



FACULDADE DE MEDICINA  
UNIVERSIDADE D  
COIMBRA

**MESTRADO INTEGRADO EM MEDICINA – TRABALHO FINAL**

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***PERFECTIONISM, RUMINATION AND EATING  
PSYCHOPATHOLOGY: THE GENDER ROLE***

ARTIGO CIENTÍFICO ORIGINAL

ÁREA CIENTÍFICA DE PSICOLOGIA MÉDICA

Trabalho realizado sob a orientação de:

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Fevereiro de 2022

***PERFECTIONISM, RUMINATION AND EATING PSYCHOPATHOLOGY: THE  
GENDER ROLE***

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## RESUMO

**Introdução:** O perfeccionismo e a ruminação têm sido associados à psicopatologia alimentar cuja prevalência é mais acentuada em mulheres. Contudo, a relação entre estes três construtos e o género ainda não foi totalmente compreendida.

**Objetivos:** O presente estudo pretende investigar o papel moderador das subescalas do perfeccionismo (componente socialmente prescrita e a auto-orientada) e do género na relação entre a ruminação (nas formas *brooding* e reflexiva) e a psicopatologia alimentar, controlando o índice de massa corporal, numa amostra saudável.

**Metodologia:** A amostra foi constituída por 230 participantes (130 mulheres e 92 homens), com idades entre os 18 e os 69 anos, recrutados através de redes sociais. Os participantes preencheram um questionário composto por dados sociodemográficos e escalas de autorresposta para medir o perfeccionismo, ruminação sobre a alimentação, peso e forma corporal, e sintomas de psicopatologia alimentar.

**Resultados:** O perfeccionismo socialmente prescrito tem um efeito moderador na relação entre a ruminação (tanto na dimensão *brooding* como na reflexiva) e a psicopatologia alimentar, ao contrário do perfeccionismo auto-orientado e do género.

**Discussão e Conclusão:** Estes resultados poderão ser relevantes na prevenção e tratamento de perturbações do comportamento alimentar, pois trabalhar nos traços de perfeccionismo socialmente prescrito pode prevenir o desenvolvimento de psicopatologia alimentar em indivíduos com elevados níveis de ruminação sobre a alimentação, peso e forma corporal.

**Palavras-chave:** perfeccionismo, ruminação, psicopatologia alimentar, género.

## **ABSTRACT**

**Introduction:** Perfectionism and rumination have each been associated with eating psychopathology, with women being more affected. However, the relationship between these three constructs and gender has not been fully clarified.

**Objectives:** The present study aims to investigate the moderating effect of perfectionism subscales (socially prescribed and self-oriented components) and gender on the relationship between rumination (brooding and reflection forms) and eating psychopathology, controlling for body mass index, in a healthy sample.

**Methods:** The sample consisted of 230 participants (138 women, 92 men), with ages ranging between 18 and 69, recruited through social media. Participants completed a questionnaire containing sociodemographic data and self-report scales measuring perfectionism, rumination about eating behaviours, weight and body shape, and eating disorder symptoms.

**Results:** Socially prescribed perfectionism has a moderating effect in the relationship between rumination (both brooding and reflection dimensions) and eating psychopathology, in contrast to self-oriented perfectionism and gender.

**Discussion and Conclusion:** These results may be relevant to the prevention and treatment of eating disorders, as working on socially prescribed perfectionistic traits may prevent the development of eating-related psychopathology in patients with high levels of rumination about eating behaviours, weight and body shape.

**KEYWORDS:** perfectionism, rumination, eating disorders, gender.

## INTRODUCTION

The Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5) defines eating disorders as a group of mental disorders that are associated with abnormal eating patterns and may result in physical and psychosocial impairments<sup>1</sup>. They include the three most well-known disorders, anorexia nervosa, bulimia nervosa, and binge eating disorder<sup>1</sup>.

Their actual prevalence is controversial due to methodological issues, differences in definition, and underdiagnosed cases. However, in 2019, Galmiche *et al.*<sup>2</sup> reported the measured average lifetime prevalence of the three most common eating disorders in the population. Anorexia nervosa is expected to affect 1.4 percent of women and 0.2 percent of men, whereas bulimia nervosa is predicted to affect 1.9 percent of women and 0.6 percent of men, and binge eating disorder is estimated to affect 2.8 percent of women and 1.0 percent of men. So, as this meta-analysis shows<sup>2</sup>, eating disorders are more common in women and are known to occur at younger ages: mostly in adolescents and young adults<sup>3</sup>. It is also reported that eating disorders are on the rise worldwide, especially among women<sup>2</sup>.

As previously stated, the existing literature indicates that eating disorders such as anorexia nervosa and bulimia nervosa are less common in men, which can be explained by several factors<sup>4</sup>. The clinical presentation of these pathologies is related to body image concerns in both men and women. However, in men, it has different and more specific aspects: a particularly muscular-oriented body image rather than the thin-ideal internalization. The classic thinness ideal and associated behaviours, such as severe caloric restriction, are central to the diagnosis of anorexia nervosa. This leads to a lower diagnostic sensitivity if this muscle-oriented body image is not considered, which ultimately leads to underdiagnosis<sup>4</sup>. Another reason for underdiagnosis in men is the stigma linked with eating disorders and their strong association with women. It causes men to repress or devalue their symptoms, preventing them from seeking professional care<sup>5</sup>.

