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## Early Parental Eating Messages and Disordered Eating: The Role of Body Shame and Inflexible Eating

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### ABSTRACT

The current study tested a path model that examined the association between early caregiver eating messages (restrictive and pressure to eat) and current disordered eating and whether body image shame and inflexible eating mediate this relationship, in a sample of 433 women aged from 18 to 40. Correlation analyses showed that the recall of restrictive/critical caregiver eating messages is linked to body image shame, inflexible eating and disordered eating. Path analysis results indicated the plausibility of the tested model, which accounted for 70% of the variance of disordered eating. Findings suggested that women who recall more restrictive/critical caregiver eating messages tend to present more body image-focused shame experiences and to adopt more inflexible eating rules and, consequently, engage in disordered eating and behaviors. This study contributes to a better understanding of the impact of early caregiver eating messages on disordered eating behaviors and also emphasizes the impact of maladaptive emotions and strategies, such as body image shame and adherence to inflexible eating rules on the display of disordered eating. Therefore, this paper may offer important insights for future research and for the development of intervention programs.

### ARTICLE HISTORY

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### KEYWORDS

Caregiver eating messages; body image shame; inflexible eating; disordered eating; path analysis

Literature has highlighted the importance of the influence of parenting practices on several children development outcomes (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Maccoby, 2000). Particularly, several reports have shown that children may learn some parental eating behaviors through a process of parenting modeling of eating behaviors (e.g., Cutting, Fisher, Grimm-Thomas, & Birch, 1999), via parenting feeding practices (Edmunds & Hill, 1999; Fisher & Birch, 1999), or via the reception of direct messages regarding their eating behaviors and weight (e.g., Baker, Whisman, & Brownell, 2000). Parental feeding practices, restriction and overcontrol are believed to have a fundamental impact on children's body image and eating behavior, and also to contribute for the determination of their patterns of food intake and selection (Fisher, Sinton, & Birch, 2009). For example, a study conducted by Francis and Birch (2005)

showed that mothers' encouragement of daughters' weight loss was linked to daughters' restrained eating behavior. Some evidences support that early caregiver (e.g., parents, grandparents, daycare providers) messages about children's eating (i.e., those related to restricting children's food intake or pressuring them to eat) and weight are associated to children's disordered body attitudes and eating behaviors (e.g., Abramovitz & Birch, 2000; Birch & Fisher, 2000). In fact, parents often worry about their children's health and so they try to increase children's intake of nutrient dense foods (e.g., "eat vegetables") or restrict children's access to and intake of "unhealthy" or "junk" foods (e.g., "you can't have any cookies"; Savage, Fisher, & Birch, 2007). Parents use these strategies to promote healthier habits in children, and perhaps even prevent obesity. However, the results of research reveals such attempts can have negative effects on children's food preferences and their self-regulation of energy intake (Savage et al., 2007).

In addition, feeding control practices and messages may likely continue to influence body attitudes and eating behaviors, even after the decrease or cease of children's direct exposure to these messages (Kotler, Cohen, Davies, Pine, & Walsh, 2001). Furthermore, several accounts have suggested that one's perceptions of the messages received from caregivers about what to eat, when do eat, and how much to eat are associated to one's body dissatisfaction, body shame and disordered eating (e.g., Daye, Webb, & Jafari, 2014; Kroon Van Diest & Tylka, 2010). Additionally, perceptions about eating messages received from caregivers (restrictive and critical or pressure to eat) can be experienced as body-related shaming experiences (Daye et al., 2014; Kroon Van Diest & Tylka, 2010). Aforementioned research data support the growing recognition of the power of caregiver eating messages on later eating behavior and body image (e.g., Kroon Van Diest & Tylka, 2010; Rodgers & Chabrol, 2009).

