swan & Andrews (2003), United Kingdom	Cross-sectional	General ED sample from ED association (self-report current & recovered): Total $N=68$ (48% currently receiving treatment; 100% female; M age=30.67, $SD=10.17$). At peak of symptoms: AN: $N=51$; BN: $N=4$; EDNOS: $N=12$; unclassified: $N=1$. Current: $N=41$ (AN: $N=11$; BN: $N=1$; EDNOS: $N=17$; Sub-clinical, but included: $N=12$); Recovered: $N=21$	Non-clinical control sample (university students & staff): $N=72$ (M age=26.2, $SD= 10.65$)	Diagnostic questionnaire based on DSM-IV EAT-26	Shame: ESS modified
14	Troop & Redshaw (2012), United Kingdom	Longitudinal	Self-reported general ED sample: $N=55$ ("possible or probable" diagnosis; p.374; 100% female; M age=34.6, $SD=9.6$): AN restrictive: 13%; AN binge-purge type: 43%; BN: 20%; EDNOS: 24%. $\frac{1}{3}$ in remission/recovery	NA	SEED	Shame: BSS; OAS; PFQ

15	Yellowlees (1985), United Kingdom	Cross-sectional	AN non-binging sample: $N=16$ (94.1% female; M age: 20.4) AN binging sample: $N=15$ (100% female; M age=25.8) All historic & current general ED hospital patients, categorised based on DSM-III.	NA	NA	Guilt: Author created questions
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BD-I: Buss-Durkee Inventory (Buss & Dukee, 1957); EDI-2: Eating Disorder Inventory – 2 (Garner, 1991); DSM-IV-TR: Diagnostic and Statistical Manual for Mental Disorders (4th edition., text revision; APA, 2000); SCID-I/P: Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (First, Spitzer, Gibbon, & Williams, 1995); PANAS: Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988); DSM-IV: Diagnostic and Statistical Manual for Mental Disorders (4th edition; APA, 1994); EDE: Eating Disorder Evaluation (Cooper & Fairburn, 1987); IGQ-69: Interpersonal Guilt Questionnaire, Adolescent Version (Mulherin, 1998); EAT-26: Eating Attitudes Test (Garner, Olmsted, Bohr, & Garfinkel, 1982); EDI: Eating Disorder Inventory (Garner, Olmsted, & Polivy, 1983; Portuguese version: Machado, Goncalves, Martins, & Soares, 2001); EDRC: Eating Disorder Risk Composite; EDI-3: Eating Disorder Inventory – 3 (Garner, 2004); OAS: Other as a Shamer Scale (Goss, Gilbert, & Allan, 1994; Portuguese version: Matos, Pinto-Gouveia, & Duarte, 2011); BUT: Body Uneasiness Test (Cuzzolaro, Vetrone, Marano, & Garfinkel, 2006); ESS: Experience of Shame Scale (Andrews, Qian, & Valentine, 2002); ISS: Internalised Shame Scale (Cook, 1994); BED: binge eating disorder; EDNOS: eating disorder not otherwise specified; EDDS: Eating Disorder Diagnostic Scale (Stice, Telch, & Rizvi, 2000); ESS modified: Experience of Shame Scale (modified; Swan & Andrews, 2003); EDE-Q: Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994); BDD: Body dysmorphic disorder; DES: Differential Emotion Scale (Izard, Dougherty, Bloxom, & Kotsch, 1974; German version: Merten & Krause, 1992); ICD-10: International Statistical Classification of Diseases and Related Health Problems: 10th Revision (World Health Organisation, 2010); TOSCA: The Test of Self-Conscious Affect-3 (Tangney, Dearing, Wagner, & Gramzow, 2000); SEED: Short Evaluation for Eating Disorders (Bauer, Winn, Schmidt, & Kordy, 2005); BSS: Bodily Shame Scale (Troop, Sotrilli, Serpell, & Treasure, 2006); PFQ: Personal Feelings Questionnaire (Harder & Zalma, 1990); DSM-III: Diagnostic and Statistical Manual for Mental Disorders (3rd edition; APA, 1980)

Table 1.2

Overview of Assessment of Study Methodological Quality

Authors	Unbiased selection of cohort	Selection minimises baseline differences in demographic factors*	Sample size calculation*	Adequate description of the cohort	Validated method for ascertaining AN and/or BN status	Validated methods for assessing guilt and/or shame	Validated methods for assessing ED symptom severity*¹	Outcome assessments blind to diagnostic status	Adequate follow-up*²	Missing data minimal	Analysis controls for confounders*	Analytic methods appropriate*
Allen, Scannell, & Turner (1998)	Partial	No	No	No	Unclear	Partial	Yes	No	NA	Unclear	No	Yes
Berg et al. (2013)	Partial	NA	No	Yes	Yes	Partial	NA	No	NA	Unclear	Partial	Yes
Berghold & Lock (2002)	Partial	No	No	Partial	Yes	Partial	NA	No	NA	Unclear	No	Unclear
De Young et al. (2013)	No	Yes	No	Yes	Partial	Partial	Yes	No	NA	Unclear	No	Yes
Doran & Lewis (2012)	No	No	No	No	No	Yes	Partial	No	NA	Unclear	No	Unclear
Ferreira, Pinto-Gouveia, & Duarte (2013)	Partial	Partial	No	Partial	Partial	Yes	Yes	No	NA	Unclear	No	Yes
Franzoni et al. (2013)	Yes	Unclear	No	Partial	Yes	Partial	Yes	No	NA	Unclear	Partial	Yes
Grabhorn, Stenner, Stangier, & Kaufhold (2006)	Partial	No	No	Partial	Yes	Yes	NA	No	NA	Unclear	Partial	Unclear
Keith, Gillanders, & Simpson (2009)	Partial	NA	Yes	Partial	No	Yes	Yes	No	NA	Unclear	No	Yes

Kelly & Carter (2013)	Partial	NA	No	Partial	Partial	Yes	Yes	No	NA	Unclear	Partial	Unclear
Kollei, Brunhoeber, de Zwaan, & Martin (2012)	Partial	No	No	Yes	Yes	Unclear	NA	No	NA	Unclear	No	Unclear
Rockenberger & Brauchle (2011)	No	Unclear	No	Partial	Partial	Partial	NA	No	NA	Yes	No	Unclear
Swan & Andrews (2003)	No	No	No	Partial	Partial	Yes	NA	No	NA	Unclear	Partial	Unclear
Troop & Redshaw (2012)	No	NA	Yes	Partial	No	Yes	Yes	No	Yes	No	Partial	Unclear
Yellowlees (1985)	Partial	No	No	No	Partial	Unclear	NA	No	NA	Unclear	No	Unclear

* Criteria only applicable to certain designs; ¹ Note that this criterion only applied to those studies which measured severity of ED symptoms ² Note that this criterion only applied to longitudinal studies.

Shame

Between-group comparison studies.

Seven studies considered the role of shame in those with AN and/or BN presentations by making group comparisons (Doran & Lewis, 2012; Ferreira et al., 2013; Franzoni et al., 2013; Grabhorn et al., 2006; Kollei et al., 2012; Rockenberger & Brauchle, 2011; Swan & Andrews, 2003). Six of these studies reported significantly higher levels of shame in clinical groups with AN or BN presentations, versus both non-clinical controls ($k = 4$; Doran & Lewis, 2012; Ferreira et al., 2013; Kollei et al., 2012; Swan & Andrews, 2003) and clinical control groups (i.e. presentations of negative affect/depression and anxiety/phobia; $k = 2$; Grabhorn et al., 2006; Rockenberger & Brauchle, 2011). Effect sizes were typically moderate to large ($d = 0.66 - 2.08$). Only one study found no significant difference, when considering shame proneness (Rockenberger & Brauchle, 2011). However, the concept of shame proneness is based on hypothetical judgements about circumstances when one might feel shame and may differ to actual experiences of shame. Two studies directly compared AN and BN groups, but no significant difference was reported (Franzoni et al., 2013; Grabhorn et al., 2006).