Along with the rise of eating disorder diagnoses, subthreshold syndromes and eating disorder symptoms also appear to be increasing in the healthy community population<sup>6</sup>. Some constructs and cognitive processes, such as perfectionism<sup>7,8</sup> and rumination<sup>9,10</sup>, can contribute to this increase and it is worth studying this association with eating disorders because anorexia nervosa has the highest mortality rate among psychiatric disorders<sup>11</sup>.

Perfectionism is a multidimensional construct, defined as the pursuit of unrealistic goals accompanied by excessive self-criticism and a morbid fear of failure<sup>12</sup>. This may lead to psychological distress and self-defeating behaviours, such as procrastination, self-criticism,

and lack of confidence in decision-making<sup>7,12</sup>. It is also associated with various psychopathological conditions such as depression, obsessive compulsive disorder, anxiety disorders and eating disorders<sup>7,8</sup>. Perfectionism has intrapersonal and interpersonal components that take on 3 dimensions: self-oriented, other-oriented, and socially prescribed perfectionism. Self-oriented perfectionism is characterized by high personal expectations, other-oriented perfectionism by high perfection demands on others, and socially prescribed perfectionism by the belief that others impose perfection on oneself<sup>13</sup>. Socially prescribed perfectionism is a main risk factor for developing an eating disorder due to the perception that perfection is expected from others. It can lead to excessive concern about body weight and actions such as very restrictive dieting or excessive physical training in order to achieve the goal set by social norms<sup>14,15</sup>. There seems to be no difference between genders in these perfectionism dimensions<sup>16</sup>.

Rumination is a cognitive process characterized by recurrent thought forms that focus on negative emotions and emphasize pessimistic causes and consequences<sup>17</sup>, and women are more often affected<sup>9</sup>. There are two forms of rumination: brooding and reflection. Brooding is the most maladaptive form of rumination, which is characterized by passive comparison of the individual's current situation to an unattainable standard, whereas the reflection form focuses more on cognitive problem-solving to reduce the effects of psychological distress<sup>18</sup>. Rumination is known to be a transdiagnostic risk factor for the development of a range of mental health problems<sup>9</sup> including eating disorders (ED). Specifically, in ED: the intrusiveness of negative repetitive thoughts associated with weight, body image, and food can lead to disordered eating behaviours (dieting, binge eating) as maladaptive coping strategies to relieve stress<sup>10</sup>. Eating disorder-specific rumination is a construct in which rumination focuses on eating behaviours, weight, and body shape concerns. It is more correlated with eating-related psychopathology, as it is more likely to be associated with negative emotions, diet restrictions and compensatory behaviours<sup>19</sup>. Although the brooding form of rumination about eating, weight and shape is particularly associated with eating-related psychopathology, primarily in healthy samples, reflection has also been associated with eating disorder symptoms, especially in clinical samples<sup>20</sup>.

Body Mass Index (BMI) is also a known factor positively correlated with eating disorders. Higher BMI values are a risk factor for the development of eating-related psychopathology by leading to restrictive dieting and subsequent rebound eating behaviour due to body dissatisfaction<sup>21</sup>.

These two constructs, perfectionism and rumination, each have a well-studied link with eating psychopathology. However, the relationship between these three concepts has not

been fully elucidated. Julie Rivière and Céline Douillie<sup>22</sup> studied the mediator role of rumination and the moderator role of gender in the relationship between perfectionism and eating-related psychopathology, and concluded that brooding significantly mediates the relationship between perfectionism and eating disorder symptoms and that gender was a significant moderator (significantly only for women).

The aim of this study was to examine the relationship between gender, perfectionism, rumination, and eating psychopathology, specifically to investigate the moderating effect of perfectionism and gender in the relationship between rumination subscales (brooding and reflection) on eating psychopathology, controlling for BMI, in a healthy adult sample.



## METHODS

### Sample

The sample consisted of 230 participants (138 women, 92 men), with a mean age of 25,58 ( $SD = 8,74$ , ranging between 18 and 69). The majority of participants were students (54,8%), 42,6% were workers and 2,6% were unemployed. Regarding marital status, 86,1% were single, 8,3% married, 3,9% in consensual union, and 1,7% divorced. Participants had a mean BMI of 22.98 kg/m<sup>2</sup> ( $SD = 3.79$ , ranging between 14,98 to 38,58) and 13.9% had psychological/psychiatric follow-up.

