



# The link between external and internal shame and binge eating: the mediating role of body image-related shame and cognitive fusion

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## Abstract

**Purpose** Despite the growing interest in binge eating, research on this public health problem in male samples is limited. Indeed, the examination of underlying emotional mechanisms and potential gender differences in binge eating are still needed. This study explored differences between men and women in binge eating severity and related emotional mechanisms. Also, this study explored the impact of external and internal shame on binge eating severity, when mediated by body image-related shame and cognitive fusion, in men and women.

**Methods** The sample consists of 787 participants from the general population (144 men and 643 women), aged from 18 to 40 years.

**Results** Women presented higher levels of binge eating symptomatology and also of body image-related difficulties, than men. Path analysis results showed that external and internal shame had a significant impact on binge eating severity, and that these relationships were mediated by body image-related shame and cognitive fusion. Multi-group analysis revealed the invariance of this model in both sexes.

**Conclusion** Although men and women revealed significant differences in the severity of binge eating and related emotional mechanisms, underlying mechanisms in binge eating seem to be invariant for gender. Indeed, this study suggested that both external and internal shame experiences play an important role in binge eating symptomatology, when associated with body image-related shame and cognitive fusion, both in men and women. These findings seem to support that binge eating may emerge as a maladaptive attempt to cope with shame experiences in both sexes.

**Level of evidence** Level III: case control analytic study.

**Keywords** External shame · Internal shame · Binge eating · Body image-related shame · Body image-related cognitive fusion · Gender

## Introduction

Binge eating is a public health problem in modern Western societies shared almost equally by both genders [1, 2]. Binge eating has been associated with decreased physical and psychological health, in part due to its high comorbidity with overweight and obesity, other physical health conditions (e.g. type 2 diabetes, cardiovascular diseases), as well

as with several mental health conditions (e.g. depression; [3–5]).

Binge eating is characterized by the intake of an excessive amount of food in a short period of time, along with a sense of loss of control in relation to the quantity and quality of the food [6]. These episodes are experienced with a significant distress, shame and guilt [6, 7]. Binge eating behaviours can be present in different eating disorders (e.g. anorexia, bulimia, and binge eating Disorder) and, sometimes, are its nuclear feature [6]. However, several studies have shown that these episodes are also common in the general population in a continuum of severity [1, 8, 9]. Specifically, there is evidence supporting that behavioural, cognitive and emotional binge eating symptomatology occurs in 10–20% of the general population, in both men and women [10, 11].

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Despite the growing interest on binge eating, the research of this problem in men is extremely limited in comparison to those conducted with women. Furthermore, the examination of the emotional mechanisms underlying these behaviours and the differences between genders are still needed.

Binge eating episodes can be conceptualized as a strategy of distraction or avoidance [12], as a way to reduce negative emotional states (such as shame, sadness, guilt) or a way to pursue pleasurable sensations [13]. However, the consequence of these episodes of food overconsumption is an increase of negative affectivity [14]. In fact, it has been assumed that binge eating is often triggered by experiencing stressor experiences or negative affect [7, 15, 16]. Particularly, these episodes of binge eating have been related to difficulties in the emotion regulation in the face of adverse events, that is, difficulties in identifying and dealing with these emotions in an adaptive and effective way [17, 18].

Emotions are a fundamental part of the human experience but they are also the root of human suffering. It is possible to recognize shame as a paradigmatic case of the emotion-related complexity [19, 20]. According to the biopsychosocial model [21, 22], shame arises as an involuntary response in the face of threat of loss of social attractiveness (i.e. as a strategy to keep the self safe from criticism, rejection, exclusion, or attack from others). Thus, when the individual perceives that he/she has (or is seen by others as having) a lack of attributes or qualities that are valued, shame is activated. Indeed, this emotion can be conceptualized as a defensive response (through the activation of emotions such as distress or anger, and also behaviours of correction, submission, or concealment), ensuring the acceptance by the group and development of the individual [21, 22].

