

Abstract

This study examined the phenomenology of shame experiences from childhood and adolescence in a sample of women with Binge Eating Disorder. Moreover, a path analysis was investigated testing the association between the extent to which shame-related memories are traumatic and central to identity and binge eating symptoms' severity, mediated by current external shame, body image shame and body image cognitive fusion. Participants in this study were 114 patients, who were assessed through the Eating Disorder Examination and the Shame Experiences Interview, and through self-report measures of external shame, body image shame, body image cognitive fusion and binge eating symptoms. Shame experiences where physical appearance was negatively commented or criticized by others were the most frequently recalled. A path analysis showed a good fit between the hypothesised mediational model and the data. The traumatic and centrality qualities of shame-related memories predicted current external shame, especially body image shame. Current shame feelings were associated with body image cognitive fusion, which, in turn, predicted levels of binge eating symptomatology. Findings support the relevance of addressing early shame-related memories and negative affective and self-evaluative experiences, namely related to body image, in the understanding and management of binge eating.

Keywords: Binge Eating Disorder; Early shame memories; Body Image Shame; Cognitive Fusion; Path Analysis

The impact of early shame memories in Binge Eating Disorder: The mediator effect of current body image shame and cognitive fusion

Cristiana Duarte* & José Pinto-Gouveia

CINEICC – Cognitive and Behavioural Centre for Research and Intervention; Faculty of Psychology and Educational Sciences, University of Coimbra, Portugal

* Corresponding author:

Cristiana Duarte

CINEICC, Faculdade de Psicologia e Ciências da Educação,

Universidade de Coimbra

Rua do Colégio Novo, Apartado 6153

3001-802 Coimbra, Portugal

E-mail: cristianaoduarte@gmail.com (Cristiana Duarte)

Telephone: (+351) 239851450

Fax: (+351) 239851462

1. Introduction

Binge eating has long been considered as a clinically significant problem (Stunkard, 1959), with significant negative psychological and physical health implications (Hudson et al., 2007; Kessler et al., 2013). Nonetheless, it was not until recently that Binge Eating Disorder (BED) was recognized as a distinct eating disorder diagnosis (DSM-5; American Psychiatric Association, 2013). The hallmark feature of BED is the occurrence of binge eating episodes, which involve the ingestion of an unusually large amount of food accompanied by a feeling of loss of control. Binge eating is often precipitated by and acts as a means of coping with negative affect (Dakanalis et al., 2014; Heatherton and Baumeister, 1991; Leehr et al., 2015). These episodes involve emotional distress and shame because of the binging behaviour, as well as concerns about the effects of these episodes on body weight, shape, and self-esteem. However, contrary to the currently established diagnoses of Bulimia Nervosa and Anorexia Nervosa, diagnostic criteria for BED does not require body image concerns for diagnosis (Ahrberg et al., 2011; Dakanalis et al., 2015b; Grilo, 2013).

Theoretical suggestions (Gilbert, 2002; Goss and Gilbert, 2002) and recent studies indicate that shame feelings, especially those related to body image (Duarte et al., 2015c), play an important role in the prospective development of binge eating symptoms (Dakanalis et al., 2014, 2015a) and in the persistence of binge eating symptoms in patients with BED (Dakanalis et al., 2015b; Duarte et al., 2015a; Jambekar et al., 2003). According to the biopsychosocial model of shame (Gilbert, 1998; Gilbert, 2002, 2003; Gilbert, 2007), humans are innately motivated to stimulate positive feelings in others and create a positive image of themselves, to fit within the social group. According to this perspective, shame acts as a warning signal that the individual is negatively evaluated by others, as unattractive, worthless, inferior or defective, because of his/her personal characteristics, attributes or behaviours (e.g., physical appearance or eating behaviour; Gilbert, 1998; Gilbert, 2003).

These negative evaluations may also become the basis for self-evaluation (Gilbert, 1998; Kaufman, 1989). As a consequence, a series of defensive behaviours (e.g., concealment, avoidance) are activated to decrease the probability of such potential social threats (Gilbert, 1998; Gilbert, 2002, 2003; Gilbert, 2007).

Shame is significantly associated with eating psychopathology symptoms in nonclinical (e.g., Gee and Troop, 2003; Murray et al., 2000; Sanftner et al., 1995) and in clinical samples with eating disorders (Duarte et al., 2016; Grabhorn et al., 2006; Swan and Andrews, 2003). More specifically, Duarte et al. (2014), in a study conducted in a nonclinical sample of women from the general population, found that body shame had a significant effect on binge eating symptoms, above overall negative affectivity. Moreover, in a recent study conducted in a clinical sample of women with BED (Duarte et al., 2015a), the effect of shame on the severity of binge eating symptoms was found to be influenced by the extent to which these negative evaluations are associated with cognitive fusion with body image cognitions (Ferreira et al., 2015).

Cognitive fusion is theorized by Acceptance and Commitment Therapy psychopathology model (Hayes et al., 2011) as a process that involves the tendency to relate to internal experiences (e.g., thoughts, memories) as though they were literally true and permanent. When “fused” the individual’s behaviours becomes overly dominated by cognition, rather than by other sources of behavioural regulation and despite of actual negative consequences (Gillanders et al., 2014; Hayes et al., 1999; Luoma & Hayes, 2003). In fact, cognitive fusion triggers experiential avoidance, that is, attempts to avoid, modify, reduce or control such internal experiences. However, these attempts are futile, carrying the unintended consequence of increasing the frequency and intensity of these undesired internal experiences and deteriorating the individual’s mental health (Hayes et al., 1999; Luoma & Hayes, 2003). Specifically, body image cognitive fusion involves the tendency to become

fused with disturbing cognitions about one's body (Ferreira et al., 2015). Research suggest that it is this entangled relationship with shame-related evaluations and body image-related cognitions that may foster maladaptive attempts to avoid these internal events (e.g., through binge eating; Duarte et al., 2015a; Hayes et al., 1999; Luoma and Hayes, 2003).