**Table 1** Sample characteristics

|             | Women ( $n = 138$ ) |               |                 | Men ( $n = 92$ ) |               |                 | Total ( $N = 230$ ) |               |                 |
|-------------|---------------------|---------------|-----------------|------------------|---------------|-----------------|---------------------|---------------|-----------------|
|             | Age                 | BMI           | Schooling years | Age              | BMI           | Schooling years | Age                 | BMI           | Schooling years |
| Mean        | 25,2                | 22,25         | 14,55           | 26,15            | 24,08         | 13,78           | 25,58               | 22,98         | 14,24           |
| <i>SD</i>   | 7,13                | 3,36          | 2,14            | 10,73            | 4,14          | 2,20            | 8,74                | 3,79          | 2,19            |
| Median      | 23                  | 21,56         | 15,00           | 23               | 23,03         | 13              | 23                  | 22,17         | 15,00           |
| Mode        | 23                  | 21,30         | 12,00           | 23               | 19,37         | 12              | 23                  | 21,30         | 12,00           |
| Min. – Max. | 18 – 54             | 14,98 – 36,73 | 10 – 19         | 18 - 69          | 17,92 – 38,58 | 9 – 18          | 18 - 69             | 14,98 – 38,58 | 9 – 19          |

### Procedure

This study was approved by the Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Coimbra. The sample was collected through an online survey via social media and agreed to give informed consent according to the Declaration of Helsinki. There was only one inclusion criterion, age 18 years or older, and there were no exclusion criteria.

### Measures

#### Sociodemographic data

Sociodemographic information such as gender, age, education, occupation, marital status, self-reported height and weight, and information about any psychiatric or psychological follow-up.

### Body Mass Index (BMI)

BMI measures body fat based on a person's weight and height. It is calculated by dividing body mass by the square of height and expressed in kilograms per square meter (kg/m<sup>2</sup>).

### Hewitt & Flett Multidimensional Perfectionism Scale-13 (H&F-MPS13)<sup>23</sup>

H&F-MPS13 consists of a 13 item self-report scale to measure perfectionism trait, specifically self-oriented, other-oriented, and socially prescribed perfectionism. This form is a short version of the original 45 items Hewitt & Flett Multidimensional Perfectionism Scale<sup>24</sup>. Participants respond on a 7-point scale ranging from 1 (never) to 7 (always) and it is an accurate scale validated for Portuguese samples ( $\alpha = .82$ ).

### Ruminative Response Scale for Eating Disorders (RRS-ED)<sup>25</sup>

RRS-ED was designed to estimate rumination about eating behaviours, weight and body shape. The RRS-ED consists of 9 items, 6 items for the brooding form and 3 items for the reflection form. These items' responses are on a 4-point scale, from 1 (almost never) to 4 (almost always). This scale is being validated for Portuguese samples at the Institute of Psychological Medicine of the Faculty of Medicine.

### Eating Disorder Examination Questionnaire (EDE-Q)<sup>26</sup>

The EDE-Q consists of a self-report scale with 28 items and 4 subscales: Restraint and Worries about Food, Weight, and Shape. The global EDE-Q score is calculated through the average of these subscales. It assesses eating disorder symptoms in the past 28 days and participants respond on a 7-point scale. The total score of the Portuguese version of the EDE-Q had excellent reliability ( $\alpha = .95$ )<sup>27</sup>.

## **Statistical analyses**

All data were analyzed using SPSS 28. Internal consistency of scales was calculated using Cronbach coefficients. Descriptive statistics such as central tendency and dispersion measures (standard deviation, minimum and maximum, kurtosis, and skewness) were used to define the variables in the study.

Student's t-test was used to compare the means of the variables between genders. Pearson correlation coefficient was used to calculate the correlations between variables, with values of 0.10-0.29 classified as weak, 0.30-0.49 as moderate, and 0.50-1.0 as strong (Cohen criteria<sup>28</sup>).

Four double moderation models were tested with PROCESS macro using Hayes' Model 2<sup>29</sup>. The moderators were perfectionism (socially prescribed and self-oriented) and gender to study the relationship between eating disorder specific-rumination and eating psychopathology, controlling for BMI as a covariate.

## RESULTS

### Descriptive statistics

Table 2 provides the central tendency and dispersion measures and internal consistency for the variables in study. Cronbach's alpha was near or higher than 0.70 for all variables, indicating that the scales are reliable. Other-oriented perfectionism was not used in this study due to its low internal consistency ( $\alpha = 0,61$ ).

**Table 2** Descriptive statistics and variables' internal consistency

| Variables | Mean  | SD    | Min. - Max. | Skewness | SE of Skewness | Kurtosis | SE of Kurtosis | $\alpha$ Cronbach |
|-----------|-------|-------|-------------|----------|----------------|----------|----------------|-------------------|
| RRS-ED-B  | 10,71 | 4,84  | 6 – 24      | 0,94     | 0,16           | -0,14    | 0,32           | 0,92              |
| RRS-ED-R  | 4,07  | 1,60  | 3 – 10      | 1,83     | 0,16           | 3,15     | 0,32           | 0,67              |
| EDE-Q     | 40,95 | 25,39 | 15 – 120    | 1,12     | 0,16           | 0,51     | 0,32           | 0,86              |
| MPS-SOP   | 32,26 | 10,50 | 7 – 49      | -0,58    | 0,16           | -0,53    | 0,32           | 0,90              |
| MPS-SPP   | 11,68 | 5,45  | 4 – 27      | 0,56     | 0,16           | -0,36    | 0,32           | 0,68              |

Note: SD – Standard Deviation; SE – Standard Error; RRS-ED-B – Ruminative Response Scale for Eating Disorders, Brooding Subscale; RRS-ED-R – Ruminative Response Scale for Eating Disorders, Reflection Subscale; EDE-Q – Eating Disorder Examination Questionnaire; MPS-SOP – Multidimensional Perfectionism Scale, Self-Oriented Perfectionism; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism.