Because body image constitutes a dimension of the self which is susceptible to be overly valued and by others, one's body weight and shape may represent an influential source of shame, especially in women (e.g., Duarte, Pinto-Gouveia, Ferreira, & Batista, 2015; Gilbert, 2000; Goss & Gilbert, 2002). According to Gilbert (2002), the painful emotion of shame arises in the context of human competition for social attractiveness. Body image shame involves one's negative evaluations regarding one's own physical features (body shape, size or weight) that are also believed to be viewed by others as unattractive, which places oneself in a vulnerable and unwanted social rank (Gilbert, 2002, 2007). Specifically, the perception that one's body is unattractive and/or significantly different from the socially desired beauty ideal has been considered as a source of distress, and as a trigger of body image and eating-related difficulties, especially among women (e.g., Bessenoff & Snow, 2006; Castonguay, Brunet, Ferguson, & Sabiston, 2012; Duarte et al., 2015; Goss & Gilbert, 2002). In accordance with previous studies (Duarte, Ferreira, Trindade, & Pinto-Gouveia, 2016; Ferreira, Trindade, & Martinho, 2016), when women feel dissatisfied with one's body image and perceive that others evaluate their body image them in a negative way, they may adopt disordered eating behaviors (such as inflexible eating rules) as a strategy to become closer to a valued ideal, to gain positive attention and to avoid a threatening position in the social group. Indeed, inflexible eating rules may be understood as maladaptive control strategies to attempt to change what is perceived to be the cause of shame—one's body weight and/or shape.

A newly studied construct in the field of eating and body image is inflexible eating, defined as the adherence to inflexible and subjective eating rules, while avoiding or disregarding internal (e.g., hunger) or external (e.g., social contexts as parties, get-togethers and other social events) contingencies, with a sense of control when meeting such rules and emotional distress when feeling that one has failed to do so (Duarte, Ferreira, Pinto-Gouveia, Trindade, & Martinho, 2017; Ferreira et al., 2016). Inflexible eating thus consists of a disconnection from contextual cues and the rigid adherence to eating rules, promoting possible adverse consequences (Duarte et al., 2016, 2017). Duarte and colleagues (2017) suggested that when individuals adhere to inflexible dietary rules that are rigidly followed, while ignoring other sources of eating regulation, they may be at risk for eating disorders. In fact, research conducted with young women showed that inflexible eating (i.e., psychological inflexibility focused on eating) was highly associated with other psychological processes that have been demonstrated as central for disordered eating (Ferreira et al., 2016). Hence, inflexible eating may be a key factor for understanding eating disorders.

Even though the impact of caregiver negative eating messages on disordered eating behaviors has been documented, processes of emotional regulation and mechanisms which may explain this relationship remain scarcely explored. Additionally, considering the relevance of body image shame and inflexible eating rules for eating disorders, the aim of this study was to test an integrative model to examine the relationship between caregivers' eating messages and disordered eating, and to test whether body image shame and inflexible eating rules significantly act on this association, using an adult female sample. We hypothesized that body image shame and inflexible adherence to eating rules fully mediate the association between certain caregiver eating messages (restriction of food intake and pressures to eat) and disordered eating attitudes and behaviors.

## Material and Methods

### Participants

Participants ( $N=433$ ) were women from the Portuguese general population ( $n=197$ ), some of which ( $n=236$ ) were university students. The mean age was 23.26 ( $SD=4.36$ ), ranging from 18 to 40 years. The mean of completed years of education was 14.62 ( $SD=1.94$ ). No differences were found regarding age and years of education between individuals from the general population and university students (age -  $t_{(431)} = -18.39$ ,  $p < .001$ ; years of education -  $t_{(431)} = -10.52$ ,  $p < .001$ ). Participants' body mass index (BMI) ranged from 16.22 and 40.90, with a mean of 22.31 ( $SD=3.59$ ), which corresponds to normal weight values (WHO, 1995). Furthermore, the sample's BMI distribution was revealed to be equivalent to the female Portuguese population (Poínhos et al., 2009).

### Measures

#### Demographics

Participants completed a demographic questionnaire (age, sex, nationality, area of residence, education level and current weight and height).

### ***Body Mass Index***

Participants' BMI was calculated through the Quetelet Index and was based on self-reported weight and height values ( $\text{Kg}/\text{m}^2$ ).

### ***The Caregiver Eating Messages Scale***

(CEMS; Kroon Van Diest & Tylka, 2010). CEMS is a 10-item measure of participants' recollections about messages received from their caregivers regarding one's eating behaviors. This scale contains two subscales: caregivers' restrictive/critical messages ("Told you that you shouldn't eat certain foods because they will make you fat") and pressure to eat messages ("Made sure you finished all the food that was on your plate"). Participants respond to each item using a six-point scale ranging from 1 ("never") to 6 ("always"). High levels of internal consistency have been demonstrated for the restrictive/critical ( $\alpha = .82$ ) and pressure to eat ( $\alpha = .86$ ) scales in original work. In the current study, the Cronbach's alpha was .89 for restrictive messages subscale and .85 for pressure to eat messages subscale.