Three studies focussed specifically on shame related to the body/physical appearance (Kollei et al., 2012; Rockenberger & Brauchle, 2011; Swan & Andrews, 2003) and reported significantly higher levels in clinical groups with AN or BN presentations, versus both non-clinical controls ($k = 2$; Kollei et al., 2012; Swan & Andrews, 2003) and clinical control groups (i.e. affective, phobic/anxiety, adjustment/stress/mixed depression and anxiety and somatoform presentation groups; $k = 1$; Rockenberger & Brauchle, 2011). Effect sizes were large ($d = 1.02 - 1.44$). A further study reported that shame was associated with body image uneasiness to a similar extent in AN and BN groups (53 and 58% of variance respectively; Franzoni et al., 2013). However, no significant difference in bodily shame was reported

between clinical groups with AN or BN presentations, versus clinical groups defined as presenting with personality and body dysmorphic disorders (Kollei et al., 2012; Rockenberger & Brauchle, 2011). Furthermore, Swan and Andrews (2003) reported no significant difference between current and recovered ED groups in terms of bodily shame.

Two studies focused specifically on shame related to character (personal attributes of the self), and eating (Rockenberger & Brauchle, 2011; Swan & Andrews, 2003). Significantly higher levels of character and eating shame were reported in clinical groups with AN or BN presentations, versus non-clinical controls, and recovered ED controls ($k = 1$; Swan & Andrews, 2003). Effect sizes were large ($d = 1.14 - 2.77$). Significantly higher levels of character shame were also reported between ED and clinical control groups (i.e. anxiety and somatoform; $k = 1$; Rockenberger & Brauchle, 2011). Effect sizes were large ($d = 0.83 - 1.10$). However, no difference in character shame was reported in relation to ED versus affective, stress/mixed anxiety, depression, and personality disorder group comparisons (Rockenberger & Brauchle, 2011). Other studies focused on behavioural shame (defined as shame related to actions and behaviours), but did not identify significant differences between ED, healthy control and recovered ED control groups ($k = 1$; Swan & Andrews, 2003), nor other clinical control groups ($k = 1$; Rockenberger & Brauchle, 2011). However, behavioural shame may be considered more similar to the concept of guilt, than shame.

Within-group comparison studies.

Three within-group studies considered the role of shame in relation to ED symptom severity (Doran & Lewis, 2012; Keith et al., 2009; Kelly & Carter, 2013). All studies reported a significant relationship between shame and ED symptom severity (as measured by the Eating Disorder Risk Composite, EDRC; Garner, 2004; Eating Disorder Diagnostic Scale, ED DS; Stice, Telch, & Rizvi, 2000; and Eating Disorder Examination-Questionnaire, EDE-Q; Fairburn & Beglin, 1994; respectively), with associations ranging from moderate to large

($r = .26 - .70$; $p < .05$). These associations were similar across different subtypes of shame (character, behaviour, body, eating; based on Experience of Shame Scale, ESS, subscales; Andrews, Qian, & Valentine, 2002; Keith et al., 2009). These relationships remained after various covariates were controlled for including depression and parenting style received, although effect sizes were smaller, $\beta = -.23$. Bodily shame was reported to be uniquely predictive of EDRC scores in an ED clinical sample ($\beta = .32$), when controlling for behavioural and character shame (Doran & Lewis, 2012).

Longitudinal study.

One longitudinal study tested whether bodily shame and general shame predicted AN and BN symptoms following a 2.5-year period, adjusting for depressive symptoms, but did not find a significant longitudinal relationship (Troop & Redshaw, 2012). However, current “bodily shame” (as measured at baseline by the Bodily Shame Scale, BSS; Troop, Sottrilli, Serpell, & Treasure, 2006; p.375), but not general shame, was uniquely predictive of AN severity at follow-up ($\beta = .45$, $p < .01$) whilst adjusting for baseline AN severity. Body shame scores were also uniquely predictive of “misperception of body size” ($\beta = .35$; p.376) and how far below a body mass index (BMI) of 19 an individual was ($\beta = .34$). Anticipated body shame scores were uniquely predictive of “fear of weight gain” ($\beta = .42$; p.376).

Guilt

Between-group comparison studies.

Five studies considered the role of guilt in AN and/or BN through between-group comparisons (Allen et al., 1998; Berghold & Lock, 2002; Kollei, et al., 2012; Rockenberger & Brauchle, 2011; Yellowlees, 1985). Two studies reported no significant difference between ED presentations (including AN & BN) versus other clinical diagnoses (Rockenberger & Brauchle, 2011) and healthy controls (Kollei et al., 2012). A third study reported no

significant difference between an ED group and a non-clinical group on three areas of guilt (survivor, separation and omnipotent responsibility guilt; Berghold & Lock, 2002).

Conversely, one study reported a significant difference between a BN and a non-clinical control group (Allen et al., 1998; $p < .05$; effect size could not be calculated). However, this study utilised the Buss-Durkee Inventory (BD-I; Buss & Dukee, 1957) which has been queried as measuring both guilt and shame, as it contains items pertaining to both emotions (Tangney, Wagner, Fletcher, & Gramzow, 2001). A significant difference was also reported between groups in relation to self-hate guilt ($p < .05$, $d = 0.48$), but this construct also appears to conceptually overlap with shame.

Kollei et al. (2012) reported a significant difference between AN and BN, and healthy control groups ($d = 1.23 - 1.25$) when considering body related guilt. When comparing AN binge-purge and AN restrictive groups, the former reportedly exhibited greater levels of guilt (Yellowlees, 1985).

Within-group comparison studies.

One study identified a significant association between guilt and BN (Allan et al., 1998). However, this study relied on the use of the BD-I to measure guilt, and therefore results may be indicative of the measurement of both guilt and shame (Tangney et al., 2001).

ESM studies.

Two studies used ESM to map prospective relationships between momentary assessments of guilt in those with BN or AN/BN presentations (Berg et al., 2013; De Young et al., 2013). ESM is a methodology which captures self-report data on a momentary basis. Participants are typically required to record their experiences at several, researcher defined time-points. Whilst Berg et al. (2013) reported a significant elevation in levels of guilt prior to binge only, purge-only and binge-purge events (all $p < .01$), both papers reported significant

reductions in guilt post-binge eating. Berg et al. also reported reduced guilt following purge only and binge-purge events. Guilt elevation and reduction pre and post binge/purge events were also significant ($p < .001$) when controlling for fear, hostility and sadness (Berg et al. 2013). De Young et al. (2013) reported that those with BN reported a significantly greater reduction in momentary guilt post-binge episode than those with AN. Moreover, those who did not induce vomiting reported a greater reduction in guilt than those who did induce vomiting.

Discussion

The current review aimed to evaluate the relationship between shame, guilt and ED symptomatology in those with clinical presentations of AN and BN. It was anticipated that shame and guilt would be associated with AN and BN. It was also anticipated that this association would be greater in relation to shame.

The reviewed papers collectively indicated that greater levels of shame were experienced by those diagnosed with AN and BN, when compared to other groups (healthy controls, recovered ED cases and clinical groups). Furthermore, as symptoms of AN and BN increased, so did reported levels of shame. No significant differences in levels of general shame were reported between AN and BN groups. Differences were apparent between AN/BN groups versus comparators for character, eating and body-related shame, but findings were inconsistent for behavioural shame. However, negative feelings regarding behaviour arguably draw more parity with the concept of guilt (Tangney & Dearing, 2002). When considered in this vein, these findings support other studies included within the review which largely reported no differences between AN and BN, and comparator groups with regards to guilt. This is consistent with suggestions that those with ED presentations experience more negative feelings towards themselves (shame) in relation to their eating and body than negative feelings towards their behaviours (guilt; Sanftner et al., 1995).