Gilbert [22] distinguishes two dimensions of shame, which encompasses different monitoring and processing systems, namely external and internal shame. External shame refers to the perception of existing negatively in the mind of the other (i.e. that others evaluate the self as having flaws or inadequacies [21]). This experience of external shame tends to trigger behaviours of hiding, flight, or correction of undesirable features, in an attempt to positively influence others' evaluation about the self (e.g. [21, 23]). Internal shame has an inwardly focus and is related to self-criticism and judging, and can be understood as the internalization of external shame [21, 22]. Thus, internal shame is characterized by global devaluations of the self and feelings of inadequacy, inferiority, undesirability, emptiness and isolation. In spite of this distinction, these two shame dimensions are closely associated and involve similar characteristics and purposes [21, 22].

External and internal shame both play a crucial role in our social functioning, but are also widely associated with psychopathological suffering and symptomatology [24, 25]. Different studies support the central role of shame in

disordered eating, both in clinical [18, 25–27] and non-clinical samples [5, 28]. While the crucial role of shame in the development and maintenance of weight and body image concerns and disordered eating is unanimously accepted [27, 29], few studies have focused on the clarification of the differential impact of external and internal shame.

These experiences of shame can be associated with body image when there is the perception that one's own body image (e.g. body shape, size or weight) may be a source of criticism from others, leading to devaluation or rejection of the self [5, 21, 25, 28, 30]. Body image emerges as a central dimension in the experience of shame given the importance attributed to physical appearance in modern Western societies, in particular due to the globalization of social messages that associate certain desirable psychological characteristics (such as power, success, and happiness) with physical appearance [31]. In response to experience of body image shame, individuals may adopt defensive behaviours, such as hiding the body or avoiding social situations which expose one's physical appearance [28]. Body image-related shame has been associated with different poor psychological adjustment indicators [28, 32] and eating psychopathology [25], particularly with binge eating [5, 18, 33]. A recent study revealed that women who experience higher levels of body-image shame (i.e. feelings of inferiority, inadequacy and unattractiveness based on body image) tend to engage in disordered eating attitudes and behaviours.

Although the relationship between shame and eating psychopathology is consistently supported by literature, there is also evidence that experiential avoidance [12] and other emotion regulation processes may mediate this relationship.

Cognitive fusion has been identified as a maladaptive emotion regulation process that plays a relevant role in the explanation of body and eating psychopathology [28, 35–37]. Cognitive fusion is a process where internal and transient events (such as thoughts, sensations and emotions) are perceived as true translations of reality, leading to behaviour being regulated more by language than by its direct consequences. This process can occur in relation to a specific domain, for example, in relation to body image, which is defined by one's tendency to get entangled with body image-related inner events, assuming them as unquestionable rules, instead of experiencing them as subjective and transitory [36]. Body image-related cognitive fusion is associated with more severe levels of disordered eating [35]. Recently, Duarte and Pinto-Gouveia [38], in a study with women diagnosed with binge eating disorder, suggested that body image-related cognitive fusion is an important mediator between experiences of shame (i.e. memories and experiences of shame) and binge eating symptomatology.

The present study aimed to investigate whether body image-related shame and cognitive fusion mediate the relationship between the experience of external and internal

shame and binge eating severity, in both genders. Thus, we hypothesize that higher levels of shame (external and internal shame), when associated with high levels of body-image related shame and cognitive fusion, explain higher binge eating severity, both in men and women. At the same time, we hypothesize that the reverse model is also plausible, that is, that binge eating behaviours fuel potential higher levels of shame feelings.

## Materials and methods

### Participants

The sample comprised 787 participants from the Portuguese general population (144 men and 643 women), with ages ranged between 18 and 40 years. The mean of participants' body mass index was 22.81 kg/m<sup>2</sup> (SD=3.63), ranging from 13.27 and 43.58. The female group presented a mean of 22.65 (SD=3.68) and the male group had a mean of 23.54 (SD=3.30).