### Gender Comparison

Student's t-test was used to compare mean scale scores between genders (Table 3). Women scored significantly higher than men on brooding,  $t(219,15) = -3,93$ ;  $p < 0,001$ , eating psychopathology,  $t(220,84) = -4,59$ ;  $p < 0,001$ , and BMI,  $t(158,96) = 3,16$ ;  $p = 0,002$ . There were no gender differences for reflection subscale of rumination, and both scales of perfectionism.

**Table 3** Gender comparison of mean scale scores using Student's t-test

|          | Female ( <i>n</i> = 138) |           | Male ( <i>n</i> = 92) |           | <i>t</i> | df     | <i>P</i> |
|----------|--------------------------|-----------|-----------------------|-----------|----------|--------|----------|
|          | <i>M</i>                 | <i>SD</i> | <i>M</i>              | <i>SD</i> |          |        |          |
| RRS-ED-B | 11,67                    | 5,06      | 9,28                  | 4,11      | -3,93    | 219,15 | <0,001   |
| RRS-ED-R | 4,22                     | 1,63      | 3,84                  | 1,52      | -1,78    | 228,00 | 0,077    |
| EDE-Q    | 46,72                    | 26,44     | 32,28                 | 21,05     | -4,59    | 220,84 | <0,001   |
| MPS-SOP  | 32,41                    | 11,01     | 32,02                 | 9,73      | -0,28    | 228,00 | 0,783    |
| MPS-SPP  | 11,58                    | 5,06      | 11,83                 | 6,02      | 0,34     | 228,00 | 0,738    |
| BMI      | 22,25                    | 3,36      | 23,97                 | 4,42      | 3,16     | 158,96 | 0,002    |

Note: *M* – Mean; *SD* – Standard Deviation; RRS-ED-B – Ruminative Response Scale for Eating Disorders, Brooding Subscale; RRS-ED-R – Ruminative Response Scale for Eating Disorders, Reflection Subscale; EDE-Q – Eating Disorder Examination Questionnaire; MPS-SOP – Multidimensional Perfectionism Scale, Self-Oriented Perfectionism; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism; BMI – Body Mass Index.

## Correlations

Pearson's *r* was used to calculate the correlations between the variables in study (Table 4).

Brooding ( $r = 0,84$ ) and reflection ( $r = 0,69$ ) forms of eating disorder-specific rumination were significantly and positively correlated with EDE-Q scores. Eating disorder symptoms had a stronger correlation with the brooding form. Brooding and reflection were also correlated ( $r = 0,74$ ).

Socially prescribed perfectionism had moderate positive correlations with EDE-Q scores ( $r = 0,38$ ), brooding ( $r = 0,36$ ) and reflection ( $r = 0,35$ ). It was also correlated with BMI ( $r = 0,15$ ) and self-oriented perfectionism ( $r = 0,15$ ). Self-oriented perfectionism had a significant but small association with reflection ( $r = 0,14$ ). BMI was also significantly correlated with brooding ( $r = 0,23$ ), reflection ( $r = 0,16$ ) and EDE-Q total score ( $r = 0,22$ ).

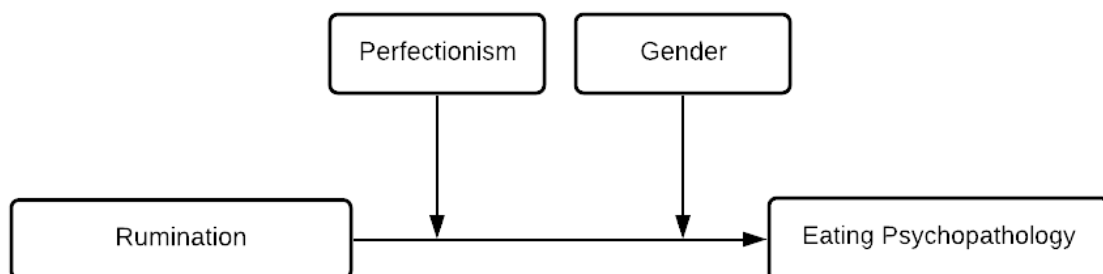
**Table 4** Variables' correlations using Pearson's *r*

|          | RRS-ED-B | RRS-ED-R | EDE-Q  | MPS-SOP | MPS-SPP |
|----------|----------|----------|--------|---------|---------|
| RRS-ED-B | -        |          |        |         |         |
| RRS-ED-R | ,74***   | -        |        |         |         |
| EDE-Q    | ,84***   | ,69***   | -      |         |         |
| MPS-SOP  | ,13      | ,14*     | 0,07   | -       |         |
| MPS-SPP  | ,36***   | ,35***   | ,38*** | 0,15*   |         |
| BMI      | 0,23***  | 0,16*    | 0,22** | -0,08   | 0,15*   |

Note: RRS-ED-B – Ruminative Response Scale for Eating Disorders, Brooding Subscale; RRS-ED-R – Ruminative Response Scale for Eating Disorders, Reflection Subscale; EDE-Q – Eating Disorder Examination Questionnaire; MPS-SOP – Multidimensional Perfectionism Scale, Self-Oriented Perfectionism; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism; BMI – Body Mass Index. \* $p < 0,05$ ; \*\* $p < 0,01$ ; \*\*\* $p < 0,001$ .