No significant differences in bodily shame were found between those with current AN/BN diagnoses and those considered recovered. This suggests that bodily shame is maintained upon recovery. Bodily shame was also found to be uniquely predictive of AN, but not BN, when controlling for general shame and depression. Whilst limited to a single study (Troop & Redshaw, 2012), longitudinal data does suggest that some forms of shame may account for the subsequent severity of AN symptoms, increasing the plausibility that shame is a mechanism leading to AN. However, inferences of causality cannot be made as

yet. No such longitudinal associations were apparent for BN symptoms (though the follow-up period was long) and there is greater uncertainty about whether shame is simply a consequence or epiphenomena of BN, rather than a driving factor.

Those with AN and BN diagnoses were reported to have similar levels of guilt as comparison groups, taking into account various forms of guilt (e.g., general and body-related guilt). An exception was self-hate guilt, which was greater in ED samples than controls. However, self-hate is arguably more related to the concept of shame (O'Connor, Berry, & Weiss, 1999). In contrast to the group-comparison studies, within-study associations between guilt and ED symptoms were reported in individuals with BN by one study. Moreover, prospective associations between changes in guilt and ED-related behaviours (binges and purges) were identified in ESM studies. It may be that guilt does not tend to be reliably elevated in those with AN or BN compared to non-clinical or other clinical groups. Instead, within AN and BN samples, fluctuations in guilt may still play a role in maintaining or driving specific ED symptoms. This may explain why AN does not appear to be significantly related to guilt, yet AN binge-purge sub-type was found to be more strongly associated with guilt than an AN restrictive sub-type. Tangney and Dearing (2002) suggest that guilt is associated with negative evaluations regarding specific behaviours.

The observed prevalence of body related guilt and shame in AN and BN groups, is suggestive of the propensity to engage in global self-devaluations on the basis of physical appearance (Rosen, 1992; Tangney & Dearing, 2002). The current review is reflective of previous research which has identified greater levels of shame in those with other ED presentations (e.g., binge-eating disorder; BED) when compared to general population and other clinical groups (e.g., Masheb, Grilo, & Brondolo, 1999). The review also supports research reporting a positive correlation between ED symptom severity and shame in sub-clinical groups (e.g. Sanftner et al., 1995). Shame may be implicated in the onset of ED

presentations, as the associated behaviours may be considered attempts to avoid such negative feelings towards the self (Goss & Gilbert, 2002; Polivy & Herman, 1993). The impossibility of maintaining attempts to control dietary intake and weight may lead to further shame and in turn a maladaptive shame-ED cycle (Goss & Gilbert, 2002; Skårerud, 2007). The findings of the current review are consistent with Oluyori's (2013) qualitative review, which concluded that shame was implicated in the onset and maintenance of general ED presentations. An alternative explanation is that, as EDs are highly stigmatised (e.g., Zwickert & Rieger, 2013), shame is a product rather than cause of the ED. The lack of longitudinal data makes it impossible to establish the direction of this relationship, and a reciprocal temporal relationship between shame and ED is also plausible.

Within this review, guilt was identified as elevating before, and reducing after, binge, binge-purge and purge events. This appears to support Polivy and Herman's (1993) suggestion that negative affect elevates before, and reduces after, binge-eating and vomiting. Binge-eating and purging may therefore be seen as a means of counteracting negative affect (i.e. guilt; Haedt-Matt & Keel, 2011). Research suggests that those with BN may be more reactive to negative affect than those with AN presentations (Forbush & Watson, 2006). However, emotional reactivity may be a common characteristic of those who engage in binge-eating and purging and this facet of ED can be present in both BN and, to a lesser extent, AN presentations. Interestingly, lack of purging (self-induced vomiting) was associated with greater reductions in guilt post-binge eating. Therefore, the onset of binge/purge behaviours may not only be associated with general and/or bodily guilt, but also guilt specifically resulting from previous binge/purge behaviours. Evidence gleaned from reviewed ESM studies appears to refute Oluyori's (2013) conclusion that guilt is merely the consequence of ED presentations.

To conclude, evidence from the review appears to support research suggesting that ED presentations are more prominently associated with negative feelings regarding the self (i.e. shame), than negative feelings regarding behaviour (i.e. guilt; Burney & Irwin, 2000; Sanftner et al., 1995). However, experiences of guilt may be more typically associated with the engagement in binge/purge behaviours, rather than specific ED presentations.

Future research would benefit from considering EDs in terms of symptoms, as opposed to diagnostic categories. Whilst consideration of clinically diagnosed ED groups may be beneficial (providing an indication of presentation severity), classification may be considered arbitrary, with many symptoms being trans-diagnostic (Dudek, Ostaszewski, & Malicki, 2014). Moreover, consideration of those at differing levels of a continuum of ED symptoms may be beneficial, and help to inform preventative interventions and strategies. The majority of papers included within the review were cross-sectional in nature and utilised self-report measures. The results may therefore be subject to inherent bias due to issues associated with retrospective measures (Shiffman et al., 1997). More recently, research has begun to employ ESM designs to explore the aetiology of ED presentations. Continued research in this vein may be informative and help to diminish methodological issues identified in the existing research. A further limitation was the lack of consideration of confounding variables within the papers reviewed. Only six papers considered the confounding influence of depression/low mood, and no papers were identified as accounting for guilt when measuring shame, and vice versa. Future research should also consider the potential co-occurrence of guilt and shame and control for this, in addition to depression.

The current review did not consider papers which were unavailable in English. This may therefore have resulted in a biased selection of the literature and an incomplete account of the association between shame, guilt, and AN/BN clinical groups. Moreover, although arguably beneficial due to the dearth of literature considering specific AN and BN

presentations, the paper did not consider ED presentations at other stages of the ED continuum (Leung & Price, 2007). Consideration of sub-clinical groups may have provided further insights in terms of guilt and shame in relation to AN and BN symptom severity. The current review provides support for the role of shame and guilt in AN and BN presentations. It appears that affect regulation may be implicated in the maintenance of these eating difficulties. Therefore, it may be important to consider negative affect and more specifically guilt and shame when developing interventions for these clinical groups. This may be particularly true, given that bodily shame does not appear to remit once an individual is considered to be recovered.

Whilst current treatment approaches (e.g. CBT) commonly target maladaptive cognitions and behaviours, there is an indication that emotions such as shame may benefit from therapeutic attention. BN is more typically associated with binge/purge behaviours. As this is associated with guilt it may in part explain why treatment is more efficacious in this group, as guilt is more easily resolved than shame (Tangney, 1995). Moreover, as AN presentations appear to be predominantly characterised by shame, this may explain why they are considered more persistent and resistant to treatment. Compassion focused therapy (CFT), an approach which focuses upon developing self-compassion, affect regulation and distress tolerance, may be beneficial to those with AN and BN presentations. It has been found to be useful in the treatment of other psychological presentations characterised by high levels of shame (e.g. Leaviss & Uttley, 2015). As high levels of shame have been identified in those with AN and BN presentations, they may withhold information pertaining to their presentation. Therefore, the development of an effective therapeutic relationship may be of particular importance in these clinical groups (Chakraborty & Basu, 2010). Those who display high levels of guilt, and in particular those who engage in binge/purge behaviours, may also benefit from interventions which focus upon distress tolerance and affect

management. However, at present these findings are tentative due to the methodological limitations identified within the studies reviewed.

