



Effects of induced rumination on body dissatisfaction: Is there any difference between men and women? ☆



Julie Rivière*, Amélie Rousseau, Céline Douilliez*

Univ. Lille, EA 4072 - PSITEC - Psychologie: Interactions Temps Émotions Cognition, F-59000 Lille, France

ARTICLE INFO

Keywords:

Induced rumination
Body dissatisfaction
Gender

ABSTRACT

Background and objectives: Rumination is a factor in the development and maintenance of body dissatisfaction. However, no study has yet investigated the impact of the type of rumination on body image. The first aim of this study was to examine whether the induction of analytic-abstract vs. concrete-experiential rumination affects body dissatisfaction following an induction of negative body image. The second objective was to examine gender differences in these effects.

Methods: Following induction of negative body image, 102 university undergraduates were randomly assigned to one of three experimental conditions—distraction, concrete rumination or abstract rumination.

Results: As expected, there were significant main effects of gender and condition, and a significant interaction between gender and condition on change in body dissatisfaction. In women abstract rumination predicted the highest increase in body dissatisfaction, whereas concrete rumination predicted the highest increase in body dissatisfaction in men.

Limitations: Given that our sample consisted of undergraduate students, our findings cannot be generalized to clinical sample suffering from eating disorder.

Conclusions: The different types of rumination seem to impact differentially body dissatisfaction in men and women.

Negative body image is a common personal concern that is influenced by pressure from the media, peers, and family (Heinberg, 1996). Concerns about body image may lead to body dissatisfaction, defined as the difference between the perceived and the desired body (Cash, 2002). In the literature, higher body dissatisfaction in women than in men is frequently observed (Dany & Morin, 2010; Furnham & Calnan, 1998). Women report more concerns about their weight and shape than men (Buchanan, Bluestein, Nappa, DePatie, & Woods, 2013).

Body dissatisfaction can be considered a major risk factor for eating disorders (Stice & Shaw, 2002; Stice, 2002) as well as numerous other psychopathological disorders such as depression (Franko & Striegel-Moore, 2002), social physical anxiety (Russell & Cox, 2003), or body dysmorphic disorder (Sarwer, Wadden, Pertschuk, & Whitaker, 1998).

There are several evidence-based interventions which target body dissatisfaction by focusing on the symptoms of eating disorders (see Watson et al., 2016 for a review). However, a recent systematic review and meta-analysis on the prevention of eating disorders highlighted

small to moderate effect sizes for the reduction of ED risk factors or symptoms (Le, Barendregt, Hay, & Mihalopoulos, 2017), which suggest considerable scope for improvement. As Watson and collaborators (2016) concluded, a better understanding of the causal risk factors involved in eating disorders is lacking. They suggested that a path to improving the efficiency of interventions may lie in the adaptation of transdiagnostic programs. Such programs have shown efficacy for a variety of disorders such as anxiety and depression. Identifying transdiagnostic processes involved in body dissatisfaction seem important for preventing and treating eating disorders.

A promising line of research has identified rumination as a potential factor in the development and maintenance of body dissatisfaction (e.g., Etu & Gray, 2010; Holm-Denoma & Hankin, 2010).¹ Rumination is a mental process characterized by repetitive, prolonged, and recurrent thinking about one's concerns and one's experiences (Watkins, 2008). It may be that rumination is triggered by the perception of a discrepancy between the current state and an ideal state (Martin &

☆ The writing of this article was facilitated by a grant from the "Agence Nationale de la Recherche" (ANR-13-JSH2-0003-01).

* Corresponding authors. Université Charles de Gaulle – Lille 3, UFR de Psychologie, Laboratoire PSITEC, Domaine universitaire Pont du Bois, BP 60149 - 59 650, Villeneuve d'Ascq, France.

E-mail addresses: julie.riviere@univ-lille3.fr (J. Rivière), celine.douilliez@univ-lille3.fr (C. Douilliez).

¹ The term "rumination" has been chosen because it is the one that is widely used in the literature on eating disorder and body dissatisfaction (Crowdrey & Park, 2012; Dondzilo, Rieger, Palermo, Byrne, & Bell, 2017; Rivière & Douilliez, 2017; Svaldi & Naumann, 2014). However, the construct belongs to the more general category of negative repetitive thoughts.

Table 1
Means and SD for the pre-manipulation measures separated by condition and gender.

Measure	Distraction group N = 34		Experiential rumination group N = 34		Analytical rumination group N = 34		F	Female N = 51		Male N = 51		t
	M	SD	M	SD	M	SD		M	SD	M	SD	
Age	21.35	.28	21.53	.29	22.15	.25	2.30	21.82	1.60	21.53	1.65	.91
BMI	22.18	.45	21.51	.34	22.96	.60	2.34	21.49	3.02	22.95	2.39	−2.71**
CDRS	1.47	.19	.91	.15	1.17	.16	2.79	1.35	.89	1.02	1.07	1.71
PANAS	16.38	1.00	14.77	.81	15.29	.77	.90	15.43	5.37	15.53	4.78	−.09
Brooding	8.41	.52	9.00	.38	10.79	.59	6.07**	9.61	3.48	9.20	2.64	.67
BES	63.06	1.57	67.18	2.04	66.71	1.71	1.59	64.26	11.63	67.04	9.08	−1.35
EAT	6.56	1.27	5.06	.92	9.19	1.11	3.44*	7.57	8.51	6.26	3.87	1.00
CESD	17.94	1.50	14.53	1.23	14.88	1.13	2.09	17.28	8.52	14.29	6.40	1.99*

Note: $n = 102$, * $p < .05$; ** $p < .01$ BMI = Body Mass Index; CDRS = Contour Drawing Rating Scale; PANAS = Positive and Negative Affect Schedule; BES = Body Esteem Scale; EAT = Eating Attitude Test; CESD = The Center for Epidemiologic Studies Depression Scale Revised.