Shame-related feelings and cognitions may have its roots in early negative shame experiences, such as being criticized by parents, bullied by peers, sexually or physically abused, or displaying negative characteristics of the self to others (Gilbert, 2007; Gilbert et al., 1996; Matos et al., 2013; Tangney and Dearing, 2002). Research shows that these experiences can be recorded in autobiographical memory as central to identity and life story (Pinto-Gouveia and Matos, 2011), influencing subsequent cognitive, emotional and attentional processing (Baumeister et al., 2001; Berntsen and Rubin, 2006; Berntsen and Rubin, 2007; Gilbert et al., 2003; Schore, 1994). Moreover, there is evidence that these early shame experiences can be encoded as traumatic memories (Matos and Pinto-Gouveia, 2010). These shame traumatic and central memories have been associated with current shame feelings and evaluations (Matos et al., 2013), difficulties in emotion regulation (Pinto-Gouveia et al., 2013), experiential avoidance (Dinis et al., 2015), and with a range of psychopathological indicators (Matos and Pinto-Gouveia, 2010; Pinto-Gouveia and Matos, 2011). Moreover, recent studies conducted in a mixed sample of patients with eating disorders showed that shame-related memories have a significant effect on the severity of eating disorder symptoms (Ferreira et al., 2014a) and that this effect is mediated by the extent to which these memories influence current self-evaluations (Matos et al., 2014).

There is evidence that early negative experiences are a risk factor for BED (Caslini et al., 2016; Jackson et al., 2000; Pike et al., 2006;). Fairburn et al. (1998) found that women with BED revealed greater exposure to adverse childhood experiences (e.g., parental criticism, peer bullying, sexual or physical abuse, critical comments about weight, shape or

eating) than women without eating disorders or with other psychiatric disorders. Another study identified sexual abuse as a risk factor for BED (Striegel-Moore et al., 2002). However, the specific impact of shame experiences and their phenomenology in patients with BED and the pathways through which they may operate on the severity of the disorder, were never investigated.

The current study explores early shame experiences in a sample of women diagnosed with BED. Moreover, we sought to test the hypothesis that the extent to which these experiences are recalled as traumatic and central to identity is indirectly associated with the severity of binge eating symptoms, via the effect on current external shame, namely external body shame. External body shame, in turn, is hypothesized to potentially impact binge eating symptoms via the process of body image cognitive fusion.

2. Methods

2.1. Subjects

The sample of this study consisted of 114 women with the diagnosis of BED. Participants were 20-63 years of age, with a mean of 36.62 years ($SD = 37.62$). Their years of education mean was 14.57 ($SD = 5.93$). All participants were Portuguese and Caucasian. The majority were married or cohabiting with a partner (52.6%). Forty patients (35.15%) worked in middle class professions and 25 (21.9%) were students. Participants body mass index (BMI) ranged from 16.59 to 53.07, with a mean of 33.79 ($SD = 7.75$). One (0.88%) participant was low weight ($18.5 < BMI$); 19 (16.66%) had normal weight ($18.5 < BMI < 24.99$), 15 (13.16%) were overweight ($25 < BMI < 29.99$), 28 (24.56%) presented Class I Obesity ($30 < BMI < 34.99$), 22 (19.30%) presented Class II Obesity ($BMI > 35 < 39.99$), and 26 (22.81%) presented class III Obesity ($BMI \geq 40$); BMI was not calculated for three

participants due to instruments unavailability during the respective assessment sessions (World Health Organization, 2011).

2.2. Measures

2.2.1. Body Mass Index (BMI)

The participants' BMI was calculated by dividing the weight (in kg) by height squared (in m), which were collected with standard calibrated instruments.

2.2.2. Eating Disorder Examination 17.0D (EDE 17.0D; Fairburn et al., 2008)

The EDE is a standardized clinical interview that allows a comprehensive assessment of the frequency and severity of the key behavioural and psychological features of eating disorders. This interview was administered in the current study to examine whether the patients met the diagnostic criteria for BED, according to the DSM-5 criteria. Research consistently supports that EDE has high internal consistency, discriminant and concurrent validity and good test-retest reliability (for a review see Fairburn et al., 2008). In the current study, a Cronbach's alpha estimate of 0.83 was obtained for the total score.

2.2.3. Shame Experiences Interview (SEI; Matos and Pinto-Gouveia, 2014)

The SEI is a semi-structured interview that comprehensively assesses the occurrence and characteristics of a shame experience in childhood or adolescence, including its emotional, cognitive, behavioural and contextual aspects. The SEI was developed and examined in nonclinical samples (aged 18-62) and in a mixed clinical sample (aged 17-55; Matos and Pinto-Gouveia, 2014) and was previously applied to patients with eating disorders (aged 14-49; Ferreira et al., 2014a; Matos et al., 2014). To promote a de-shaming and

supportive context, the SEI starts by explaining to the participants the concept of shame, by normalizing experiences of shame as common occurrences in all individuals throughout life, and by providing some examples of shame experiences from childhood and adolescence. The participant is then asked to recall and describe a personal significant shame experience from childhood or adolescence. The characteristics of the recalled shame experience are then assessed throughout the interview.

After recalling and describing the shame experience, participants were asked to fill the self-report measures Centrality of Event Scale (Berntsen and Rubin, 2006) and Impact of Event Scale – Revised (Weiss and Marmar, 1997) in relation to the recalled shame experience.

2.2.4. Centrality of Event Scale (CES; Berntsen and Rubin, 2006)

The CES assesses the extent to which a memory for a distressing life event becomes a reference point for personal identity and for the attribution of meaning to other experiences in the person's life (e.g., 'I feel that this event has become a central part of my life story'). In this study, participants completed the CES in relation to the shame memory they recalled. The CES comprises 20 items, rated on 5-point scale (score range: 1 = *Totally disagree* to 5 = *Totally agree*). In its original study, the CES reported a high internal consistency, with a Cronbach's alpha of 0.94 (Berntsen and Rubin, 2006). In its Portuguese version the scale revealed a Cronbach's alpha of 0.96 (Matos et al., 2010). In the current study the scale revealed a Cronbach's alpha of 0.94.