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Chapter 3

Empirical Study

Shame, Social Comparison and Eating Disorder Symptomatology: An Experience

Sampling Methodology (ESM) Study¹

¹ Word count: 5935

Empirical Study Preface

The following research paper forms part of a wider project exploring the relationship between social comparison, motivation, affect and psychopathology using an Experience Sampling Methodology (ESM). This was a collaborative project between researchers at the Universities of Lancaster, Liverpool, and Manchester. Three distinct doctoral research projects formed part of this collaboration. Whilst one methodology was utilised for the three projects, each had distinct aims and research questions. As a single set of measures was utilised, recruitment was completed by the three research project authors and the data obtained was pooled. Each project author aimed to recruit $N=30$ participants each. This facilitated the recruitment of a larger overall sample size ($N=89$). Whilst data was also collected by researchers at the Universities of Manchester and Liverpool, this data did not contribute to the following research paper.

Despite the utilisation of a singular methodology and co-recruitment, the following paper was independently written by the named author. No input was received from the aforementioned investigators. This included the development of the research question, background research, data analysis and conclusions drawn. The following paper was however supported by the author's supervisors.

Abstract

Objectives: This study tested the role of momentary shame and social comparison in relation to aspects of eating disorder (ED) symptomatology, in a non-clinical student population.

Method: An experience sampling methodology (ESM) was utilised over a period of six days, to gather momentary data related to shame, social comparison and attempts to control eating. Eighty-nine university students participated.

Results: Concern regarding eating was found to be a significant predictor of momentary shame. Momentary shame was found to be a significant positive predictor of momentary attempts to control eating.

Conclusions: Momentary shame appears to play an important role in ED symptomatology. Clinical interventions which focus on this emotion (e.g. compassion-focused therapy) may be beneficial. Interventions that operate on a momentary basis may also be of value.

Keywords: Shame; Social comparison; Affect; Eating disorder; Experience sampling methodology (ESM).

Introduction

Eating disorders (EDs) are characterised by disturbances in eating behaviours, which may include the refusal to maintain a normal body weight and fear of gaining weight, episodes of binge eating, and inappropriate methods of preventing weight gain (e.g., purging following meals/binges, excessive exercise and laxative/diuretic misuse; American Psychiatric Association, 2013; Burney & Irwin, 2000). Eating disorders have been associated with poor long-term prognoses and significant costs for both the individual and society (Collings & King, 1994; Lampard & Sharbanee, 2015; PricewaterhouseCoopers, 2015; Steinhausen, 2002). Although arguably necessary for the development of effective intervention methods, the aetiology of disordered eating behaviour is not well understood (Cooper, 2012; Corning, Krumm, & Smitham, 2006; Jansen, 2001). The current study focuses upon shame, a putative mechanism underlying ED presentations. It also considers social comparison in a non-clinical sample. Both shame and negative social comparison have been associated with feelings of defectiveness and inferiority, which are common features of ED presentations (Duarte, Pinto-Gouveia, & Ferreira, 2014; Pinto-Gouveia, Ferreira, & Duarte, 2014). Whilst shame and social comparison are discrete emotions and processes that operate in the moment, research has tended to rely on retrospective assessments of these constructs. Consideration of these mechanisms at the momentary level in relation to ED symptom severity, may further understanding regarding ED presentations and contribute to the development of efficacious approaches to prevention and treatment.

Prevalence rates of classifiable EDs are reportedly greater in university settings than in the general population (4-9% compared to 0.5-4.2%; American Psychiatric Association Work Group on Eating Disorders, 2000; Hesse-Biber, Marino & Watts-Roy, 1999) and with the inclusion of sub-clinical eating disturbances, prevalence rates in the former have been reported at 34-67% (Mintz & Betz, 1988; Mintz, O'Halloran, Mulholland, & Schneider, 1997; Shisslak, Crago & Estes, 1995). It is thus deemed important to consider the

mechanisms that underlie eating disturbances (i.e., shame and social comparison) within this population. As such, the current study focuses on a non-clinical sample.

Cognitive models, which implicate erroneous thoughts and cognitive distortions, have largely dominated explanations of EDs (Waller & Kennerley, 2003). Whilst cognitive-behavioural therapy (CBT) is reportedly associated with improved outcomes, many individuals with ED presentations continue to present with difficulties following intervention (Cooper, 2012; Fairburn et al., 1995; McIntosh et al., 2005). It is argued that, whilst important, cognitive explanations of ED presentations are currently insufficient and therefore compromise the efficacy of the treatments they underpin (Cooper, 2005, 2012; Waller & Kennerley, 2003).

The role of affect and affect regulation has been associated with ED behaviours, and is increasingly considered important (Frank, 1991; Heatherton & Baumeister, 1991). Affect regulation models propose that behaviours associated with ED presentations (e.g., binge eating, purging, and caloric restriction) facilitate the avoidance of negative affect and/or increase positive affect (Haynos & Fruzzetti, 2011; Polivy & Herman, 1993). Such behaviours are deemed to be maintained through negative reinforcement (Haynos & Fruzzetti, 2011; Polivy & Herman, 1993). Whilst cognitive models now incorporate some consideration of the role of emotion in ED presentations (e.g., Cooper, 2012; Cooper, Wells, & Todd, 2004), they do not appear to offer an adequate explanation of the role of shame. Moreover, CBT approaches do not specifically target such negative emotions (Goss & Allan, 2009).

Limited research has considered the role of both shame and social comparison in ED presentations. Shame is a complex self-conscious emotion which involves global evaluations of the self as flawed and the perception that others make equally negative evaluations about the self (Goss & Allan, 2009; Tangney & Dearing, 2002). Shame has been implicated in a number of psychological presentations, such as depression and a range of anxiety disorders

(Fergus, Valentiner, McGrath, & Jencius, 2010; Kim, Thibodeau, & Jorgensen, 2011). Whilst the experience of shame is reportedly higher in those with ED presentations than other clinical groups (Frank, 1991; Masheb, Grilo, & Brondolo, 1999), less is known about its role in EDs (Burney & Irwin, 2000). Although distinct concepts, shame is often associated with guilt (Tangney & Dearing, 2002). Research should therefore arguably consider guilt when studying shame.

Shame is commonly linked to social comparison (Goss & Allan, 2009). According to social comparison theory (Festinger, 1954), self-uncertainty encourages comparisons of the self with others. Comparisons with others may be considered functional, as they may enable a person to conform to perceived societal ideals (e.g., thinness) and in turn feel valued and accepted by others (Goss & Allan, 2009; Goss & Gilbert, 2002). However, negative social comparisons and perceived low social rank have been associated with distress and negative affect (e.g., shame; Goss & Allan, 2009; Luyten et al., 2007). Like shame, social comparison has therefore also been implicated in ED symptom severity (Corning, Krumm, & Smitham, 2006; Troop, Allan, Treasure, & Katzman, 2003). This is perhaps demonstrated by evidence that women with ED symptoms are more aware of body/weight related information in the social environment (Beebe, Holmbeck, Schober, Lane, & Rosa, 1996). Inasmuch as shame concerns a feeling of inferiority relative to others, shame and negative social comparison could be seen as the emotional and cognitive sides, respectively, of the same process of negative self-evaluation.

Feelings of shame and negative social comparison may contribute to the maintenance of ED behaviours and concerns. Attempts to control a particular aspect of one's life (i.e., eating and weight) may facilitate improved self-evaluations and reduced shame (Goss & Gilbert, 2002). Dietary restriction and issues of control are central to most ED presentations (Fairburn & Harrison, 2003). Successful dietary and weight control may result in the experience of pride and improved affect, particularly when comparisons are made with others

(Gilbert, 1998; Goss & Allan, 2009; Skårerud, 2007). However, the impossibility of maintaining a high-level of dietary and weight control, or of meeting unrealistic standards, may ultimately result in further shame, forming a maladaptive cycle (Goss & Gilbert, 2002; Skårerud, 2007). Whilst theoretically shame and negative social comparisons may prompt attempts at control, little research has considered this potential association.