### Measures

#### Body mass index

The BMI was calculated by dividing participants' self-reported current weight (in kg) and height (in m<sup>2</sup>).

#### External and Internal Shame Scale (EISS; Ferreira et al. 2009)

The EISS is an eight-item self-response measure to evaluate shame. EISS comprises two dimensions: external shame, defined as the perception of existing negatively in the minds of others (e.g. "I feel that other people see me as not meeting their standards"); and internal shame, defined by how one judges the self as flawed, inadequate, or inferior (e.g. "I feel I am different and inferior to others"). Items are answered on a 5-point scale (0="never" to 4="always"). In the original study, EISS presented a Cronbach's alphas of 0.80 and 0.82, for external and internal shame subscales. In this study, Cronbach's alpha values were 0.80 and 0.83 for external and internal shame subscales, respectively.

#### Body Image Shame Scale (BISS [28])

BISS is a self-response measure that evaluates the experience and phenomenology of shame experiences associated with body image. It consists of 14 items divided into two subscales: externalized corporal shame, i.e. the perception that one's body image is negatively evaluated by others and the adoption of defensive behaviours (e.g. "I avoid social

situations (e.g. going out, parties) because of my physical appearance"); and internalized body shame, which involves negative self-perceptions of personal worth on the basis of one's body image, and consequent concealment and avoidance behaviours of body image (e.g. "My physical appearance makes me feel inferior to others"). Participants were asked to respond to items on a 5-point scale (0="never" to 4="almost always"). The scale presents a Cronbach's alpha of 0.92 in the original study [28] and of 0.96 in the present study.

#### Cognitive Fusion Questionnaire-Body Image (CFQ-BI [36])

CFQ-BI is a ten-item measure of cognitive fusion in relation to one's body image. Participants were asked to indicate their degree of accordance with each item (e.g. "My thoughts about my body image disturb me or cause me emotional distress") on a seven-point scale (1="never true" to 7="always true"). CFQ-BI presents a Cronbach's alpha of 0.96, in its original study [36], and of 0.97 in the present study.

#### Binge Eating Scale (BES [8, 39])

BES is a self-report measure for affective, cognitive and behavioural dimensions of binge eating. It comprises 16 items (e.g. "I feel totally unable to control my eating impulses") that include three or four statements that reflect the severity of symptoms (0="no difficulty" to 3="severe binge eating symptoms"). Participants were asked to choose a statement that best described their attitude. BES revealed good psychometric properties with an alpha of 0.85 in the original version [39], of 0.88 in the Portuguese version [8], and of 0.92 in the present study.

### Procedures

In this study, all the ethical and deontological requirements underlying research in Psychology were guaranteed, namely the guarantee of the data's confidentiality and its exclusive use for this research. The sample was collected through an online platform between November 2018 and March 2019.

The disclosure of the study and the recruitment of potential participants were conducted via email, Facebook and Whatsapp, using the snowball sampling method. The invitation for the participation in the study included a brief description of its objectives and procedures. In this invitation, a link that directed to the online version of the research protocol was included, which was composed of an informed consent, questionnaire of biographical data and the self-report measures described above. There were no rewards attributed for the participation.

In total, 884 individuals participated in this study. After internal cleaning procedures based on exclusion criteria (e.g. missing data and participants aged over 40 years), 97 participants were eliminated.

## Data analyses

Data analyses were performed using IBM SPSS Statistics software (v.22, SPSS IBM; Chicago, IL) and using AMOS software.