2.2.5. Impact of Event Scale – Revised (IES-R; Weiss and Marmar, 1997)

The IES-R measures current subjective distress for a specific life event. In the current study the IES-R was used in regard to the shame experience the patient recalled. This scale includes

22 items, rated on a 5-point scale (score range: 0 = *Not at all* to 4 = *Extremely*), which assess traumatic memories' features. IES-R includes the subscales Avoidance (e.g., 'I stayed away from reminders of it'), Intrusion (e.g., 'Any reminder brought back feelings about it') and Hyperarousal (e.g., 'I was jumpy and easily startled'), but a total score can also be calculated. In the original study the total scale revealed high internal consistency (Weiss & Marmar, 1997). The Portuguese version of the IES-R presented a Cronbach's alpha of 0.96 (Matos et al., 2011b). In the current study, we used the total scale, which presented a Cronbach's alpha of 0.95.

2.2.6. Binge Eating Scale (BES; Gormally et al., 1982)

The BES assesses the severity of binge eating symptomatology, including its emotional, cognitive and behavioural dimensions. The BES comprises 16 items and each item includes three to four statements. For each item participants are asked to select the statement that best describes their experience. Each statement represents a rating of severity that ranges from 0 (no difficulties with binge eating) to 3 (severe binge eating symptoms). In the original study the scale revealed a Cronbach's alpha of 0.85 and the Portuguese version it also revealed high internal consistency (0.88; Duarte et al., 2015b). The Cronbach's alpha of the scale in the current study was 0.80.

2.2.7. Body Image Shame Scale (BISS; Duarte et al., 2015c)

The BISS is a 14-item scale that assesses body image shame. The BISS comprises two subscales: external body shame, which measures perceptions that one is negatively evaluated or judged by others because of one's physical appearance (e.g., 'I feel uncomfortable in social situations because I feel that people may criticize me because of my body shape'); and internal body shame, measuring negative self-evaluations due to one's physical appearance

(e.g., 'My physical appearance makes me feel inferior in relation to others'). Participants are invited to rate each item according to the frequency they experience body image shame, using a 5-point scale (score range 0 = *Never* to 4 = *Almost always*). The two subscales were found to have high internal consistency with Cronbach's alpha estimates of 0.90 and 0.89 (Duarte et al., 2014). In the current study the two subscales also presented high internal consistency (External $\alpha = 0.92$ and Internal $\alpha = 0.88$).

2.2.8. Other as Shamer Scale (OAS; Goss et al., 1994)

The OAS is a measure of external shame. The OAS includes 18 items, where participants are asked to rate the frequency to which they make evaluations about how others negatively judge, criticize or belittle them (e.g., 'Other people see me as somehow defective as a person'). Items are rated on a 5-point scale (score range 0 = *Never* to 4 = *Almost always*). In the original study the scale presented a Cronbach's alpha value of 0.92. In the Portuguese version (Matos et al., 2011a) the scale also revealed high internal consistency (with a Cronbach's alpha value of 0.91. In the current study the scale presented a Cronbach's alpha value of 0.94.

2.2.9. Cognitive Fusion Questionnaire-Body Image (CFQ-BI; Ferreira et al., 2015)

The CFQ-BI was based on the original Cognitive Fusion Questionnaire (Gillanders et al., 2014) and comprises 10 items that measure body image cognitive fusion. Participants are asked to rate the extent in which each statement (e.g., 'My thoughts relating to my body image cause me great distress or emotional pain') is true for them, using a 7-point scale (score range: 1 = *Never true* to 7 = *Always true*). The CFQ-BI presented a Cronbach's alpha of .96 in the original validation study (Ferreira et al., 2015) and of 0.97 in the current study.

2.3. Procedure

This study is part of a wider research investigating factors involved in the etiology and maintenance of binge eating. Participants were treatment-seeking adults, recruited at the Hospitalary Centre of the University of Coimbra, Portugal. Approval for the study was obtained from the Hospital Ethics Committee. The diagnostic and assessment procedures were performed by researchers and clinical psychologists, who have considerable experience in the assessment and treatment of eating disorders. The procedure and aims of the study were fully explained to the potential participants, and those wanting to take part in the study provided their written informed consent. Participants in the study were adult women with a current diagnosis of BED, which was assessed through the EDE 17.0D. The exclusion criteria were: i) current comorbid severe mental disorders (e.g., bipolar disorder, severe major depression, schizophrenia, psychotic substance and alcohol abuse) established through a screening clinical interview based on DSM-5 criteria (American Psychiatric Association, 2013) to ensure a clear characterization of the population of interest; ii) current pregnancy or medical or endocrine disorders (e.g., diabetes) that may have implications in food intake; iii) illiteracy or intellectual disability that impaired the adequate completion of self-report measures. Fifteen participants that did not meet eligibility criteria were excluded from the study. Participants who met the required criteria were asked to answer a set of self-report questionnaires and to attend a second assessment session. The second assessment session took place approximately 1 to 3 weeks later, according to the patients' availability. In this session, the patients answered the SEI and the respective self-report measures IES-R and CES.

2.4. Data analysis

Descriptive statistics (i.e., frequencies, means and standard deviations), were used to

examine the characteristics of the shame experiences recalled by the patients. Correlational analyses were conducted to examine the associations between the traumatic features of the shame-related memory and the extent to which it became central to identity, external shame, body image shame, cognitive fusion related to body image, binge eating symptoms, BMI and age. These analyses were conducted using the software SPSS (v.21 SPSS; Armonk, NY: IBM Corp.).

The AMOS software (v.21 SPSS; Armonk, NY: IBM Corp.) was used to analyse the hypothesised mediation model through a path analysis. Path analyses comprise a specific type of structural equation modeling that allows the examination of the direct and indirect associations between multiple exogenous and endogenous variables (Kline, 2005). The path analysis tested in this study examined whether the association between shame-related memories traumatic features and the extent to which they are recalled as central to identity (exogenous variables), and binge eating symptoms (endogenous variable), would be mediated by external shame and external body shame (mediator variables). Also, the model also tested whether the relationship between external shame and external body shame, and binge eating symptoms would be mediated by body image cognitive fusion (mediator variable). The Maximum Likelihood estimation method was used. The model included The following fit indices were utilized to assess model fit: Chi-square (χ^2), which indicates good fit when the value is nonsignificant; the Tucker Lewis Index (TLI) and Comparative Fit Index (CFI), with values greater than .95 indicating very good model fit; the Root-Mean Square Error of Approximation (RMSEA), indicating very good model fit when values are as high as 0.08 and with a $p > 0.05$ indicating that the close-fit hypothesis should not be rejected; and the Standardised Root Mean Square Residual (SRMR), with values as high as 0.08 suggesting acceptable model fit. The hypothesised indirect effects were examined through the bootstrapping method, with 5000 Bootstrap samples originated from the data to compute a

95% bias-corrected confidence intervals (CI). Significant mediation effects were found when zero was not included between the lower and the upper limits of the CI interval (Kline, 2005).