Investigations of the symptomatic structure of EDs suggest that a number of symptomatic dimensions may exist (e.g., Williamson et al., 2002). Whilst the extent to which these dimensions map onto current diagnostic categories is unclear, it has been noticed that such symptoms may emerge at a sub-clinical level in the wider population and that these subclinical presentations may be a risk factor for future development of ED pathology (e.g., Beals & Manore, 1999; VanBoven & Espelage, 2011). Gaining an understanding of the mechanisms underlying ED psychopathology, particularly at differing levels along an ED continuum, may encourage the development of early targeted interventions and prevention. In the current study, focus is placed upon key symptom dimensions related to ED presentations (as defined in the Eating Disorder Examination Questionnaire 6.0; EDE-Q; Fairburn & Beglin, 2008), which likely exist on a continuum, but are elevated in clinical cases of EDs (Fairburn & Beglin, 2008; Luce, Crowther, & Pole, 2008; Mond, Hay, Rodgers, & Owen, 2006).

There is evidence to suggest that women with EDs are unlikely to report their personal experiences reliably (e.g., Brown, Russell & Thornton, 1999). Therefore, the ecological validity of reported data in research based on retrospective self-reports may have been compromised. Consequently, an alternative methodology is needed. Moreover, as shame and social comparison may be considered to be momentary experiences, it is important to consider them on this basis. Momentary research methods (i.e., experience sampling methodology; ESM) may be utilised to capture data in real-time and in naturalistic settings. ESM approaches have been associated with benefits which include improved ecological

validity and reduced recall bias. ESM may also facilitate improved understanding of psychological mechanisms as it enables temporal consideration of within-person data (Conner, Tennen, Fleeson, & Barrett, 2009; Scollon, Prieto, & Diener, 2003). To date ESM research exploring the role of emotion in ED presentations has focused on the role of guilt (Berg et al., 2013; De Young et al., 2013). The following research utilised ESM to consider the role of moment-to-moment shame and social comparison in ED psychopathology symptoms.

The current study aimed to investigate whether higher levels of eating disorder symptoms related to higher levels of momentary shame and social comparison.

Hypotheses

1. Participants with greater levels of ED symptoms will report greater levels of momentary shame.
2. Higher levels of momentary shame and social comparison will be associated with greater attempts to control eating.

The following research was part of a wider project examining the role of mood and goal processes within a variety of mental health difficulties.

Materials and Methods

Participants

A non-clinical student sample was recruited from two North-West England universities. This sample was employed as it was hoped it would facilitate consideration of ED symptomatology across a continuum of severity. Consideration of a non-clinical sample was consistent with other research which suggests ED experience may exist on a continuum (e.g., Leung & Price, 2007). Moreover, it offered an opportunity to consider the potential utility of preventative interventions for those identified as being at risk of future ED symptom escalation. The sample ($N=89$) comprised of 79 females and 10 males (M age= 22.9; $SD=4.8$). Participants described their ethnicity as: Caucasian (77.3%), Asian (13.6%), Other (4.5%), Black (3.4%) and Mixed (1.1%). One participant did not report their ethnicity. Three participants did not continue following the initial meeting and were therefore excluded from the total sample size ($N=89$): $N=2$ did not return at meeting two and $N=1$ did not proceed due to a broken mobile telephone.

Design

An experience sampling methodology (ESM) was utilised over a six-day period. ESM or ecological momentary assessment involves regular assessments, occurring several times in a day, which the participant is prompted to complete remotely (in this instance via text message). ESM helps to improve the reliability of self-reported information, because it is taken in the moment and does not rely on retrospective recall (Schwarz, 2007). This methodology potentially reduces the impact of recall bias.

Measures

Momentary-level.

Social comparison: Four items, taken from Allan and Gilbert's (1995) social comparison scale, considered social comparison. These items were developed via discussion with clinicians about common forms of social comparison in their clients. All items were prefaced with the

question: *How do you feel you compare to others at the moment?*. The four items were rated on a 7-point scale of -3 to 3, anchored at *inferior to superior*, *less competent to more competent*, *less talented to more talented*, and *less attractive to more attractive* respectively.

The items selected have been reported to have high factor loadings ($>.55$) in a student population (Allan & Gilbert, 1995). The internal consistency of this scale in the current sample was $\alpha = 0.76$.

Shame & Guilt: Four items assessed shame and four assessed guilt. Guilt was included because it often co-occurs with shame (Tangney & Dearing, 2002). Shame and guilt items were adapted from two sources: 1) the Positive and Negative Affect Schedule Expanded Form (PANAS-X; Watson & Clarke, 1994; e.g., *ashamed*), which has been validated in a student sample, and 2) the State Shame and Guilt Scale (SSGS; Marschall, Sanftner, & Tangney, 1994; e.g., *like a bad person*). The SSGS has been found to have high internal reliability, as well as predictive and convergent validity in student samples (Tangney & Dearing, 2002). All shame and guilt items utilised in the current study were prefaced with the phrase *I feel*. Participants were asked to respond to all shame and guilt items using a seven-point Likert scale anchored at 1 = *Not at all* and 7 = *Very much*. The internal consistency of the shame and guilt measures in the current sample were $\alpha = 0.72$ and 0.84 respectively.

Control: One item, generated by the investigatory team, related to the perception of control over eating: *Since the last prompt I have tried to control my eating*. Participants were asked to respond using a seven-point Likert scale anchored at 1 = *Not at all* and 7 = *Extremely*. Although this item was not subjected to tests of validity and reliability, it was deemed to have face validity.

Momentary items utilised within this study may be found in Appendix B.

Person-level.

Demographics: At the initial meeting, information regarding participants' age, gender and ethnicity was collected.

Eating disorder symptoms: The Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 2008) was the main dependent variable of the study and was used to assess degree of eating disorder symptomatology within participants. The EDE-Q is a commonly used self-report measure which contains 33 items (30 if completed by males; e.g., *on how many of the past 28 days have you felt fat?*). The EDE-Q considers the occurrence of behaviours and attitudes commonly associated with ED presentations, during the previous 28-day period. The measure is broken down into four subscales, each exploring the severity of different aspects of ED presentations: restraint (five items consider avoidance, restraint and rules regarding dietary intake), shape concern (five items consider beliefs, concerns and feelings regarding body shape), weight concern (eight items consider weight preoccupations, dissatisfaction and importance), and eating concern (five items consider eating behaviours, preoccupation and feelings regarding eating). Higher scores are deemed to signify greater symptom severity. It also comprises a group of items considering the frequency of behaviours commonly associated with ED presentations, as well as questions regarding height and weight. The EDE-Q utilises a number of different response formats, including Likert scales, opened-ended questions and yes/no questions. Several studies have demonstrated the reliability and validity of the EDE-Q in both clinical and student samples (e.g., Aardoom, Dingemans, Op't Landt, & Van Furth, 2012; Berg, Peterson, Frazier, & Crow, 2012; Rose, Vaewsorn, Rosselli-Navarra, Wilson, & Weissman, 2013). Within the current study, the four sub-scale scores were utilised. The internal consistency of the four subscales was good (restraint: $\alpha = 0.84$; eating: $\alpha = 0.79$; shape: $\alpha = 0.91$; weight: $\alpha = 0.81$).

Body mass index (BMI; a calculation based on height and weight measurements) was also calculated.

Depression: Previous research has identified a link between general shame, bodily shame and depression (e.g., Andrews, 1995). Therefore, the Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996) was utilised to control for depression in participants. The BDI consists of 21 items which explore the experience of negative affect/symptoms of depression (e.g., pessimism, suicidal thoughts, and sadness) within the two weeks prior to completion. Items are rated on a four-point Likert scale of graded severity. The BDI has been shown to demonstrate both reliability and validity in a student sample (Dozois, Dobson, & Ahnberg, 1998). The internal consistency of this scale in the current sample was $\alpha = 0.89$.