### Moderation Analyses

Four double moderation models<sup>29</sup> were used to examine the extent to which the two forms of perfectionism (self-oriented and socially prescribed) and gender impact the relationship between specific rumination about food, weight and body shape, and eating psychopathology, controlling for BMI (See Table 5). The independent variables in this study are brooding and reflection, while the dependent variable is eating psychopathology (Figure 1). The moderators were both forms of perfectionism and gender. BMI was included in these analyses as a covariate.



**Figure 1** Conceptual Model.

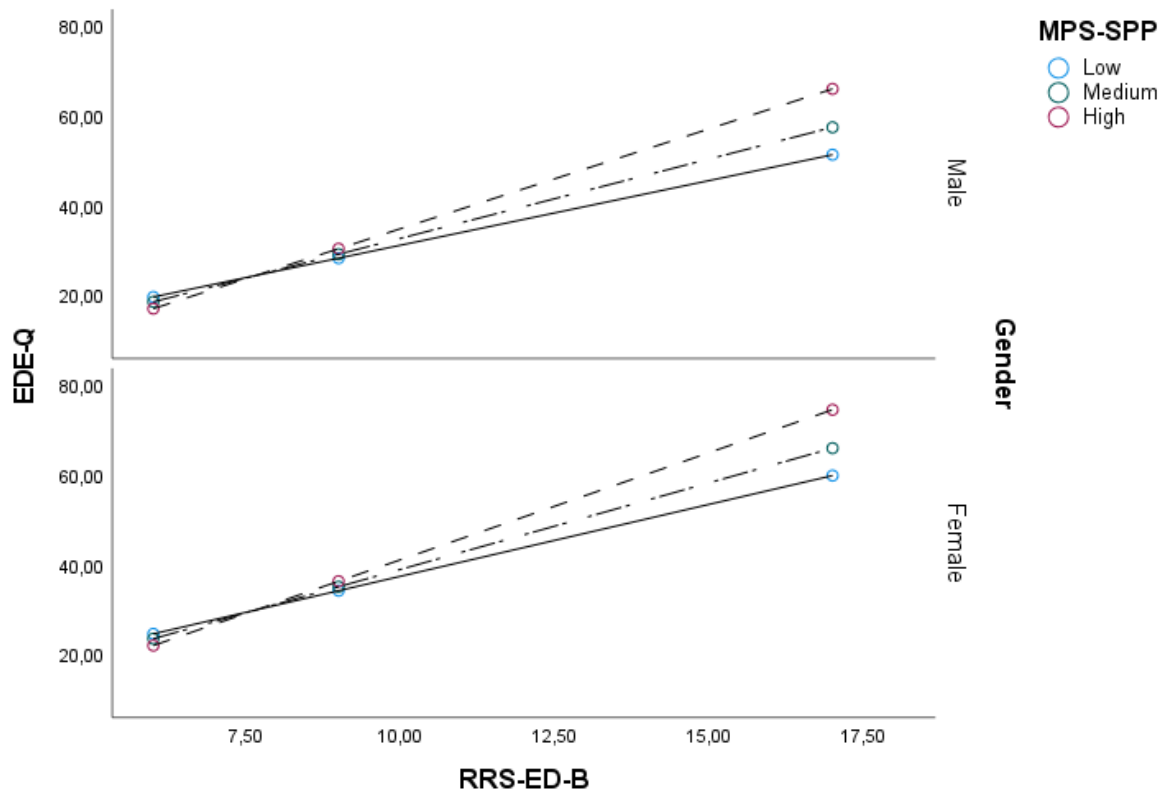
**Table 5** Four double moderation models

| <b>Model</b> | <b>Independent variable</b>    | <b>Moderator 1</b>                            | <b>Moderator 2</b> | <b>Dependent variable</b>      |
|--------------|--------------------------------|---|--------------------|--------------------------------|
| I            | Brooding rumination (RRS-ED)   | Socially Prescribed Perfectionism (H&F-MPS13) | Gender             | Eating psychopathology (EDE-Q) |
| II           | Reflection rumination (RRS-ED) | Socially Prescribed Perfectionism (H&F-MPS13) | Gender             | Eating psychopathology (EDE-Q) |
| III          | Brooding rumination (RRS-ED)   | Self-Oriented Perfectionism (H&F-MPS13)       | Gender             | Eating psychopathology (EDE-Q) |
| IV           | Reflection rumination (RRS-ED) | Self-Oriented Perfectionism (H&F-MPS13)       | Gender             | Eating psychopathology (EDE-Q) |

### Model I

In Model I, socially prescribed perfectionism and gender were the moderators, and brooding was the independent variable. The interaction between socially prescribed perfectionism and brooding was statistically significant, indicating moderation. However, gender did not affect the relationship between the dependent and independent variables (Table 5). Although gender was not a moderator, the interaction of both socially prescribed perfectionism and gender between the two variables was statistically significant ( $p < 0,001$ ). The presence of socially prescribed perfectionism and gender moderated the effect of brooding on eating disorder symptoms and explained 74,4% of the variance (Table 6).