3. Results

3.1. Preliminary analyses

Before conducting the analyses, data were screened for univariate and multivariate normality, outliers and multicollinearity. The Mahalanobis distance analysis indicated that there were no outliers. The analysis of the coefficients of skewness and kurtosis, indicated that there was no severe violation of univariate and multivariate normality. There was no evidence of multicollinearity.

3.2. Shame experiences characteristics

Results regarding the phenomenology of the shame experience recalled indicated that the most frequent type of shame experiences were those where others negatively commented or criticized patients' body weight, shape or physical appearance (including embarrassing physical features; $n = 40$; 35.1%); followed by situations where participants were criticized, made fun, teased or rejected by others ($n = 23$; 20.2%); situations where they felt shame for having negative personal attributes, characteristics or devaluing behaviours exposed to others ($n = 17$; 14.9%); sexual abuse ($n = 10$; 8.8%); and emotional abuse ($n = 9$; 7.9%). Less frequent experiences were: feeling ashamed because of the behaviour of a family member or because of one's family status ($n = 6$; 5.3%); criticism or teasing by parents/caregivers ($n = 5$; 4.4%); and finally physical abuse (e.g., aggression by peers; $n = 4$; 3.5%). The majority of the participants reported that the experience occurred in a group/public context ($n = 90$; 78.9%).

Regarding the question of who shamed them, most participants recalled that they were

shamed by their peers (i.e., friends and colleagues; $n = 42$; 36.8%); 19 (16.7%) identified themselves as the shamer (i.e., for having a negative devaluing attributes, characteristic or behaviours exposed to others); 18 identified the parents (15.7%) and 15 (13.2%) other family members (e.g., siblings) as their shamer; 6 (5.3%) were shamed by their teacher at the time and 14 (12.3%) by a stranger or by other nonspecific people. The shamer was usually someone they knew and/or liked ($n = 42$; 36.9%); someone older ($n = 50$; 43.9%) or about the same age ($n = 38$; 33.3%); equal in social rank ($n = 49$; 43.0%) or an authority figure ($n = 49$; 43.0%); 41 (36.0%) mentioned that the shamer was a male and 37 (32.5%) said that was female. The majority of participants indicated that during the experience they felt people were seeing them as inferior or worthless ($n = 67$; 58.8%), and also evaluated themselves as such ($n = 69$; 60.5%).

3.3. Correlations

Descriptive (means and standard deviations) statistics of the study variables are reported in Table 1. Results indicated that the centrality of the shame memory was positively associated with binge eating symptoms; positive smaller associations were also found in regard to external shame, body image-focused external shame, and body image-related cognitive fusion. The traumatic features of the shame-related memory was positively associated with binge eating symptoms, the external and internal dimensions of body image shame, and external shame. Strong to moderate positive associations were found between binge eating symptoms and body image cognitive fusion, external shame, and external and internal body shame. Stronger associations were found between the study variables and the external body shame and this variable was selected to be included in the path analysis. BMI was significantly associated with increased traumatic shame memory, external and internal body shame and body image cognitive fusion. Age presented small positive associations with

body image shame and with BMI and was not significantly associated with the remaining variables.

3.4. Path analysis

The model (Figure 1) revealed a good model fit: $\chi^2_{(7)} = 10.68$, $p = 0.153$; CFI = 0.98; RMSEA = 0.07 ($p = 0.305$); SRMR = 0.08. Results indicated that the following direct effects were nonsignificant: the centrality and traumatic features of the shame-related memory on binge eating symptoms ($b_{CES} = 0.05$, $SEb = 0.04$, $Z = 1.01$, $p = 0.313$; $b_{IES} = 0.12$, $SEb = .30$, $Z = 0.41$, $p = 0.681$), and on body image cognitive fusion ($b_{CES} = 0.01$, $SEb = 0.01$, $Z = 0.62$, $p = 0.536$; $b_{IES} = 0.05$, $SEb = 0.06$, $Z = 0.95$, $p = 0.344$); the centrality of the shame-related memory on external body image shame ($b_{CES} = -0.00$, $SEb = 0.01$, $Z = -0.46$, $p = 0.643$); the traumatic features of the shame-related memory on external shame ($b_{IES} = 0.31$, $SEb = 0.72$, $Z = 0.43$, $p = 0.667$); external shame on binge eating symptoms ($b_{OAS} = 0.06$, $SEb = 0.04$, $Z = 1.44$, $p = 0.149$).

The traumatic features of the shame-related memory presented a direct effect on external body shame ($b_{IES} = 0.11$, $SEb = 0.03$, $Z = 3.38$, $p < 0.001$), whereas the centrality of the shame-related memory presented a direct effect on external shame ($b_{CES} = 0.23$, $SEb = 0.08$, $Z = 3.03$, $p = 0.002$). External body shame and external shame, in turn, presented a significant direct effect on body image cognitive fusion ($b_{BISS} = 0.68$, $SEb = 0.11$, $Z = 6.17$, $p < 0.001$; $b_{OAS} = 0.02$, $SEb = 0.01$, $Z = 2.29$, $p = 0.022$). External body shame had a significant direct effect on binge eating symptoms ($b_{BISS} = 1.35$; $SEb = 0.67$, $Z = 2.04$, $p = 0.042$). Body image cognitive fusion had a direct effect on binge eating symptoms ($b_{CFQ-BI} = 2.19$; $SEb = 0.49$, $Z = 4.47$, $p < 0.001$). The analysis of the indirect effects indicated that the traumatic and centrality features of the shame-related memory had a significant indirect effect on body image cognitive fusion (0.15 and 0.05 for IES and CES, respectively), fully mediated by

external body shame and external shame ($CI_{IES} = 0.04$ to 0.29 , and $CI_{CES} = 0.01$ to 0.13 , respectively). Moreover, body image cognitive fusion fully mediated the effect of external body shame (0.26) and external shame (0.10) on binge eating symptoms ($CI_{BISS} = 0.13$ to 0.33 ; and $CI_{OAS} = 0.01$ to 0.18 , respectively). The exogenous variables – traumatic and centrality features of the shame-related memory – also had a significant indirect effect on binge eating symptoms ($CI_{IES} = 0.03$ to 0.24 ; and $CI_{CES} = 0.01$ to 0.07 , respectively).