Procedure

Participants were recruited via poster advertisements placed around campus, electronic notice boards and student mailing lists. All participants were students, over 18 years old and fluent in English. Regular access to a mobile telephone was necessary in order to participate in the study. A UK survey suggested that 100% of students had access to some form of mobile device (Rebenich, Gravell, & Tiropanis, 2010). Participants were remunerated with £15 worth of gift vouchers upon completion of the research protocol and entered into a £50 gift voucher prize draw. Two forms of remuneration were utilised to compensate for the potentially burdensome nature of the study design.

Ethical approval for the study was obtained from institutional ethics committees at the two Universities. Those who responded to study advertisements were invited to meet the investigator in a booked meeting room within the University where the study took place. During this meeting, the study and ESM methodology were explained, and participants were given an information sheet and the opportunity to ask questions. Consent was taken from those who chose to proceed with the study. All participants were made aware that they were entitled to withdraw from the study at any point in the research protocol including withdrawing their data up until the point where it was made anonymous (following the second meeting).

At the initial meeting, participants were asked to complete the Beck Depression Inventory-II (BDI-II; Beck et al., 1996). Participants were also given six A6 sized ESM diaries (one per day), which they were asked to keep with them and complete for six days. Each diary comprised of six double-pages of ESM items (see Appendix B). Over the course of the six-day assessment period, participants received six text messages at pseudo-random times between 10am and 10pm instructing them to complete their ESM diaries. It was anticipated that diary completion would take no more than five minutes. Text messages were sent via an automated alert system (appointmentsms.co.uk) and participants received six text prompts per day. The investigator contacted participants by telephone during day one, to answer questions and resolve problems. All participants were provided with the telephone number of the investigator and invited to make contact should they experience any difficulties.

At the end of the six-day ESM data collection period, all participants were invited to meet the investigator once again. At this point, diaries were collected and participants were asked to complete the Eating Disorder Examination Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 2008). As the EDE-Q requires participants to report their height and weight, a measuring scale and tape measure were utilised to take these measurements from all participants. All participants consented to their height and weight being taken.

Participants were debriefed and an information sheet was provided. This provided details regarding eating disorders, and the medical dangers of bingeing, vomiting, laxative and diuretic misuse and low weight. Signposting information for mental health and support services was also provided. The opportunity to speak to a qualified clinical psychologist (to assist in signposting to relevant sources of support) was made available should personal issues have arisen from participation in the study. However, no participants reported distress during or following participation in the study.

Participants were asked to complete the aforementioned momentary shame, guilt and social comparison measures when prompted by text alert (six times daily) during the six-day ESM period. Participants completed the BDI during the first meeting, and the EDE-Q at the second meeting with the investigator.

Sample Size

Power calculation for multi-level models is complex because power relies on a potentially large number of parameters, including the values of the various random effects or variance components within the model and the number of level-1 units nested within each level-2 unit (Snijders & Bosker, 2012). Rules of thumb do, however, exist regarding required sample sizes in multi-level modelling. Snijders and Bosker (2012) suggest an $N \geq 30$ is adequate for non-biased significance tests of fixed effects. Similarly, 30 level-2 units with 30 level-1 units per cluster has also been suggested (Kreft, 1996), although fewer level-1 units per cluster may be necessary (Kwok et al., 2008). A minimum sample size of $N=30$, with 36 time points within each level-2 unit was therefore chosen.

Analysis

IBM SPSS Statistics 22 (IBM Corp., 2013) data analysis software was utilised to compute means, standard deviations and Spearman correlations of the person-level study variables (i.e. EDE-Q sub-scale scores). BMI and BDI scores were also included.

Stata 14 (StataCorp, 2015) data analysis software was utilised to consider hypotheses 1 and 2. Data was analysed using multi-level regression models to account for the two levels of data collected (i.e., time-points nested within people; Snijders & Bosker, 2012). Standard regression techniques were not appropriate because the nested structure of the data would have violated assumptions of independence. The variables included were: Hypothesis 1: Independent variable (IV): four EDE-Q subscales; dependent variable (DV): shame. Hypothesis 2: IV: shame, social comparison and guilt; DV: control. Shame data was highly positively skewed (most people at any given time point did not experience shame). The

control variable also suffered from positive skew and high kurtosis as most respondents reported either no attempts to control eating or a medium amount of control at any given time point. Both shame and control were therefore dichotomised so that scores 1-4 = 0 and 5-7 = 1. As a result, scores of 1 represent unusually high levels of shame or attempts at control. For consistency, guilt was also dichotomised so that scores 1-4 = 0 and 5-7 = 1. As analyses included dichotomised data, logistic multi-level regression models were utilised. Both depression and guilt were controlled for in these analyses.

Missing data is common within ESM studies (Snijders & Bosker, 2012). Missing data was 27.14% and 28.96% in relation to hypotheses 1 and 2 respectively. This level of missing data is not deemed to be high for ESM studies (Beal, 2015; Colautti et al., 2011). Moreover, missing data is not considered problematic for multi-level modelling analyses as cases with incomplete data at the momentary-level can still be used in the analyses (Snijders & Bosker, 2012).

Results

Characteristics

EDE-Q restraint and weight sub-scale mean scores and standard deviations (see Table 2.1) were higher in the current sample when compared to EDE-Q community norms (restraint: $M=1.25$, $SD=1.32$ to $M=1.34$, $SD=1.39$; weight: $M=1.59$, $SD=1.37$ to $M=1.90$, $SD=1.51$; Fairburn & Beglin, 1994; Mond et al., 2006). This suggests that the current sample exhibited more dietary restraint and weight concern than other non-clinical samples. EDE-Q eating and shape sub-scale mean scores and standard deviations were within the same range as reported community norms (eating: $M=0.61$, $SD=0.94$ to $M=0.87$, $SD=1.13$; shape: $M=2.10$, $SD=1.60$ to $M=2.37$, $SD=1.65$; Fairburn & Beglin, 1994; Mond et al., 2006). However, it should be noted that available norms relate to female only samples (Fairburn & Beglin, 1994; Mond et al., 2006).

Correlations between person-level variables revealed significant positive bivariate relationships between the four EDE-Q subscales ($p<.01$; see Table 2.1). Three of the EDE-Q subscales (restraint, eating concern, and shape concern) were also positively associated with control scores ($p<.01$). Three of the EDE-Q subscale scores (eating, shape and weight concern) were positively associated with BDI scores ($p<.05$).

Table 2.1.

Mean Scores, Standard Deviations and Correlations of Person-level Measures

	EDE-Q Restraint	EDE-Q Eating Concern	EDE-Q Shape Concern	EDE-Q Weight Concern	BDI	BMI
<i>M (SD)</i>	1.63 (1.44)	0.89 (0.90)	2.32 (1.54)	1.97 (1.42)	10.47 (8.06)	24.04 (4.90)
EDE-Q Restraint		.57**	.66**	.72**	.07	.16
EDE-Q Eating Concern			.67**	.73**	.27*	.01
EDE-Q Shape Concern				.87**	.37**	.07
EDE-Q Weight Concern					.34**	.13
BDI						-.14
BMI						

Note. * $p < .05$; **; $p < .001$; EDE-Q = Eating Disorder Examination Questionnaire 6.0; BDI = Beck Depression Inventory-II

Hypothesis One

Within the analysis there were 2413 observations of a possible 3312 (72.86%). Model 1 (see Table 2.2) considered the four EDE-Q subscales (restraint, eating concern, shape concern and weight concern) as predictors of momentary shame. The EDE-Q eating concern sub-scale was found to be the only significant predictor of momentary shame (Model 1; see Table 2.2). When momentary guilt scores and person-level BDI scores were controlled for (Model 2; see Table 2.2), eating concern remained the only significantly predictive EDE-Q sub-scale. Guilt and BDI scores were also significantly predictive of momentary shame (Model 2; see Table 2.2). Model 2 was an improvement over Model 1 in terms of predicting the risk of experiencing shame ($\chi^2=256.38$; $p \leq 0.00$). As eating concern continued to be significantly predictive of momentary shame, this facet appeared to be of particular

importance. In Model 2, a unit increase in eating concern was associated with double the odds of reporting shame at any moment, keeping other variables constant.