### ***Body Image Shame Scale***

(BISS; Duarte et al., 2015). BISS is a 14-item self-report scale, which was developed to measure the experience and phenomenology of body image shame. This scale comprises two subscales: external body shame (i.e., perceptions that one is negatively evaluated or judged by others because of one's physical appearance; "I feel uncomfortable in social situations because I feel that people may criticize me because of my body shape") and internal body shame (i.e., negative self-evaluations due to one's physical appearance; "When I see my body in the mirror I feel I am a defective person."). Respondents are asked to rate each item according to their own experience of body image shame, using a five-point scale ranging from 0 ("never") to 4 ("almost always"). In the current study, the global score of the BISS was used. This scale has shown good internal consistencies both in the original ( $\alpha = .92$ ) and in the current study ( $\alpha = .95$ ).

### ***Inflexible Eating Questionnaire***

(IEQ; Duarte et al., 2017). The IEQ is an 11-item self-report scale which was developed to measure the inflexible adherence to subjective eating rules ("Not following my eating rules makes me feel inferior."). Items are rated in a five-point Likert-type scale ranging from 1 ("totally disagree") to 5 ("totally agree"). This scale was shown to hold strong psychometric qualities, with a Cronbach's alpha value of .95 and .93 in the original and in the current study, respectively.

### ***Eating Disorder Examination Questionnaire***

(EDE-Q; Fairburn & Beglin, 1994; Machado et al., 2014). This scale is a 36-item self-report questionnaire adapted from the Eating Disorder Examination Interview, to assess disordered eating attitudes and behaviors. It consists of four subscales: restraint ("Have

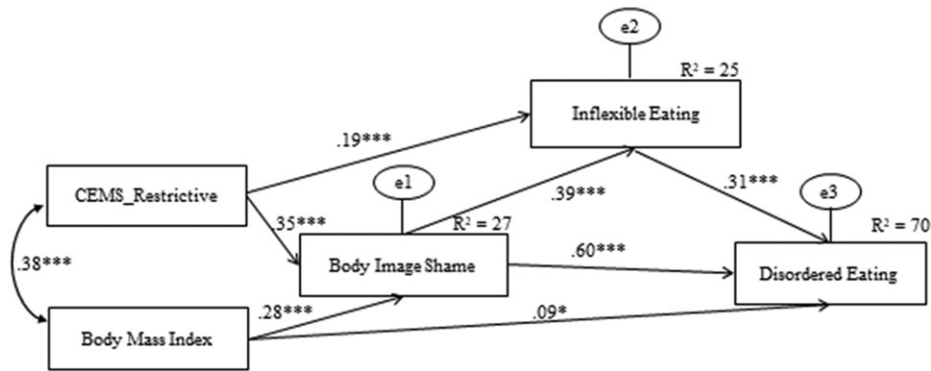
you been deliberately trying to limit the amount of food you eat to influence your shape or weight?”), eating concern (“Has thinking about food, eating, or calories made it very difficult to concentrate on things you are interested in – for example, working, following a conversation, or reading?”), shape concern (“Have you felt fat?”) and weight concern (“Have you had a strong desire to lose weight?”). The items are rated for frequency and severity of disordered eating attitudes and behaviors, within a 28-day time frame. The EDE-Q presented good psychometric properties ( $\alpha = .94$ , for both the original and the Portuguese studies); regarding the current study, the Cronbach’s alpha was .95.

### **Procedures**

The current study was part of a wider research about the role of different emotion regulation processes on women’s mental health. Data collection and other study procedures respected all ethical and deontological requirements inherent to scientific research and the study was approved by the Ethical Board of the Faculty of Psychology and Education Sciences of the University of Coimbra. This study sample included university students and participants from the general community. An invitation to participate in this study was electronically sent through social networks and e-mail to potential participants (i.e., the exponential non-discriminative snowball sampling method was used to spread invitations among potential participants; Heckathorn, 2011). Attached to the invitation were detailed information regarding the purpose and procedures of the study, data conditionality, the voluntary nature of the participation and a link to the online platform with the informed consent form and self-report questionnaires to be answered to. The initial sample was composed of 630 individuals. However, taking into account the purpose of the current study, data cleaning procedures excluded: (a) male participants ( $n = 133$ ) and (b) participants younger than 18 years old and older than 40 years old ( $n = 64$ ).