Finally, an alternative model examined the effect of binge eating on the traumatic and centrality features of the shame-related memory, mediated by body image cognitive fusion, external shame and external body shame. Results indicated that the model did not fit the data well ($\chi^2_{(7)} = 24.11$, $p = 0.002$; CFI = 0.91 ; RMSEA = 0.14 ($p = 0.013$); SRMR = 0.17).

4. Discussion

The present research conducted in a clinical sample of women with BED obtained support for a theoretical model that suggests that early shame experiences are associated with more severe binge eating symptomatology, due to their effect on heightened current shame, particularly body image shame and the tendency to become overly fused with and distressed by body image-related cognitions.

The most recalled shame experiences were experiences related to negative comments or criticism about body weight, shape and physical appearance, which is consistent with prior evidence that early weight and body image teasing experiences are an important factor involved in the etiology of BED (Fairburn et al., 1998; Jackson et al., 2000; Pike et al., 2006). Shame experiences of being bullied, criticized, rejected, of having negative features exposed to others, and experiences of sexual and emotional abuse were also recalled as significant shame experiences that these patients went through as a child or adolescent, which is also in line with previous theoretical and empirical accounts on negative experiences as risk factors

for binge eating symptoms later in life (Caslini et al., 2016; Striegel-Moore et al., 2002). We also found that peers were recalled as common sources of shame. This result is consistent with research conducted in other patients with eating disorders (Ferreira et al., 2014a; Matos et al., 2014), which found that shame events that involved peers played a significant role on the severity of disorder.

The correlation analyses supported that the traumatic and centrality qualities of the recalled shame experience were associated with current external shame, body shame, and body image cognitive fusion.

The hypothesized model tested through a path analysis suggested that shame-related memories' features have an indirect effect on binge eating symptoms, mediated by external general shame, external body shame and body image cognitive fusion. Our analyses demonstrated that the model was a good fit to the data and the bootstrapping method confirmed the significance of the hypothesised mediation effects. The model examined in the current study seems to contribute to the understanding of the processes involved in the vulnerability and persistence of the symptoms of patients with BED. In fact, the mediational paths uncovered in the current study suggest that the effect that negative interpersonal events experienced in key developmental stages may have on disordered eating behaviours depends on the extent to which these events become a reference for self-evaluation and contribute to a sense of inferiority, unattractiveness or unworthiness within the social group. Noteworthy, results of the current study support that, in women with BED, shame experiences related to physical appearance seem to play a key role in these associations. Moreover, results demonstrated that body image cognitive fusion has a significant mediating effect on these relationships, which suggests that it is the process of *how* victims of shaming experiences relate to these memories and to their current shame that may influence their binge eating symptoms. In fact, the tendency to become fused and overly involved and distressed with evaluations

and judgements about body image is conceptualized as being at the root of experiential avoidance (Ferreira et al., 2014b; Ferreira et al., 2015; Gillanders et al., 2014; Hayes et al., 1999; Hayes et al., 2006). Thus, it is plausible that binge eating symptoms emerge as a maladaptive strategy to attempt to temporarily avoid, escape or diminish the frequency or intensity of such negative memories, feelings and evaluations of feeling inferior, ostracized or rejected by others. However, these symptoms may ultimately amplify shame and generate more distress, suffering, and negative physical consequences (Hudson et al., 2007; Kessler et al., 2013; Wonderlich et al., 2009).

The current findings are based on a cross sectional design, rendering impossible to draw conclusions regarding the temporal relations between the variables. Nonetheless, they provide a useful framework for understanding the factors operating in the vulnerability and persistence of binge eating symptoms in a clinical sample with BED and the function that binge eating may serve for these patients. These findings support the growing evidence that the dimension of body image and its significance for self-evaluation is relevant in BED, bringing this disorder closer to the other established eating disorders (Ahrberg et al., 2011; Dakanalis et al., 2015b; Duarte et al., 2016; Grilo, 2013). Clinically our findings suggest that it is important to assess and address early shame experiences, namely those related to the physical appearance dimension, and to help patients to understand their negative self-evaluations and disordered eating behaviours as strategies they came to adopt as a means to protect them from interpersonal and emotional threats (Goss and Allan, 2009, 2010; Goss and Gilbert, 2002)). Current treatment approaches, including compassion and acceptance-based interventions, may be particularly useful for these cases. These interventions focus on the defusion from the meaning of these memories for self-identity and life's story, and on the promotion of the willingness to turn towards and accept negative internal experiences (including memories, emotions, thoughts, physical sensations), rather than avoiding them,

and on building more effective and flexible behaviours (Forman et al., 2013; Gilbert, 2005; Goss and Allan, 2010; Hill et al., 2014; Tirsch et al., 2014).

The use of retrospective data to assess early shame experiences and the cross-sectional design are important limitations of this study, which limit the ability to draw definitive conclusions regarding causality. The reluctance from participants to disclose personal sensitive experiences is also a potential limitation of the study. However, retrospective data was obtained through the administration of a structured clinical interview that follows a de-shaming and supportive approach to reassure participants and promote their engagement. Also, the SEI encourages the recollection of a specific personal shame-related experience and its contextual details and characteristics, which may improve the accuracy and the reliability of the data collected (Brewin et al., 1993). Moreover, we found that an alternative model to our initial hypothesised model did not fit the data well. Nonetheless, future longitudinal research is necessary to expand this study and to corroborate the hypothesis that early shame experiences influence binge eating symptomatology over time through its effect on negative affective and self-evaluative experiences and maladaptive self-regulatory processes. Another limitation of the study was the relatively small sample size. Rigorous sample collection procedures were followed to assure the identification of the population of interest, data was analysed in complete cases, and there were no deviations from multivariate normality (Kline, 2005). Nonetheless, future studies should test the proposed model in larger samples to ascertain its replicability.