Table 2.2

Logistic Multi-Level Regression with Momentary Shame as Outcome

Predictors	OR	95% Confidence Interval	
<i>Model 1</i>			
EDE-Q Restraint	0.77	0.46	1.28
EDE-Q Eating Concern	2.10*	1.02	4.31
EDE-Q Shape Concern	1.07	0.53	2.15
EDE-Q Weight Concern	1.00	0.45	2.23
<i>Model 2</i>			
EDE-Q Restraint	1.01	0.69	1.46
EDE-Q Eating Concern	2.09*	1.25	3.50
EDE-Q Shape Concern	0.76	0.46	1.26
EDE-Q Weight Concern	0.87	0.49	1.55
Guilt	20.03**	13.76	29.14
BDI	1.10**	1.05	1.17

Note. * $p < .05$; **, $p < .001$; OR = Odds Ratio; EDE-Q = Eating Disorder Examination Questionnaire 6.0; BDI = Beck Depression Inventory-II

Hypothesis Two

Multi-level logistic regression was utilised to consider whether momentary shame (dichotomised) and momentary social comparison were associated with greater levels of momentary attempts to control eating. All momentary data was obtained from ESM diary items. Momentary guilt (dichotomised) was also considered as an independent variable due to its close association with shame. Within the analysis there were 2353 observations of a

possible 3312 (71.04%). The model explained significant variance within participants' control scores ($\chi^2=10.76$, $p<.05$).

Table 2.3.

Logistic Multi-Level Regression with Momentary Attempts to Control Eating as Outcome

Predictor	OR	95% Confidence Interval	
Guilt	0.48**	0.31	0.77
Shame	1.57*	1.04	2.37
Social Comparison	1.02	0.95	1.09

Note. * $p<.05$; **; $p<.001$

Momentary guilt and shame were identified as being significant predictors of momentary attempts to control eating (see Table 2.3; $p>.01$ and $.05$ respectively). Momentary social comparison was not identified as a significant predictor of momentary attempts to control eating. The strongest odds ratio was identified in relation to momentary shame as a predictor of attempts to control eating. Momentary guilt was related to lower odds of substantive momentary attempts to control eating, whilst shame was related to greater odds of substantive momentary attempts to control eating.

Discussion

Summary

This study aimed to test the relationship between the experience of momentary shame and ED symptom severity in a non-clinical student population. It also aimed to test the relationship between momentary shame and social comparison, and attempts at controlling dietary intake in this group. Hypothesis one (greater levels of ED symptom severity would be associated with greater momentary shame) was partially supported. Results indicated that eating concern was the only significant predictor of momentary shame amongst the forms of ED symptomatology measured. This association remained, even when guilt and depression were considered within the model. Both guilt and depression were found to be significant predictors of momentary shame. Hypothesis two (higher levels of momentary shame and social comparison, would be associated with greater levels of momentary attempts to control eating) was partially supported. Whilst shame and social comparison were both positively associated with attempts to control eating, only shame was found to be a significant predictor. Guilt was included within the model because it is commonly associated with shame. Guilt was also found to be a significant predictor of attempts to control eating. Interestingly, it appeared that greater levels of momentary guilt were predictive of reduced momentary attempts to control eating, whilst, greater levels of shame appeared to be associated with greater levels of momentary attempts to control eating.

Contribution to Existing Research

As noted in cross-sectional research studies, an association between ED symptomatology and the experience of shame has been repeatedly identified (e.g., Burney & Irwin, 2000; Sanftner, Barlow, Marschall, & Tangney, 1995). However, the current research builds upon previous evidence. Eating concern in particular, was identified as being predictive of the experience of shame in the moment. Moreover, momentary shame was

identified as being a significant predictor of attempts to control eating. This finding offers support for affect regulation models (Haynos & Fruzzetti, 2011; Polivy & Herman, 1993), and indicates that individuals within the study may have attempted to control their eating, in order to alleviate the experience of shame. However, as experiences of shame and attempts to control eating were considered within time-points, and not between time-points, the direction of this effect could not be established. It is possible, for example, that ED symptomatology resulted in the experience of momentary shame, possibly due to the stigma that surrounds these difficulties (Roehrig & McLean, 2010), rather than vice versa. However, as the current research was completed with a non-clinical population, this conclusion is perhaps unlikely.

Eating concern was found to be the only ED sub-scale significantly predictive of momentary shame. This finding may be seen to support research indicating a link between eating and the experience of shame in ED groups (Frank, 1991). However, the current study only considered shame over a six-day period. Issues of shame related to eating may be more prominent within a short timeframe for non-clinical groups, than weight or shape concerns. For example, the average person eats several times throughout the day, however weighing oneself may be much less frequent; therefore, shame regarding eating may be more frequently occurring and consequently more easily detectable in a short time frame.

As noted in previous research, guilt and shame were found to be co-occurring (Sanftner et al., 1995). However, shame was found to increase with attempts to control eating, whilst guilt was found to reduce. This appears to support Tangney and Dearing's (2002) suggestion that shame is more problematic for psychological well-being than guilt. The current research suggests that this association is also true when considered on a momentary basis. As shame is associated with negative feelings regarding the self and a tendency to withdraw from others (Tangney & Dearing, 2002), it may result in attempts to control eating as a discreet method of restoring a sense of achievement or self-worth. This

may help to alleviate negative feelings regarding the self (e.g., body shape), without the requirement of actively acknowledging feelings of shame to the self or others. In contrast, guilt is often linked to reparative action. Individuals who experience feelings of guilt may be motivated to resolve them. By focussing on reparative action, focus on personal behaviours such as eating control may in turn diminish.

Guilt, shame and control were not considered in relation to diagnostic categories or common ED presentation types (e.g. restricting only; binge/purging; binge only). It is therefore not possible to say whether these momentary experiences vary in relation to presentation type. Nor is it possible to state whether guilt and shame have different effects in those who successfully attempt to control eating, versus those who do not. Finally, whilst shame and guilt may be considered predictive of attempts to control eating, attempts to control eating may also have contributed to feelings of shame and guilt. Firm conclusions regarding causation could not be made. No significant association was identified between social comparison and attempts to control eating, suggesting that emotional states may be more important than “cold” cognitive processes in driving attempts to control eating. This is understandable if attempts to control eating are seen as a coping strategy designed to alleviate negative feelings (Polivy & Herman, 2002).

Limitations

Although the current investigation considered shame, guilt and attempts to control eating on a momentary basis, it did not consider variations in ED symptomatology over time. Therefore, in terms of ED symptomatology, this investigation is comparable to cross-sectional studies. Moreover, it is subject to the same limitations as studies which rely on accurate self-report of ED symptoms (Brown et al., 1999). Future research may benefit from considering ED symptoms in the moment alongside emotional states. This may be challenging in non-clinical samples where ED related behaviours (e.g., bingeing, purging) may

have a low base rate. Whilst the aim of this investigation was not to consider diagnostic categories associated with eating difficulties, it would be helpful for future research to consider different presentation types (e.g., restricting, binge-eating and binge/purge presentations) in relation to shame and social comparison. This may help to facilitate greater understanding of the mechanisms underlying ED presentations and in turn, support the development of more effective treatments. At present, research indicates that treatment efficacy varies for different presentation types (e.g. Fairburn et al., 1995; McIntosh et al., 2005).