### **Data Analyses**

Descriptive and correlational analyses were conducted using the software IBM SPSS (v.21 SPSS; Armonk, NY: IBM Corp.). The AMOS software was used to examine the proposed theoretical model (Figure 1) which tested the hypothesis that caregivers eating messages (exogenous, independent variable) would present a significant effect on eating disordered (endogenous, dependent variable), through the mediational effects of body image shame and inflexible eating (endogenous, mediator variables), while controlling the effect of BMI. The maximum likelihood method was used for the estimation of the regression coefficients and fit statistics in the path model. The adequacy of the model was examined considering the following goodness of fit indices: chi-square ( $\chi^2$ ), that when nonsignificant indicates a very good model fit; the normed chi-square (CMIN/df), that indicates an acceptable fit when  $< 5$ ; the Comparative Fit Index (CFI) and Tucker Lewis Index (TLI), which indicate a very good fit with values above .95; and the root mean square error of approximation index (RMSEA), which indicates an adequate fit when values  $< .08$  (Kline, 2005; Tabachnick & Fidell, 2013). Furthermore, the Bootstrap resampling procedure, with 5000 samples, and 95% bias-corrected confidence intervals (CI) around the standardized estimates of total, direct and indirect effects was



**Figure 1.** Final path model.

Note. \*\*\* $p < .001$ ; \*  $p < .050$ ; CEMS\_Restrictive (as measure by Caregiver eating messages scale—subscale restrictive/critical messages); Body Image Shame (as measure by Body Image Shame Scale); Inflexible Eating (assessed by Inflexible Eating Questionnaire); Disordered Eating (as measure by Eating Disorder Examination Questionnaire).

conducted to test the significance of the mediational paths. The effect is statistically significant ( $p < .05$ ) if zero is not included between the lower and the upper bound of the 95% bias corrected confidence interval (Kline, 2005).

Finally, since the sample of the study comprises a significant number of university students, and of individuals from the general population, the suitability of the tested model was explored between both groups. A multigroup analysis was performed and revealed that there were no differences between factor weights ( $\chi^2_{(7)} = 10.55$ ;  $p = .160$ ).

## Results

### Descriptive and Correlation Analyses

Descriptive statistics and correlations between the study's variables are reported in Table 1. Results from correlation analysis showed that caregiver restrictive eating messages (CEMS\_Restrictive) revealed positive and moderate associations with body image shame (BISS), with inflexible eating (IEQ) and with disordered eating (EDE-Q). Body image shame (BISS) and inflexible eating (IEQ) presented a positive and moderate correlation with each other. In turn, body image shame (BISS) and inflexible eating (IEQ) showed a strong and positive association with disordered eating (EDE-Q).

Finally, BMI presented significant and positive associations with inflexible eating (with a weak correlation magnitude) and with caregiver restrictive eating messages, body image shame and disordered eating (with moderate magnitudes), respectively. Caregiver pressure to eat messages revealed nonsignificant association with none of the measures study (Cohen, Cohen, West, & Aiken, 2003) and thus this dimension was not included in further analysis (path analysis).

### Path Analysis

Path analysis was performed to test whether the body image shame (BISS) and inflexible adherence to subjective eating rules (IEQ) mediate the impact of the perceived caregiver

**Table 1.** Means (*M*), Standard Deviations (*SD*) and Correlations Between the Study Measures (*N* = 433).

Measures	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.
1. BMI	22.31	3.59	—	—	—	—	—
2. CEMS_Restrictive	1.81	.94	.38***	—	—	—	—
3. CEMS_PressureToEat	3.30	1.09	-.08	.03	—	—	—
4. Body Image Shame	15.35	12.20	.41***	.45***	.00	—	—
5. Inflexible Eating	29.99	10.19	.28***	.36***	.01	.48***	—
6. Disordered Eating	1.17	1.10	.42***	.45***	-.03	.78***	.62***

Note. BMI = body mass index; CEMS\_Restrictive (as measure by caregiver eating messages scale—subscale restrictive/critical messages); CEMS\_PressureToEat (assessed by caregiver eating messages scale—subscale pressure to eat messages); Body Image Shame (as measure by Body Image Shame Scale); Inflexible Eating (assessed by Inflexible Eating Questionnaire); Disordered Eating (as measure by Eating Disorder Examination Questionnaire).