The current study was the first to examine the phenomenology of shame experiences occurred in childhood and adolescence in patients with BED. The data suggests that the tested model is a potentially useful lens through which to understand BED development and maintenance, and provides important directions for the clinical management of binge eating.

Grant: This research has been supported by the first author (Cristiana Duarte) Ph.D. Grant (SFRH/BD/76858/2011), sponsored by FCT (Portuguese Foundation for Science and Technology).

Acknowledgements

Appreciation is expressed to Professor Cláudia Ferreira and Dr. Margarida Robalo for assistance in recruitment of participants.

References

- Ahrberg, M., Trojca, D., Nasrawi, N., Vocks, S., 2011. Body image disturbance in binge eating disorder: A review. *European Eating Disorders Review* 19 (5), 375-381.
- American Psychiatric Association, 2013. *Diagnostic and statistical manual of mental disorders : DSM-5*. American Psychiatric Publishing., Arlington, VA.
- Baumeister, R.F., Bratslavsky, E., Finkenauer, C., Vohs, K.D., 2001. Bad is stronger than good. *Review of General Psychology* 5 (4), 323-370.
- Berntsen, D., Rubin, D., 2006. Centrality of Event Scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. *Behaviour Research and Therapy* 44, 219-231.
- Berntsen, D., Rubin, D., 2007. When a trauma becomes a key to identity: Enhanced integration of trauma memories predicts posttraumatic stress disorder symptoms. *Applied Cognitive Psychology* 21, 417-431.
- Brewin, C. R., Andrews, B., & Gotlib, I. H. (1993). Psychopathology and early experience: a reappraisal of retrospective reports. *Psychological bulletin*, 113(1), 82.

Caslini, M., Bartoli, F., Crocamo, C., Dakanalis, A., Clerici, M., & Carrà, G., 2016. Disentangling the association between child abuse and eating disorders: a systematic review and meta-analysis. *Psychosomatic medicine*, 78(1), 79-90.

Dakanalis, A., Carrà, G., Calogero, R., Fida, R., Clerici, M., Zanetti, M. A., & Riva, G., 2015a. The developmental effects of media-ideal internalization and self-objectification processes on adolescents' negative body-feelings, dietary restraint, and binge eating. *European Child & Adolescent Psychiatry* 24(8), 997-1010.

Dakanalis, A., Carrà, G., Timko, A., Volpato, C., Pla-Sanjuanelo, J., Zanetti, A., Clerici, M., Riva, G., 2015b. Mechanisms of influence of body checking on binge eating. *International Journal of Clinical and Health Psychology* 15 (2), 93-104.

Dakanalis, A., Timko, C. A., Carrà, G., Clerici, M., Zanetti, M. A., Riva, G., & Caccialanza, R. (2014). Testing the original and the extended dual-pathway model of lack of control over eating in adolescent girls. A two-year longitudinal study. *Appetite*, 82, 180-193.
doi:10.1016/j.appet.2014.07.022

Dinis, A., Carvalho, S., Pinto-Gouveia, J., Estanqueiro, C., 2015. Shame memories and depression symptoms: The role of cognitive fusion and experiential avoidance. *International Journal of Psychology and Psychological Therapy* 15 (1), 63-86.

Duarte, C., Ferreira, C., Pinto-Gouveia, J., 2016. At the core of eating disorders: Overvaluation, social rank, self-criticism and shame in anorexia, bulimia and binge eating disorder. *Comprehensive Psychiatry* 66, 123-131.

Duarte, C., Pinto-Gouveia, J., Ferreira, C., 2014. Escaping from body image shame and harsh self-criticism: Exploration of underlying mechanisms of binge eating. *Eating Behaviors* 15 (4), 638-643.

Duarte, C., Pinto-Gouveia, J., Ferreira, C., 2015a. Ashamed and fused with body image and eating: Binge eating as an avoidance strategy. *Clinical Psychology & Psychotherapy*.

Duarte, C., Pinto-Gouveia, J., Ferreira, C., 2015b. Expanding binge eating assessment: Validity and screening value of the Binge Eating Scale in women from the general population. *Eating Behaviors* 18 41–47.

Duarte, C., Pinto-Gouveia, J., Ferreira, C., Batista, D., 2015c. Body image as a source of shame: A new measure for the assessment of the multifaceted nature of body image shame. *Clinical Psychology & Psychotherapy* 22 (6), 656-666.

Fairburn, C., Cooper, Z., O'Connor, M., 2008. Eating Disorder Examination (Edition 16.0D), in: Fairburn, C. (Ed.), in: Fairburn, C. (Ed.), *Cognitive Behavior Therapy and Eating Disorders*. Guilford Press, New York, pp. 265–308.

Fairburn, C.G., Doll, H.A., Welch, S.L., Hay, P.J., Davies, B.A., O'Connor, M.E., 1998. Risk factors for binge eating disorder: A community-based, case-control study. *Archives of General Psychiatry* 55 (5), 425-432.

Ferreira, C., Matos, M., Duarte, C., Pinto-Gouveia, J., 2014a. Shame memories and eating psychopathology: The buffering effect of self-compassion. *European Eating Disorders Review* 22 (6), 487-494.

Ferreira, C., Palmeira, L., Trindade, I., 2014b. Turning eating psychopathology risk factors into action. The pervasive effect of body image-related cognitive fusion. *Appetite* 80, 137-142.

Ferreira, C., Trindade, I.A., Duarte, C., Pinto-Gouveia, J., 2015. Getting entangled with body image. Development and validation of a new measure. *Psychology and Psychotherapy: Theory research and practice* 88 (3), 304-316.

Fitzsimmons-Craft, E.E., Bardone-Cone, A.M., Kelly, K.A., 2011. Objectified body consciousness in relation to recovery from an eating disorder. *Eating Behaviors* 12 (4), 302-308.