Both low ( $B = 3,204$ ;  $p < 0,001$ ), medium ( $B = 3,858$ ;  $p < 0,001$ ), and high ( $B = 4,773$ ;  $p < 0,001$ ) levels of socially prescribed perfectionism were statistically significant for the association between brooding and eating-related psychopathology in women. The same happened in men, where also the low ( $B = 2,880$ ;  $p < 0,001$ ) and medium ( $B = 3,534$ ;  $p < 0,001$ ) levels were significant and this association became even stronger for the high levels ( $B = 4,449$ ;  $p < 0,001$ ). Individuals with lower, medium and high levels of socially prescribed perfectionism and with lower levels of brooding tend to present lower levels of eating disorder symptoms. However, individuals with higher levels of socially prescribed perfectionism and higher levels of brooding have more eating psychopathology than individuals with lower levels of socially prescribed perfectionism and higher levels of brooding. Figure 2 graphically presents the effects obtained.



**Figure 2** Model I Effects. RRS-ED-B – Ruminative Response Scale for Eating Disorders, Brooding Subscale; EDEQ – Eating Disorder Examination Questionnaire; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism.

### Model II

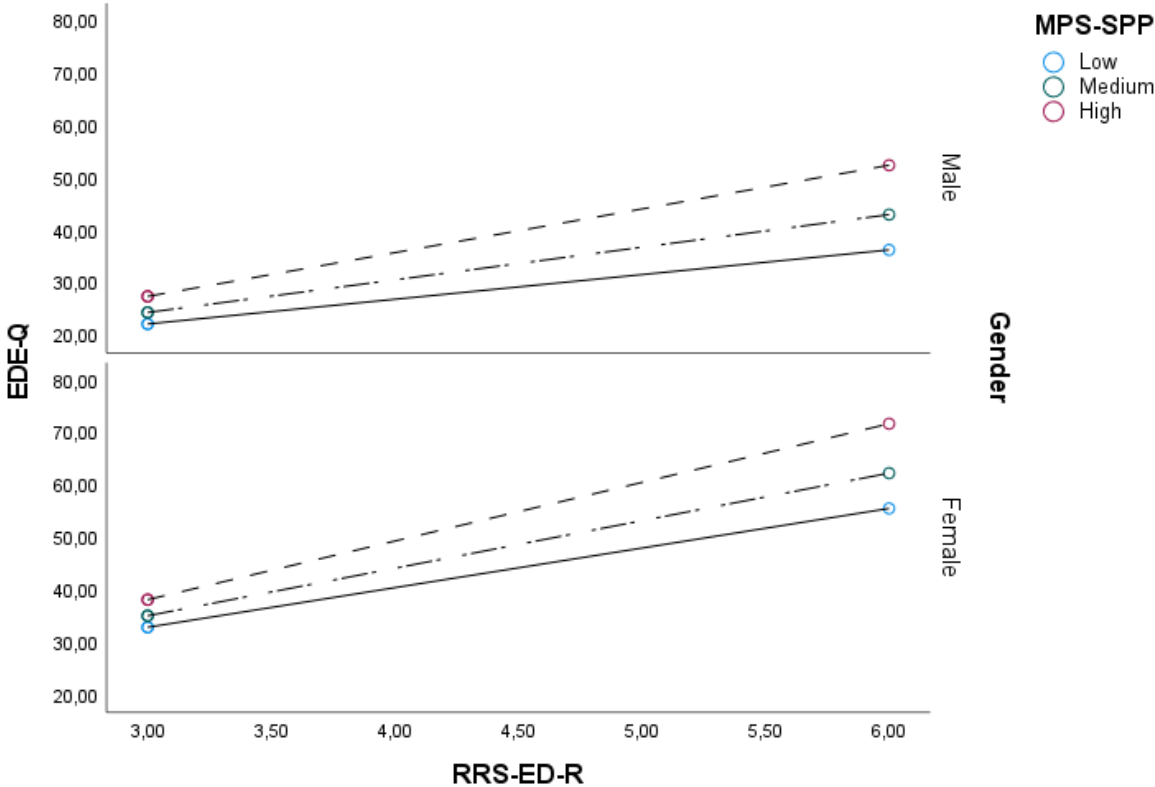
In Model II, socially prescribed perfectionism and gender were the moderators and reflection rumination was the independent variable. The interaction between reflection and socially prescribed perfectionism in eating psychopathology was statistically significant, but not the interaction between reflection and gender. However, the interaction of both socially prescribed perfectionism and gender was statistically significant ( $p < 0,05$ ) on the effect of reflection on eating psychopathology and explained 57,1% of the variance (Table 6).

For the association between reflection and eating-related psychopathology in women, low ( $B = 7,553$ ;  $p < 0,001$ ), medium ( $B = 9,065$ ;  $p < 0,001$ ), and high ( $B = 11,183$ ;  $p < 0,001$ ) values of socially prescribed perfectionism were statistically significant. Similarly, for males, both low ( $B = 4,707$ ;  $p < 0,001$ ), medium ( $B = 6,219$ ;  $p < 0,001$ ) and high values ( $B = 8,336$ ;  $p < 0,001$ ) were significant. The results are shown visually in Figure 3.