To analyse the characteristics of the sample, descriptive statistical analyses were performed. To understand the associations between the study variables, a Pearson correlation analysis was conducted. The analysis of the magnitudes of the results followed the recommendations of Cohen and colleagues [40]. To test the predicted structural relationships between variables, a structural equation modelling (SEM) was elaborated. The proposed model sought to explore the association between external and internal shame with binge eating severity, through body image-related shame and cognitive fusion, while controlling for BMI. The maximum likelihood method was used to test the significance of the regression coefficients and to compute a set of goodness-of-fit indices (e.g. Chi square, CFI, TLI, and RMSEA [41]). The direct and indirect effects were tested through Chi-square tests and Bootstrap resampling (with 5000 samples), using a confidence interval of 95%. The effects were considered statistically significant when the  $p$  value is less than 0.05 and if zero was not included in confidence interval [42]. The same procedure of statistical analysis was performed to test the reverse model, that is, whether binge eating severity explains higher levels of shame (internal and external) through higher levels of body image shame and body image-related cognitive fusion. Finally, a multi-group analysis [43] was carried out to test for the significance of the differences between both groups (men and women) among the parameter estimates.

## Results

### Descriptive and correlation analyses

$T$  test for independent samples allowed to verify that men and women presented significant differences in age and years of education. Men presented a higher mean age ( $M=25.42$ ;  $SD=6.06$ ) than women ( $M=24.15$ ;  $SD=5.06$ ;  $t_{(785)}=2.630$ ;  $p=0.009$ ) and a significantly lower mean of years of education ( $M=14.82$ ;  $SD=1.99$ ) in comparison to women ( $M=13.97$ ;  $SD=2.37$ ;  $t_{(190,66)}=-4.005$ ;  $p<0.001$ ). Concerning the differences in other study variables, results demonstrated that women reported higher levels of external and internal shame, body shame, body image-related cognitive fusion and binge eating, in comparison to men. Regarding BMI, as expected, men presented a significant higher value compared to women (Table 1).

Correlational results (Table 2) showed that both external and internal shame showed positive and strong correlations with body shame (BISS) and body image-related cognitive fusion (CFQ-BI), for both men and women. In turn, all of these variables revealed a positive relationship with binge eating (BES), with moderate to strong magnitudes.

Additionally, it was verified that for men BMI does not present significant correlations with any study variables. In contrast, for women, BMI was significantly associated with BISS, CFQ-BI and BES.

### Path analysis

To better understand the relationships between variables, a path analysis explored the effect of external shame and internal shame on binge eating severity (BES), through the mediating effect of body shame and body image-related cognitive fusion, while controlling BMI (Fig. 1).

The model was tested through a saturated model, consisting of 27 parameters. The results indicated that four paths were not significant: the direct effect of internal shame on

**Table 1** Means, standard deviations and differences between the groups in the study variables

	Men ( $n=144$ )		Women ( $n=643$ )		$t$	$p$
	$M$	$SD$	$M$	$SD$		
1. BMI	23.54	3.30	22.65	3.68	2.67	0.008
2. EISS_External	5.34	2.86	6.03	2.86	-2.61	0.009
3. EISS_Internal	3.46	2.72	4.94	3.31	-5.68	0.000
4. BISS	0.59	0.75	1.31	0.98	-9.77	0.000
5. CFQ-BI	21.15	13.76	30.94	17.08	-7.37	0.000
6. BES	6.42	7.10	10.80	9.08	-6.34	0.000

$M$  Mean;  $SD$  Standard deviation,  $BMI$  Body Mass Index,  $EISS\_External$  and  $EISS\_Internal$  EISS subscales (external and internal shame subscale, respectively),  $BISS$  Body Image Shame Scale,  $CFQ-BI$  Cognitive Fusion Questionnaire-Body Image,  $BES$  Binge Eating Scale