Forman, E., Hoffman, K., Juarascio, A., Butryn, M., Herbert, J., 2013. Comparison of acceptance-based and standard cognitive-based coping strategies for craving sweets in overweight and obese women. *Eating Behaviors* 14 (1), 64-68.

Gee, A., Troop, N.A., 2003. Shame, depressive symptoms and eating, weight and shape concerns in a non-clinical sample. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity* 8 (1), 72-75.

Gilbert, P., 1998. What is shame? Some core issues and controversies, in: Gilbert, P., Andrews, B. (Eds.), *Shame: Interpersonal behaviour, Psychopathology and Culture*. Oxford University Press, New York, pp. 3-36.

Gilbert, P., 2002. Body shame: A biopsychosocial conceptualisation and overview with treatment implications, in: Gilbert, P., Miles, J. (Eds.), *Body shame: Conceptualisation, Research and Treatment*. Brunner Routledge, New York, pp. 3-54.

Gilbert, P., 2003. Evolution, social roles and the differences in shame and guilt. *Social Research: An International Quarterly* 70, 1205-1230.

Gilbert, P., 2005. *Compassion: Conceptualisations, Research and Use in Psychotherapy*. Routledge, New York.

Gilbert, P., 2007. The evolution of shame as a marker for relationship security, in: Tracy, J., Robins, R., Tangney, J. (Eds.), *The Self-Conscious Emotions: Theory and Research*. Guilford, New York, pp. 283–309.

Gilbert, P., Allan, S., Goss, K., 1996. Parental representations, shame, interpersonal problems, and vulnerability to psychopathology. *Clinical Psychology and Psychotherapy* 3, 23-34.

Gilbert, P., Cheung, M.S.P., Grandfield, T., Campey, F., Irons, C., 2003. Recall of threat and submissiveness in childhood: Development of a new scale and its relationship with

depression, social comparison and shame. *Clinical Psychology and Psychotherapy* 10, 108-115.

Gillanders, D., Bolderston, H., Bond, F.W., Dempster, M., Flaxman, P., Campbell, L., Kerr, S., Tansey, L., Noel, P., Ferenbach, C., Masley, S., Roach, L., LLoyd, J., May, L., Clarke, S., Remington, B., 2014. The development and initial validation of the cognitive fusion questionnaire. *Behavior Therapy* 45 (1), 83-101.

Gormally, J., Black, S., Daston, S., Rardin, D., 1982. The assessment of binge eating severity among obese persons. *Addictive Behaviors* 7 (1), 47-55.

Goss, K., Allan, S., 2009. Shame, pride and eating disorders. *Clinical Psychology & Psychotherapy* 16, 303-316.

Goss, K., Allan, S., 2010. Compassion Focused Therapy for eating disorders. *International Journal of Cognitive Therapy* 3 (2), 141-158.

Goss, K., Gilbert, P., 2002. Eating disorders, shame and pride: A cognitive-behavioural functional analysis, in: Gilbert, P., Miles, J. (Eds.), *Body shame: Conceptualisation, Research and Treatment*. Brunner Routledge, New York, pp. 219–255.

Goss, K., Gilbert, P., Allan, S., 1994. An exploration of shame measures: I: The ‘other as shamer’ scale. *Personality and Individual Differences* 17, 713-717.

Grabhorn, R., Stenner, H., Stangier, U., Kaufhold, J., 2006. Social anxiety in anorexia and bulimia nervosa: The mediating role of shame. *Clinical Psychology & Psychotherapy* 13 (1), 12-19.

Grilo, C. M., 2013. Why no cognitive body image feature such as overvaluation of shape/weight in the binge eating disorder diagnosis? *International Journal of Eating Disorders*, 46(3), 208-211. doi:10.1002/eat.22082

Hayes, S., Strosahl, K.D., Wilson, K., 1999. *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change*. Guilford Press, New York.

Hayes, S.C., Luoma, J.B., Bond, F.W., Masuda, A., Lillis, J., 2006. Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy* 44 (1), 1-25.

Hill, M., Masuda, A., Melcher, H., Morgan, J., Twohig, M., 2014. Acceptance and commitment therapy for women diagnosed with binge eating disorder: A case-series study. *Cognitive and Behavioral Practice*.

Hudson, J.I., Hiripi, E., Pope, H.G., Jr., Kessler, R.C., 2007. The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry* 61 (3), 348-358.

Jackson, T.D., Grilo, C.M., Masheb, R.M., 2000. Teasing history, onset of obesity, current eating disorder psychopathology, body dissatisfaction, and psychological functioning in binge eating disorder. *Obesity Research* 8 (6), 451-458.

Jambekar, S., Masheb, R., Grilo, C., 2003. Gender differences in shame in patients with Binge Eating Disorder. *Obesity* 11 (4), 571-577.

Kaufman, G., 1989. *The Psychology of Shame*. Springer, New York.

Kessler, R., Berglund, P., Chiu, W.-., Deitz, A., Hudson, J., Shahly, V., Aguilar-Gaxiola, S., Alonso, J., Angermeyer, M., Benjet, C., Bruffaerts, R., de Girolamo, G., de Graaf, R., Maria Haro, J., Kovess-Masfety, V., O'Neill, S., Posada-Villa, J., Sasu, C., Scott, K., Viana, M., Xavier, M., 2013. The prevalence and correlates of Binge Eating Disorder in the World Health Organization World Mental Health Surveys. *Biological Psychiatry* 73 (9), 904-914.

Kline, R.B., 2005. *Principles and Practice of Structural Equation Modeling*, 2nd ed. The Guilford Press, New York.

Leehr, E., Krohmer, K., Schag, K., Dresler, T., Zipfel, S., & Giel, K., 2015. Emotion regulation model in binge eating disorder and obesity - A systematic review. *Neuroscience and Behavioral Reviews*, 49, 125-134.

Luoma, J., Hayes, S.C., 2003. Cognitive defusion, in: O'Donohue, W.T., Fisher, J.E., Hayes, S.C. (Eds.), *Cognitive Behavior Therapy: Applying Empirically Supported Techniques in Your Practice*. Wiley, New York, pp. 71-78.