\*\*\* $p < .001$ .

eating messages (CEMS\_Restrictive) on disordered eating attitudes and behaviors (EDE-Q), while controlling the effect of BMI.

First, the path model was tested through a saturated model (i.e., zero degrees of freedom), comprising 27 parameters, which explained 70% of disordered eating attitudes and behaviors (EDE-Q). Results indicated that five of the paths were not significant: the direct effect of the pressure to eat messages on inflexible adherence to eating rules ( $b_{\text{CEMS\_PressureToEat}} = .09$ ;  $SE_b = .39$ ;  $Z = .24$ ;  $p = .810$ ); the direct effect of the pressure to eat messages on body image shame ( $b_{\text{CEMS\_PressureToEat}} = .13$ ;  $SE_b = .46$ ;  $Z = .28$ ;  $p = .782$ ); the direct effect of the pressure to eat messages on disordered eating ( $b_{\text{CEMS\_PressureToEat}} = -.03$ ;  $SE_b = .03$ ;  $Z = -.95$ ;  $p = .343$ ); the direct effect of BMI on disordered eating ( $b_{\text{BodyMassIndex}} = .20$ ;  $SE_b = .13$ ;  $Z = 1.49$ ;  $p = .138$ ) and the direct effect of restrictive and critical messages on disordered eating (rules ( $b_{\text{CEMS\_Restrictive}} = .05$ ;  $SE_b = .36$ ;  $Z = 1.487$ ;  $p = .137$ ). These paths were progressively eliminated and the model was readjusted.

The final model (Figure 1) presented an excellent fit with a nonsignificant chi-square [ $\chi^2(5) = 5.434$ ;  $p = .365$ ], and an excellent fit to the empirical data, as indicated by the analysis of well-known and recommended goodness of fit indices (CMIN/DF = 1.087; CFI = .999; TLI = .998; RMSEA = .014;  $p = .809$ , IC = .00/.07; Kline, 2005). This model, in which all path coefficients were statistically significant ( $p < .05$ ), explained 70% of disordered eating's variance. Moreover, the model accounted for 27% and 25% of body image shame and inflexible eating's variances, respectively. Specifically, restrictive and critical messages presented a significant direct effect on body image shame ( $\beta = .35$ ;  $b_{\text{CEMS\_Restrictive}} = 4.49$ ;  $SE_b = .58$ ;  $Z = 7.80$ ;  $p < .001$ ) and on inflexible eating ( $\beta = .19$ ;  $b_{\text{CEMS\_Restrictive}} = 2.01$ ;  $SE_b = .50$ ;  $Z = 3.99$ ;  $p < .001$ ). BMI had a direct effect on body image shame ( $\beta = .28$ ;  $b_{\text{BodyMassIndex}} = .94$ ;  $SE_b = .15$ ;  $Z = 6.23$ ;  $p < .001$ ), and on disordered eating ( $\beta = .09$ ;  $b_{\text{BodyMassIndex}} = .03$ ;  $SE_b = .01$ ;  $Z = 3.01$ ;  $p = .003$ ). Body image shame had a direct effect on inflexible eating ( $\beta = .39$ ;  $b_{\text{BodyImageShame}} = .33$ ;  $SE_b = .04$ ;  $Z = 8.453$ ;  $p < .001$ ) and on disordered eating ( $\beta = .60$ ;  $b_{\text{BodyImageShame}} = .06$ ;  $SE_b = .003$ ;  $Z = 18.78$ ;  $p < .001$ ). It was also verified that inflexible adherence eating rules had a direct effect of .31 on disordered eating ( $b_{\text{InflexibleEatingRules}} = .03$ ;  $SE_b = .003$ ;  $Z = 10.327$ ;  $p < .001$ ).