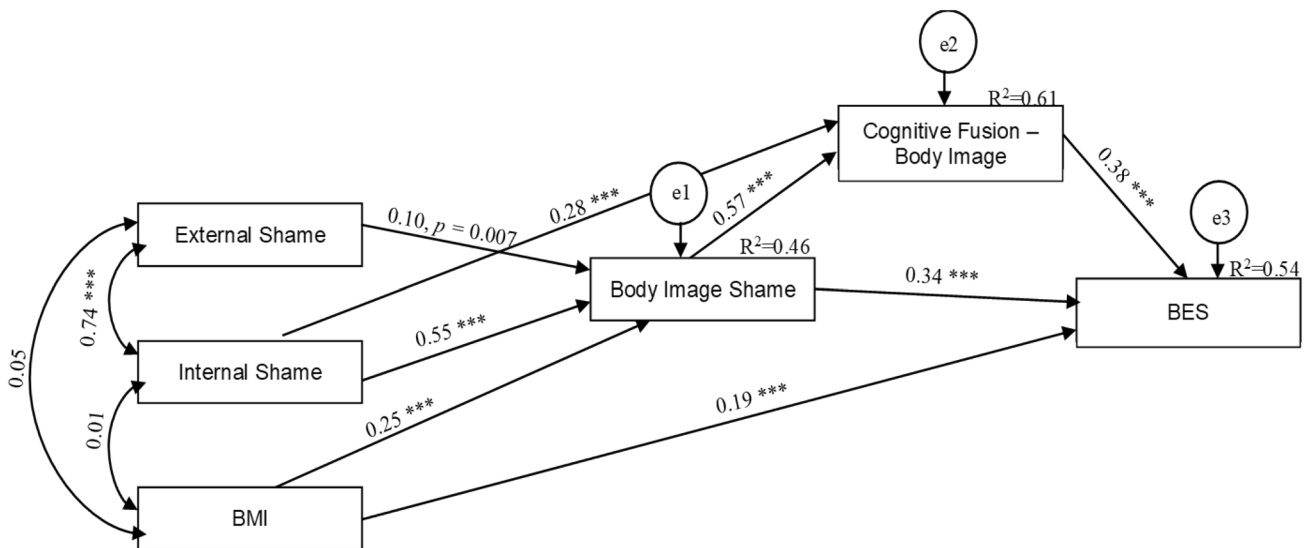
**Table 2** Correlations between studied variables

	1	2	3	4	5	6
1. BMI	–	<b>–0.05</b>	<b>–0.06</b>	<b>0.08</b>	<b>0.07</b>	<b>0.15</b>
2. EISS_External	0.08	–	<b>0.70***</b>	<b>0.42***</b>	<b>0.46***</b>	<b>0.39***</b>
3. EISS_Internal	0.04	0.75 ***	–	<b>0.55***</b>	<b>0.57***</b>	<b>0.51***</b>
4. BISS	0.34***	0.54***	0.62***	–	<b>0.55***</b>	<b>0.62***</b>
5. CFQ–BI	0.18***	0.51***	0.64***	0.76***	–	<b>0.43***</b>
6. BES	0.39***	0.38***	0.43***	0.66***	0.67***	–

Correlations for men ( $n=144$ ) are reported in bold below the diagonal; for women ( $n=643$ ) are reported above

BMI Body Mass Index, EISS\_External and EISS\_Internal EISS subscales (external and internal shame subscale, respectively), BISS Body Image Shame Scale, CFQ-B Cognitive-Fusion Questionnaire-Body Image, BES Binge Eating Scale

\*\*\* $p < 0.001$



**Fig. 1** Path model showing the association between external and internal shame and severity of binge eating mediated by body image-related shame and cognitive fusion, with standardized estimates and square multiple corrections ( $R^2=0.54$ ;  $N=787$ ). Note. \*\*\* $p < 0.001$

BES ( $b_{bes} = -0.00$ ;  $SE_b = 0.11$ ;  $Z = -0.03$ ;  $p = 0.977$ ); of external shame on body image-related cognitive fusion ( $b_{EISS-external} = 0.02$ ;  $SE_b = 0.20$ ;  $Z = 0.11$ ;  $p = 0.913$ ); of external shame on BES ( $b_{EISS-external} = 0.04$ ;  $SE_b = 0.09$ ;  $Z = 0.41$ ;  $p = 0.684$ ); and of BMI on body image-related cognitive fusion ( $b_{bes} = -0.08$ ;  $SE_b = 0.11$ ;  $Z = -0.73$ ;  $p = 0.463$ ). These paths were progressively eliminated and the model was readjusted.