Compliance within the current study was difficult to ascertain. Participants were asked to record the times at which the diary was completed (so that this could be compared with the time text prompts were issued). However, as a paper based study, participants may have completed the diary retrospectively despite being encouraged not to do so. This limitation has also been noted in other paper-based ESM studies (e.g., Litt, Cooney, & Morse, 1998). Future research may benefit from utilising electronic methods of recording momentary responses. This may allow researchers to verify compliance. Moreover, it would be interesting for future research to consider the reasons for missing data. Missing data may have been of relevance to issues under investigation within the study (i.e. shame).

ESM is still a developing methodology and there are currently few psychometrically validated sets of ESM items. This is partly due to the challenges of psychometrically assessing ESM items (e.g., standard factor analytic methods are not appropriate for ESM data). In the current study, pre-existing validated ESM items, which adequately captured the constructs of interest, did not exist. Therefore, items were generated either from existing longer measures (social comparison, shame and guilt items), or through theoretical considerations and evidence of face validity (eating-control items). Such generation of items

is a general limitation of the ESM approach, but one which is balanced against the numerous advantages (e.g., less recall-bias and greater ecological validity; Schwarz, 2007).

Clinical Implications

Shame appears to play an important role in ED symptomatology, not only within clinical, but also sub-clinical groups. The identification of heightened shame experiences may therefore pose an opportunity to identify those at risk of developing ED difficulties in non-clinical group settings (e.g., schools/universities). Moreover, identified shame within clinical settings may have implications for assessment. For example, it is possible that an individual prone to high levels of shame may withhold information from the clinician, or report favourable outcomes and progress, in order to conceal perceived personal flaws or shame-inducing aspects of the self. At worst, lack of consideration of shame within clinical settings and interactions, may pose risk management implications. Consideration of shame and the development of effective therapeutic relationships may therefore be considered important (Chakraborty & Basu, 2010).

It would also seem appropriate for clinical interventions to focus upon the emotion shame. Compassion-Focused Therapy (CFT) is an example of a psychotherapy that specifically focuses on the problem of shame (Gilbert, 2009; 2010). CFT may therefore be considered particularly relevant for those presenting with ED symptoms. Moreover, interventions which focus upon helping individuals manage the experience of shame may be helpful in terms of ED presentation prevention. Consideration of the origin of shame may be important in terms of intervention strategies adopted. For example, family-based interventions could help to explore and restructure shame-inducing narratives around ED symptoms, and in turn, improve communication and openness with other family members, and enhance the support available to the individual (Frank, 1991; Le Grange, Lock, Loeb, & Nicholls, 2010).

As shame and guilt are implicated in behaviours associated with ED presentations (i.e., attempts to control eating) on a momentary basis, the development of momentary based interventions may be of benefit. These could include mobile-phone software applications which monitor mood and eating behaviour, and suggest appropriate interventions in the moment. Moreover, momentary based intervention methods, which prompt intermittent consideration of personal affect, may also help to promote improved self-awareness and affect tolerance (Heatherton & Baumeister, 1991). Evidence suggests that ecological momentary interventions are of benefit in relation to a variety of other psychological presentations (Heron & Smyth, 2011) although further research is needed.

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Chapter 4

Appendices

Appendix A: Full Text Papers Excluded from the Review and Reasons for Exclusion.

Table A1

Final Excluded Papers

Author and Year	Country	Reason for Exclusion
Bornholt et al. (2005)	Australia	Shame and guilt not measured independently
Cooper et al. (1988)	United States of America	Shame and guilt not measured independently
Corstorphine, Waller, Ohanian, and Baker (2006)	United Kingdom	Shame and guilt not measured independently
Duffy and Henkel (2016; published online 2015)	United States of America	No control or comparison of ED presentation sub-type or severity
Eversmann, Schoetke, and Wiedl (2007)	Germany	Unavailable in English
Ferreira, Matos, Duarte, and Pinto-Gouveia (2014)	Portugal	Neither shame or guilt measured
Frank (1991)	United States of America	Non-clinical sample
Frost et al. (2014)	Germany	Unavailable in English
Grabhorn, Stenner, Kaufbold, Overbeck, and Stangier (2005)	Germany	Unavailable in English

Hayaki, Friedman, and Brownell (2002)	United States of America	General eating and weight disorder sample used*
Mandich and Carbonell (2008)	Argentina	Unavailable in English
Schoettke, Eversmann, and Wiedl (2006)	Germany	Unavailable in English
Troop, Allan, Serpell, and Treasure (2008)	United Kingdom	General eating disorder sample used*
Troop and Connan (2003)	United Kingdom	Book article
Troop, Sottrilli, Serpell, and Treasure (2006)	United Kingdom	General eating disorder sample used*
Waller, Ohanian, Meyer, and Osman (2000)	United Kingdom	Shame and guilt not measured independently
Williamson, Kelley, Davis, Ruggiero, and Blouin (1985)	United States of America	Neither shame or guilt measured

* Percentage of AN/BN participants could not be established

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Appendix B: Momentary Items Utilised: Sample Page from the Experience Sampling

Methodology (ESM) Diary

Where are you?
 Are you with others? Yes / No
 If so, who? Stranger(s) = Acquaintance(s) = Friend(s) = Family = Partner =

How do you feel you compare to others at the moment?
 Inferior -3 -2 -1 0 1 2 3 Superior
 Less competent -3 -2 -1 0 1 2 3 More Competent
 Less talented -3 -2 -1 0 1 2 3 More talented
 Less attractive -3 -2 -1 0 1 2 3 More attractive

Since the last prompt, the most important event that happened to me was:

This was: Very Unpleasant -3 -2 -1 0 1 2 3 Very Pleasant

The following items relate to the personal goals you listed during the initial interview (see front of booklet)

Goal 1:
 How much goal progress do you feel you are making?
 No progress 1 2 3 4 5 6 7 A great deal of progress
 How much effort do you feel you are making to achieve this goal?
 No effort 1 2 3 4 5 6 7 A great deal of effort

Goal 2:
 How much goal progress do you feel you are making?
 No progress 1 2 3 4 5 6 7 A great deal of progress
 How much effort do you feel you are making to achieve this goal?
 No effort 1 2 3 4 5 6 7 A great deal of effort

PLEASE FILL THIS IN (ESSENTIAL): It is now exactly: Hours min

Please describe your mood just before you received the most recent prompt:
 I feel...

	Not at all	Moderately	Very much
▪ Sad	1 2 3 4 5 6 7		
▪ Overactive	1 2 3 4 5 6 7		
▪ Miserable	1 2 3 4 5 6 7		
▪ Happy	1 2 3 4 5 6 7		
▪ Disgusted with self	1 2 3 4 5 6 7		
▪ Tense	1 2 3 4 5 6 7		
▪ Ashamed	1 2 3 4 5 6 7		
▪ Elated	1 2 3 4 5 6 7		
▪ Down	1 2 3 4 5 6 7		
▪ Sped up inside	1 2 3 4 5 6 7		
▪ Blameworthy	1 2 3 4 5 6 7		
▪ Remorse	1 2 3 4 5 6 7		
▪ Anxious	1 2 3 4 5 6 7		
▪ Dissatisfied with myself	1 2 3 4 5 6 7		
▪ Stressed	1 2 3 4 5 6 7		
▪ Like a bad person	1 2 3 4 5 6 7		
▪ Guilty	1 2 3 4 5 6 7		
▪ Restless	1 2 3 4 5 6 7		
▪ Calm	1 2 3 4 5 6 7		
▪ I feel bad about something I have done	1 2 3 4 5 6 7		

	Not at all	Moderately	Very much
Right now, I feel:			
That others dislike me	1 2 3 4 5 6 7		
That others might hurt me	1 2 3 4 5 6 7		
Safe	1 2 3 4 5 6 7		
Suspicious	1 2 3 4 5 6 7		

Since the last prompt:

	Not at all	Moderately	Extremely
I have felt in control of my eating	1 2 3 4 5 6 7		
I have tried to control my eating	1 2 3 4 5 6 7		