The analysis of indirect effects showed that BMI presented indirect effects on disordered eating through body image shame and inflexible eating of .11 (95% CI = .07–.15) and .20 (95% CI = .14–.27), respectively. The restrictive and critical messages showed



an indirect effect on disordered eating through body image shame and inflexible eating of .14 (95% CI = .09–.18) and .31 (95% CI = .23–.38), respectively.

Overall, the analysis of this model accounted for 70% of disordered eating attitudes and behaviors' variance and revealed that body image shame and inflexible eating mediate the impact of perceived caregiver eating messages on disordered eating attitudes and behaviors. Additionally, through calculation of squared beta values of indirect effects, it was possible to verify that 60.8% of EDE-Q's variance was explained by indirect effects.

To further support path analysis' findings, a reverse mediation path analysis was conducted. This analysis revealed that the reverse order does not produce an adjustment so adequate to the empirical data compared to the tested model (Figure 1): CMIN/DF = 1.38; TLI = .99, CFI = .99; RMSEA = .03,  $p = .56$ ; 95% CI = .00–.10).

## Discussion

Empirical studies have emphasized the link between parental feeding practices (such as tendency to restrict children's food intake or to make critical comments about their eating), and later individual's disordered body attitudes and eating behaviors (e.g., Marcos, Sebastián, Aubalat, Ausina, & Treasure, 2013; Rodgers, Paxton, & Chabrol, 2009). Nevertheless, the mechanisms which may explain this relationship remained scarcely explored. The main aim of this paper was to test an integrative model that explored the effect of recall specific caregiver eating messages on disordered eating and the mediator roles of current feelings of shame based on body image and the adoption of inflexible rules eating in this association, while controlling the effect of BMI.

In accordance with previous literature (Kroon Van Diest & Tylka, 2010), present correlation analyses showed that restrictive and critical eating messages were related in a positive direction with defensive and maladaptive responses (such as body image shame and inflexible eating rules) and disordered eating. Moreover, results corroborated prior research by demonstrating that body image-related difficulties and the adherence to inflexible rules were strongly linked with each other (Ferreira et al., 2016; Goss & Gilbert, 2002) and both with eating disordered (e.g., Duarte et al., 2017; Goss & Gilbert, 2002). In line with previous studies (e.g., Kroon Van Diest & Tylka, 2010), results also confirmed that pressure to eat caregiver messages were not correlated with other variables examined. In fact, Kroon Van Diest and Tylka (2010) suggested that the perception of early caregiver pressure to eat certain foods, or to eat in absence of hunger or beyond satiety, is not associated with later body image and eating-related difficulties.

Findings from path analysis revealed the examined model to present an excellent fit to empirical data, accounting for 70% of the variance of disordered eating attitudes and behaviors. Furthermore, results revealed that 27% of body image shame's variance was explained by restrictive/critical eating messages. Additionally, the analysis of this model suggested that 25% of the variance of inflexible eating rules was directly explained by the evocation of caregiver restrictive eating messages and through body image shame. Also, results revealed that caregivers' restrictive eating messages explained higher levels of disordered eating via higher levels of body image shame and inflexible eating rules, while controlling the effect of BMI. These results are in line with research on the role that recollections of body image and eating-related early messages play on later body

and eating difficulties (e.g., Duarte & Pinto-Gouveia, 2017; Fortesa & Ajete, 2014). The present study also seems to suggest that the relationship between caregivers' restrictive/critical eating messages and current eating disordered behaviors is complex and influenced by different mechanisms. Indeed, results indicated that women who perceive higher restrictive eating messages by their early caregivers present higher levels of eating disorders symptomatology. This relationship was mediated by perceptions of social inferiority regarding body image (body image shame) and inflexible subscription of eating rules, which seem to explain higher levels of eating disordered among women. This result seems to suggest that women who tend to experience body image shame, also tend to adopt inflexible eating rules. In fact, empirical data have shown that negative evaluations of body image tend to be associated with higher inflexibility concerning eating rules (Ferreira et al., 2016). Overall, the present study seems to emphasize the link between restrictive and critical parental eating messages and body shame and inflexible eating, and to highlight the importance of addressing body image shame and inflexible eating rules in interventions in eating-related difficulties in women.