Compared with individuals with higher levels of socially prescribed perfectionism, the ones with lower levels of socially prescribed perfectionism have fewer eating disorders symptoms for the same lower levels of reflection. Similarly, individuals with higher levels of



socially prescribed perfectionism and reflection have more eating disorder symptoms than ones with lower levels of socially prescribed perfectionism and higher levels of reflection, regardless of gender. With equal levels of reflection, the extent of socially prescribed perfectionism determines the extent of eating-related psychopathology (Figure 3).



**Figure 3** Model II Effects. RRS-ED-R – Ruminative Response Scale for Eating Disorders, Reflection Subscale; EDEQ – Eating Disorder Examination Questionnaire; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism.

Model III

In Model III, self-oriented perfectionism and gender were the moderators and brooding was the independent variable. Neither self-oriented perfectionism nor gender were significant moderators of brooding’s effect on eating-related psychopathology (Table 6).

## Model IV

In Model IV, self-oriented perfectionism and gender were the moderators and reflection was the independent variable. The effect of reflection on eating psychopathology was not moderated by both self-oriented perfectionism and gender (Table 6).

**Table 6** Results from the tested models

|   | Coeff  | SE    | <i>t</i> | <i>p</i> | Bootstrapping |          |
|---|--------|-------|----------|----------|---------------|----------|
|   |        |       |          |          | Inferior      | Superior |
| <b>Model I</b> ( $R = 0,862$ ; $R^2 = 0,744$ ; $F(6,223) = 108,07$ ; $p < 0,001$ )  |        |       |          |          |               |          |
| RRS-ED-B  | 2,952  | 0,555 | 3,776    | <0,001   | 1,002         | 3,189    |
| MPS-SPP   | -1,001 | 0,392 | -2,553   | 0,011    | -1,774        | -0,229   |
| RRS-ED-B x MPS-SPP  | 0,131  | 0,032 | 4,192    | <0,001   | 0,069         | 0,192    |
| Gender  | 2,996  | 4,396 | 0,681    | 0,496    | -5,667        | 11,659   |
| RRS-ED-B x Gender   | 0,325  | 0,406 | 0,800    | 0,425    | -0,476        | 1,124    |
| BMI   | 0,277  | 0,238 | 1,163    | 0,246    | -0,192        | 0,746    |
| <b>Model II</b> ( $R = 0,756$ ; $R^2 = 0,571$ ; $F(6,223) = 49,65$ ; $p < 0,001$ )  |        |       |          |          |               |          |
| RRS-ED-R  | 2,892  | 2,439 | -1,261   | 0,237    | -1,914        | 7,698    |
| MPS-SPP   | -0,469 | 0,628 | -0,747   | 0,456    | -1,709        | 0,770    |
| RRS-ED-R x MPS-SPP  | 0,302  | 0,145 | 2,085    | 0,038    | 0,017         | 0,588    |
| Gender  | 2,179  | 6,232 | 0,350    | 0,727    | -10,102       | 14,460   |
| RRS-ED-R x Gender   | 2,846  | 1,465 | 1,943    | 0,053    | -0,041        | 5,733    |
| BMI   | 1,080  | 0,300 | 3,598    | <0,001   | 0,4890        | 1,672    |
| <b>Model III</b> ( $R = 0,846$ ; $R^2 = 0,717$ ; $F(6,223) = 93,96$ ; $p < 0,001$ ) |        |       |          |          |               |          |
| RRS-ED-B  | 3,923  | 0,759 | 5,172    | <0,001   | 2,428         | 5,418    |
| MPS-SOP   | -0,162 | 0,216 | -0,747   | 0,456    | -0,588        | 0,265    |
| RRS-ED-B x MPS-SOP  | 0,008  | 0,021 | 0,387    | 0,699    | -0,033        | 0,049    |
| Gender  | 3,947  | 4,702 | 0,893    | 0,402    | -5,320        | 13,213   |
| RRS-ED-B x Gender   | 0,083  | 0,434 | 0,190    | 0,894    | -0,772        | 0,937    |
| BMI   | 0,297  | 0,252 | 1,180    | 0,240    | -0,200        | 0,794    |
| <b>Model IV</b> ( $R = 0,736$ ; $R^2 = 0,541$ ; $F(6,223) = 43,8$ ; $p < 0,001$ )   |        |       |          |          |               |          |
| RRS-ED-R  | 8,026  | 2,911 | 2,757    | 0,082    | 2,289         | 13,763   |
| MPS-SOP   | -0,091 | 0,327 | -0,278   | 0,781    | -0,736        | 0,554    |
| RRS-ED-R x MPS-SOP  | 0,010  | 0,081 | 0,129    | 0,898    | -0,150        | 0,171    |
| Gender  | 2,273  | 6,703 | 0,339    | 0,735    | -10,936       | 15,483   |
| RRS-ED-R x Gender   | 2,582  | 1,595 | 1,619    | 0,107    | -0,561        | 5,725    |
| BMI   | 1,119  | 0,311 | 3,600    | < 0,001  | 0,507         | 1,732    |

Note: RRS-ED-B – Ruminative Response Scale for Eating Disorders, Brooding Subscale; RRS-ED-R – Ruminative Response Scale for Eating Disorders, Reflection Subscale; MPS-SPP – Multidimensional Perfectionism Scale, Socially Prescribed Perfectionism. MPS-SOP – Multidimensional Perfectionism Scale, Self-Oriented Perfectionism; BMI – Body Mass Index.