This model, in which all paths are statistically significant, explains 46% of body shame, 61% of body image-related cognitive fusion and 54% of BES. Also, this model presents an excellent fit to the empirical data [ $\chi^2_{(4)} = 0.72$ ,  $p = 0.949$ , CFI = 1.00; TLI = 1.00; RMSEA = 0.00,  $p = 0.998$ ; 95% CI 0.00–0.00] [42].

Results showed that external shame presented a direct effect of 0.10 on body image-related shame ( $b_{EISS-external} = 0.04$ ;  $SE_b = 0.01$ ;  $Z = 2.70$ ;  $p = 0.007$ );

internal shame had a direct effect of 0.55 on body image-related shame ( $b_{EISS-internal} = 0.16$ ;  $SE_b = 0.01$ ;  $Z = 14.04$ ;  $p < 0.001$ ) and of 0.28 on body image-related cognitive fusion ( $b_{EISS-internal} = 1.48$ ;  $SE_b = 0.15$ ;  $Z = 9.98$ ;  $p < 0.001$ ); in turn, body image-related shame had a direct effect of 0.57 on body image-related cognitive fusion ( $b_{BISS} = 9.88$ ;  $SE_b = 0.49$ ;  $Z = 20.00$ ;  $p < 0.001$ ) and of 0.34 on BES ( $b_{BISS} = 3.06$ ;  $SE_b = 0.35$ ;  $Z = 8.88$ ;  $p < 0.001$ ); body image-related cognitive fusion revealed a direct effect of 0.38 on BES ( $b_{CFQ-BI} = 0.20$ ;  $SE_b = 0.02$ ;  $Z = 10.25$ ;  $p < 0.001$ ); BMI presented a direct effect of 0.25 on body image-related shame ( $b_{BMI} = 0.07$ ;  $SE_b = 0.07$ ;  $Z = 9.57$ ;  $p < 0.001$ ) and of 0.19 on BES ( $b_{BMI} = 0.46$ ;  $SE_b = 0.06$ ;  $Z = 7.39$ ;  $p < 0.001$ ).

The analysis of the indirect effects showed that external shame presented indirect effects of 0.06 (95% CI 0.01/0.11) on body image-related cognitive fusion through body image-related shame; and of 0.06 (95% CI 0.01/0.11)



on BES through body image-related shame and cognitive fusion. Internal shame had indirect effects of 0.31 (95% CI 0.26/0.37) on body image-related cognitive fusion through body image-related shame; and of 0.41 (95% CI 0.36/0.46) on BES through body image-related shame and cognitive fusion. Body image-related shame had indirect effects of 0.22 (95% CI 0.00/0.28) on BES through body image-related cognitive fusion.

To sum up, the model explains 54% of the variance of binge eating symptomatology and reveals that body image-related shame and cognitive fusion mediate the impact of external and internal shame on binge eating severity.

To further support path analysis' findings, a reverse mediation path analysis was conducted. This analysis revealed that the reverse order produces an adjustment adequate to the empirical data: CMIN/DF=1.04; TLI=1.00, CFI=1.00; RMSEA=0.01,  $p=0.88$ ; 95% CI 0.00–0.06.

### Multi-group analysis

The multi-group analysis results revealed the absence of statistically significant differences in relation to factorial weights [ $\chi^2_{(8)}=14.54$ ;  $p=0.069$ ], demonstrating the invariance of the model in both groups (men and women).

## Discussion

This study aimed to investigate the role of external and internal shame on binge eating severity when mediated by body image-related shame and cognitive fusion in a sample composed by men and women from the community. Besides, this study explored the differences between men and women in binge eating severity and related emotional mechanisms and the plausibility of this mediational model for both men and women.