Despite its contributions, this study's limitations need to be addressed. First, the main limitation is the cross-sectional design of the study, particularly when used to examine a hypothetical mediation may promote considerably biased estimates of longitudinal parameters and hence restrain the establishment of causal conclusions among the variables (Maxwell & Cole, 2007). Future research should use longitudinal designs to explore the attained associations among variables over time. Additionally, the use of self-report measures is an important limitation, because it may be susceptible to biases. For example, the CEMS measures individual's perceptions of caregiver eating messages based on retrospective memories, which may raise some concerns regarding the reliability of such recollections.

Nevertheless, some studies have shown that retrospective data is relatively reliable and stable over time, and that it is stable even in the face of considerable changes in mood, emotional states and social desirability biases (Brewin, Andrews, & Gotlib, 1993; Gerlsma, Kramer, Scholing, & Emmelkamp, 1994). Also, our data may be constrained by limitations related to the use of a sample exclusively composed of female participants. Even though eating psychopathology is more prevalent in women, men also experience body image and eating-related difficulties and this study sample does not allow the generalization of the attained results. Thus, upcoming studies should investigate this model in male samples and explore gender differences. Furthermore, future research should also investigate these associations in larger samples and, in particular, the plausibility of this mediational model in clinical samples. Finally, although the main aim of the current study was to specifically address the mediating role of body image shame and inflexible eating rules, the complex nature of eating psychopathology presupposes the existence of other relevant variables in the link between individuals' perception of caregivers eating messages and disordered eating. Future studies should then expand on this model by testing different mediating mechanisms, such as self-esteem, food acceptability (i.e., open to eating a range of foods; Satter, 1986).

To sum up, the present study seems to support that women's perception of restrictive and critical eating messages received from caregivers may be associated with the engagement in defensive responses and maladaptive strategies (such as body image shame and

inflexible eating rules), which may trigger disordered eating attitudes and behaviors. In this line, these findings have potential implications for researchers and clinicians working with individuals who present disordered eating symptomatology. Moreover, our results support the relevance of evaluating caregivers' messages about eating, current experiences of body image shame and the adherence to inflexible eating rules, especially due to its paradoxical defensive function and maladaptive character. Treatment approaches should focus on helping individuals understand these functions, develop more adaptive strategies to regulate negative emotional experiences and promote psychological flexibility in the context of eating regulation. Also, results seem to underline the importance developing prevention programs which increase caregivers' awareness of the paradoxical nature of their restrictive eating messages, that is while intended to promote their children's health, they end up having a negative impact on their children's relationship with eating. Moreover, these prevention programs should also be designed to teach parents how to replace these maladaptive messages with adaptive messages about food and eating. For example, research shows that parents of overweight children were more concerned with their child's weight status and more likely to control their feeding by restricting their food intake (Campbell et al., 2010; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Noor et al., 2012). Therefore, it is possible that, in overweight and obese children, food intake becomes more regulated by external factors (such as comments from parents), which may have a pervasive effect by disconnecting individuals from their satiety and hunger clues (Eneli, Crum, & Tylka, 2008; Satter, 2005; Tylka, 2006). Also, other children's characteristics, such as impulsivity, may also prompt parental restrictive messages. Research suggests that impulsivity can influence eating behaviors (Graziano, Calkins, & Keane, 2010). In fact, high sensitivity to reward may predispose children to prefer highly palatable foods and may encourage their consumption in the absence of hunger (Hofmann, Ardelt-Gattinger, Paulmichl, Weghuber, & Blechert, 2015), poorer food choices, and overeating (Jasinska et al., 2012). So, in these children, parental controlling feeding practices are commonly used to influence children's weight and eating behaviors (Ogden, Cordey, Cutler, & Thomas, 2013), often without yielding the desired outcomes (Gibbs & Forste, 2014; Ogden et al., 2013; Ventura, Inamdar, & Mennella, 2015).

Therefore, these findings contribute to the understanding of the problematic of disordered eating patterns and seem to represent a new avenue for future research and for the development of intervention programs.

## Author Notes

*Sara Oliveira* is a researcher at the University of Coimbra (Portugal). She is currently interested in studying body image, eating psychopathology and well-being, as well as the impact of ACT and CFT-based interventions in this field.


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