## DISCUSSION AND CONCLUSION

The purpose of this study was to investigate the moderating effect of perfectionism and gender on the relationship between rumination subscales (brooding and reflection) and eating psychopathology, controlling for BMI.

A gender comparison of scale scores showed that women had statistically higher scores for brooding and eating psychopathology, and lower body mass index than men. However, there was no significant difference between women and men for the perfectionistic forms. Existing literature indicates that women score higher than men on both brooding and reflection rumination, particularly the brooding form<sup>9</sup>. So, higher scores on eating disorder-specific brooding were expected, as general rumination is already more common in women and women have higher levels of body dissatisfaction. This dissatisfaction is closely related to the pressure to achieve the social beauty standards and the thin-ideal propagated by the media<sup>30</sup>. This could be an explanation for the recurring ruminative thoughts about eating behaviours, weight and body shape which can ultimately lead to eating psychopathology. However, in this study, the reflective form was not significantly different between women and men in the opposite of what is found in the literature concerning general rumination<sup>18</sup>. This may be because brooding correlates more strongly with eating psychopathology, particularly in women, perhaps because it distracts them from the negative emotions related to eating behaviours, weight and body image thoughts by focusing on its content, as opposed to reflection<sup>31</sup>.

Eating disorder-specific rumination had a strong and positive correlation with eating disorder symptoms, especially the brooding form. This is an expected result since repetitive thoughts can lead to food-related behaviours (dieting, binge eating) as coping strategies to relieve stress<sup>10</sup>, being strongly associated with eating disorders. Also, brooding about eating behaviours, weight, and body shape appears to increase the focus on the content of these worries rather than on the distressing emotions associated, leading to body dissatisfaction and caloric restrictive diets which explains why it is more associated with eating disordered symptoms<sup>20</sup>. Reflection is also associated with eating-related psychopathology but mostly seen in clinical samples, as in patients with anorexia nervosa. Since our sample is a non-clinical one, it was expected that brooding was more strongly associated with eating disorder symptoms than reflection<sup>20</sup>. Also, Rivière and Douillie<sup>22</sup> found that brooding significantly mediated the relationship between perfectionism and eating disorder symptoms, suggesting that perfectionism may lead to rumination, which in turn may lead to eating disorders. They also found that gender can affect the relationship between perfectionism and eating disorder symptoms.

The moderation analyses suggested that socially prescribed perfectionism was a moderator between the relationship of rumination (both brooding and reflection form) and eating psychopathology. However, the same did not happen with self-oriented perfectionism, which did not affect the link between rumination and eating-related psychopathology. This raises an important question about why socially prescribed perfectionism influences the outcome, but not self-oriented perfectionism. Literature indicates that socially prescribed perfectionism is the main form of perfectionism associated with eating disorders due to the person's feeling of pressure to be perfect, believing that is what is expected from others. This need to achieve perfection to correspond to society's norms may lead to a concern about body image and actions to reduce body weight such as very restrictive dieting or excessive physical training<sup>14,15</sup>. Self-oriented perfectionism is also associated with eating-related psychopathology<sup>8</sup>. However, it depends on whether they rely on their body image to succeed in their objectives. When body dissatisfaction is present, their need to achieve a perfect physical appearance may lead to anxiety and restrictive dieting or compensatory eating behaviours<sup>32</sup>. The moderation effect was higher for brooding, as expected, because it is the most maladaptive form of rumination and the most common in eating disorders symptoms in healthy samples<sup>18</sup>.

Gender did not moderate the relationship between rumination and eating psychopathology, which indicates that the pattern of interaction of perfectionism with rumination on eating psychopathology is similar in both genders. Thus, higher levels of socially prescribed perfectionism associated with higher levels of brooding lead to higher levels of eating psychopathology, regardless of gender.

The present study has some limitations. One is that the information was obtained exclusively by self-report, which may lead to inaccurate reports. Another limitation is that the sample was predominantly female (60%). Also, since this is a cross-sectional design, causal inferences are not possible. The scales used did not consider muscle-oriented body image and related behaviours, which would be important for studying eating disorder symptoms and thoughts about body dissatisfaction, particularly in men.

In conclusion, the findings of our study are important for eating disorder prevention and treatment because working on socially prescribed perfectionistic traits in patients with high levels of rumination may prevent the development of eating psychopathology. Further studies in clinical samples are important to investigate whether a similar pattern occurs.

## **AGRADECIMENTOS**

Agradeço à Dra. Cristiana Marques por toda a disponibilidade, amabilidade e apoio ao longo deste percurso, dando-me a oportunidade de trabalhar num tema que me é tão querido.

Agradeço ao Prof. Dr. António Macedo pela sua importante orientação e supervisão neste projeto.

Um obrigado à minha família que amparou sempre, por toda a preocupação, paciência e amor.

Um obrigado aos meus amigos que foram incansáveis na divulgação do projeto, por terem sempre uma palavra carinhosa a dar-me e por me fazerem sentir que nunca estou sozinha.

Por fim, agradeço a todos os participantes deste estudo, foram essenciais para a sua concretização.

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