Significant differences were found between men and women in study variables. Women reported higher levels of external and internal shame, body image-related shame and cognitive fusion, as well as binge eating symptomatology in comparison to men. These findings are consistent with prior research [11, 38, 44] and seem to support that women present greater vulnerability for body and eating problems compared to men.

Correlational results indicated that both external and internal shame experiences were positively associated with binge eating severity. This finding is consistent with previous studies (e.g. [5, 7]) but also adds new evidence to the literature by showing that the association between external and internal shame with binge eating symptomatology was similar, both in men and women. Additionally, and as expected, positive associations between experiences of shame, body image-related cognitive fusion and binge eating

severity were found. Duarte and Pinto-Gouveia [38] documented that, in women with binge eating disorder, shame experiences are associated with body image-related cognitive fusion and binge eating severity. Our study seems to be in accordance with these results, extending them to the general population. Moreover, the current findings showed that the experiences of shame are also associated with body image-related cognitive fusion and binge eating severity in a male sample.

Path analysis suggested that both external and internal shame have an impact on binge eating symptomatology via increased body image-related shame and cognitive fusion, even when controlling for BMI. Particularly, the tested model explained a total of 54% of binge eating severity variance, and suggested that body image-related shame and cognitive fusion are significant mediators. The model presented an excellent fit to the empirical data explaining and revealing to be plausible for both men and women. Based on the literature, we hypothesized that there is a self-perpetuate cycle between shame and binge eating. In accordance, a reverse model was tested to explore plausibility of binge eating behavior influence shame experiences. Results revealed an excellent adjustment to the empirical data and seem to corroborate a two-way relationship between binge eating symptoms and shame. These data not only suggest that people who report higher levels of shame tend to engage in more binge eating episodes, but also suggest that higher severity of binge eating tend to activate higher levels of external and internal shame, through higher levels of body image-related shame and cognitive fusion.

However, there are important limitations that need to be considered. First, the cross-sectional nature of the study does not allow the establishment of causal relationships between the variables. Second, the study's sample was self-selected, which may limit the generalization of the results, and data were collected online, which can produce a bias sample. Also, our data may be constrained by limitations related to the use of sample mostly composed by female participants. Upcoming studies should, therefore, examine this model using larger and more homogenous samples in relation to gender distribution. Third, the use of self-report measures may also represent a limitation. Finally, the current study tested a parsimonious model to explain binge eating severity. Given the multi-determined nature of disordered eating, this is an incomplete model and other potentially relevant mechanisms (such as striving or submission) and other uncontrolled variables on the examined associations should be explored further in future studies.

Nonetheless, this study seems to have important research and clinical implications. Findings suggested that both external and internal shame experiences have a significant impact on the tendency to engage in binge eating episodes, which corroborate the importance of both shame dimensions in the

conceptualization, prevention and treatment of disordered eating. Also, this study highlighted the role of body image-related shame and cognitive fusion as mediator mechanisms that influence the relationship between negative affect and binge eating, for both men and women. These data seem to underline the importance of targeting more adaptive emotional processes (as an alternative to cognitive fusion) in individuals reporting symptoms of binge eating. These findings are consistent with previous studies that indicated the adequacy of mindfulness and compassion-based interventions on promoting body image acceptance and to diminish maladaptive eating behaviours [45]. Moreover, the active inclusion of male participants in this study seems to be a relevant contribution for binge eating research. Indeed, the demonstration of the invariance of the tested model by gender suggests the possibility of creating group interventions for binge eating that include men and women since there were no significant differences in gender, regarding the role of binge eating underlying mechanisms.

## Compliance with ethical standards

**Conflict of interest** The authors of this manuscript declare no conflict of interest.

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This study was approved by the Ethical Board of the Faculty of Psychology and Education Sciences of the University of Coimbra.

**Informed consent** Informed consent was obtained from all individual participants included in the study.

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