Matos, M., Ferreira, C., Duarte, C., Pinto-Gouveia, J., 2014. Eating disorders: When social rank perceptions are shaped by early shame experiences. *Psychology and Psychotherapy: Theory research and practice*.

Matos, M., Pinto-Gouveia, J., 2010. Shame as a traumatic memory. *Clinical Psychology and Psychotherapy* 17, 299-312.

Matos, M., Pinto-Gouveia, J., 2014. Understanding shame memories' phenomenology in clinical and nonclinical samples I. The Shame Experiences Interview. Submitted manuscript.

Matos, M., Pinto-Gouveia, J., Duarte, C., 2011a. Other as shamer: Versão Portuguesa e propriedades psicométricas de uma medida de vergonha externa [Other as shamer: Portuguese version and psychometric properties of a measure of external shame]. Manuscript submitted for publication.

Matos, M., Pinto-Gouveia, J., Duarte, C., 2013. Internalizing early memories of shame and lack of safeness and warmth: The mediating role of shame on depression. *Behavioural and Cognitive Psychotherapy* 41 (4), 479-493.

Matos, M., Pinto-Gouveia, J., Gomes, P., 2010. Centralidade das experiências de vergonha: Estudo das propriedades psicométricas da versão portuguesa da Escala da Centralidade do Acontecimento [Centrality of shame experiences: Study of the psychometric properties of the Portuguese version of the Centrality of Event Scale]. *Psicologia XXIV*, 73-95.

Matos, M., Pinto-Gouveia, J., Martins, S., 2011b. O impacto traumático de experiências de vergonha: Estudo das propriedades psicométricas da versão portuguesa da Impact of Event Scale-Revised [The traumatic impact of shame experiences: Study of the psychometric

properties of the Portuguese version of the Impact of Event Scale-Revised]. *Psychologica* 54, 413–438.

Murray, C., Waller, G., Legg, C., 2000. Family dysfunction and bulimic psychopathology: The mediating role of shame. *International Journal of Eating Disorders* 28 (1), 84-89.

Pike, K.M., Wilfley, D., Hilbert, A., Fairburn, C.G., Dohm, F.-A., Striegel-Moore, R.H., 2006. Antecedent life events of binge-eating disorder. *Psychiatry Research* 142 (1), 19-29.

Pinto-Gouveia, J., Castilho, P., Matos, M., Xavier, A., 2013. Centrality of shame memories and psychopathology: the mediator effect of self-criticism. *Clinical Psychology: Science and Practice* 20 (3), 323-334.

Pinto-Gouveia, J., Matos, M., 2011. Can shame memories become a key to identity? The centrality of shame memories predicts psychopathology. *Applied Cognitive Psychology* 25, 281-290.

Sanftner, J.L., Barlow, D.H., Marschall, D.E., Tangney, J.P., 1995. The relation of shame and guilt to eating disorder symptomatology. *Journal of Social and Clinical Psychology* 14 (4), 315-324.

Schore, A.N., 1994. *Affect Regulation and the Origin of the Self: The Neurobiology of Emotional Development*. Erlbaum, Mahwah, NJ.

Striegel-Moore, R., Dohm, F., Pike, C., Wilfley, D., Fairburn, C., 2002. Abuse, bullying, and discrimination as risk factors for binge eating disorder. *American Journal of Psychiatry* 159, 1902-1907.

Stunkard, A.J., 1959. Eating patterns and obesity. *Psychiatric Quarterly* 33, 284-295.

Swan, S., Andrews, B., 2003. The relationship between shame, eating disorders and disclosure in treatment. *British Journal of Clinical Psychology* 42 (4), 367-378.

Tangney, J., Dearing, R., 2002. *Shame and Guilt*. Guilford, New York.

Tirch, D., Schoendorff, B., Silberstein, L., Gilbert, P., Hayes, S., 2014. The ACT Practitioner's Guide to the Science of Compassion: Tools for Fostering Psychological Flexibility. New Harbinger Publications, Oakland, CA.

Weiss, D.S., Marmar, C.R., 1997. The Impact of Event Scale – Revised, in: Wilson, J.P., Keane, T.M. (Eds.), Assessing Psychological Trauma and PTSD. Guilford Press, New York, pp. 399–411.

Wonderlich, S.A., Gordon, K.H., Mitchell, J.E., Crosby, R.D., Engel, S.G., 2009. The validity and clinical utility of binge eating disorder. *International Journal of Eating Disorders* 42 (8), 687-705.

World Health Organization, 2011. World health statistics. Retrieved from:

http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf.

Table 1.

Means (M), Standard Deviations (SD), , skewness (Sk), kurtosis (Ku), and correlations between the study variables

	IES-R	CES	OAS	BISS External	BISS Internal	CFQ-BI	BES
CES	0.72***	1					
OAS	0.21*	0.26**	1				
BISS External	0.30**	0.19*	0.33**	1			
BISS Internal	0.31**	0.17	0.22*	0.78***	1		
CFQ-BI	0.33***	0.27**	0.35***	0.56***	0.55***	1	
BES	0.32**	0.30**	0.33***	0.43***	0.34***	0.53***	
BMI	0.22*	0.11	0.14	0.35***	0.26**	0.21*	0.17
Age	0.13	0.05	-0.02	0.24***	0.25**	-0.12	0.09
<i>M (SD)</i>	6.64 (2.83)	67.65 (18.54)	37.38 (15.60)	2.60 (1.06)	3.21 (0.80)	5.03 (1.43)	29.14 (7.42)
<i>Sk</i>	-0.34	-0.33	-0.03	-0.75	-1.33	-0.58	-0.20
<i>ku</i>	-0.51	-0.61	-0.60	-0.31	1.50	-0.42	-0.44

Note:

*** $p < 0.001$; ** $p < 0.010$; * $p < 0.050$

IES-R - Impact of Event Scale Revised; CES - Centrality of Event Scale; OAS - Other as Shamer Scale; BISS - Body Image Shame Scale; CFQ-BI - Cognitive Fusion Questionnaire-Body Image; BES - Binge Eating Scale

Figure 1. Path analysis with standardized regression weights and squared multiple correlations. Note: *** $p < 0.001$, ** $p < 0.010$; * $p < 0.050$