Tesser, 1996). Given that body dissatisfaction is the result of a negative comparison between the actual body image and the ideal body image, one might predict that body dissatisfaction triggers rumination, which in turn maintains body dissatisfaction. The first studies on rumination focused on its role in depression (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007), but rumination is now studied as a transdiagnostic process involved in the development, the maintenance and the recurrence of many disorders (Baeyens, Kornacka, & Douilliez, 2012; Ehring & Watkins, 2008; Nolen-Hoeksema & Watkins, 2011). Recently, studies have shown that rumination is positively related to body dissatisfaction in females (Etu & Gray, 2010; Holm-Denoma & Hankin, 2010; Maraldo, Zhou, Dowling, & Vander Wal, 2016). Whereas the vast majority of eating disorders studies are conducted on a female population, gaining a better understanding of eating disorders in men is necessary. However, the study of men requires the validation of eating disorder symptoms scales on male populations, the investigation of which psychological processes are involved in eating disorder symptoms experienced by men, and whether they play the same role as the ones identified in women (Gordon, Holm-Denoma, Troop-Gordon, & Sand, 2012; Opwis, Schmidt, Martin, & Salewski, 2017; Rivière & Douilliez, 2017). Some authors concluded that cognitive factors may play an important role in explaining gender differences in eating disorders (Opwis, Schmidt, Martin, & Salewski, 2017). It has been found that women ruminate more than men (Johnson & Whisman, 2013), and that women report more body dissatisfaction than men (Furnham, Badmin, & Sneade, 2002; Griffiths et al., 2017). However, it might be interesting to explore not only a difference in the propensity to use the strategy but also in the way of ruminating, given that it is a core feature determining whether rumination is constructive or not.

Although most studies are correlational, it has also been shown, in a female sample, that participants reported higher body dissatisfaction after an experimental induction of rumination compared to an induction of distraction (Etu & Gray, 2010), or compared to an induction of acceptance (Svaldi & Naumann, 2014; Wade, George, & Atkinson, 2009). To our knowledge, no study had examined the effect of induced rumination in males.

Recently, Cowdrey and Park (2011) have developed the Ruminative Response Scale-Eating Disorders (RRS-ED) to assess the tendency to specifically ruminate about diet, weight, and shape. Their results indicate that rumination focused on concerns related to the body is a better predictor of eating disorders' symptoms than is depressive rumination (Cowdrey & Park, 2011). However, to our knowledge, no study has focused on the relationship between rumination related to eating disorders and body dissatisfaction.

Besides the content of rumination (e.g., depressive, anxious or body-related), it has been shown that the mode of processing the information might play a central role in the consequences of rumination (Watkins, 2008). One may distinguish two main forms of rumination: abstract-analytic and concrete-experiential (Watkins, 2008). Analytic-abstract

rumination is unconstructive, consisting in abstract and evaluative thinking about the causes and consequences of one's mood or condition, characterized by asking "why" the mood or associated events happened and analysing their meanings for the self. By contrast, concrete-experiential rumination is constructive, being characterized by a mode focused on "contextual and incidental details of events and actions, inferences of situations-specific state or representations of the specific "how" details of an action and of the means to an end" (Watkins, Moberly, & Moulds, 2008, p. 365). It has been shown that rumination induction increased self-reported negative affects and body dissatisfaction (Etu & Gray, 2010; McLaughlin, Borkovec, & Sibrava, 2007). More specifically, in comparison with the induction of concrete-experiential rumination, the induction of analytic-abstract rumination is associated with more negative symptoms (for a review, see Watkins, 2008) and an increase in stress-induced cognitive reactivity in individuals with eating disorder symptoms (Rawal, Williams, & Park, 2011).

Given these findings, the aim of the present study was to determine the effects of different modes of body-related rumination on body dissatisfaction and negative affect. We hypothesized that, following a task intended to induce negative body image, participants in the abstract-analytic condition would report a higher increase of body dissatisfaction and negative affect compared to two other conditions (concrete-experiential rumination or distraction). A secondary objective was to examine whether the participant's gender would moderate this effect. Given the reported gender differences in rumination and body dissatisfaction, we hypothesized that the effect of the condition on body dissatisfaction would be stronger in women than in men.

1. Method

1.1. Participants

The participants were 102 university undergraduates (50% female) recruited via social networks and email. Their mean age was 21.68 years ($SD = 1.62$). Based on self-reported height and weight, their mean Body Mass Index (BMI) was 22.22 ($SD = 2.81$). The mean age and mean BMI are reported separately for men and women in the Table 1. None of our participants scored higher than 20 on the EAT (the cut-off indicating a high level of concern about dieting, body weight or problematic behaviours; Garner, Olmsted, Bohr, & Garfinkel, 1982).

1.2. Measures

Contour Drawing Rating Scale (CDRS; Thompson & Gray, 1995). This scale measures body image and consists of 9 figures (silhouettes) on a continuum. In the female version, Fig. 1 is considered extremely thin and Figure 9 extremely large, while for males Fig. 1 is considered extremely thin and Figure 9 is considered extremely muscular.

Participants first choose the image that represents as closely as possible their current figure and then they select the image that represents as closely as possible their ideal figure. The body dissatisfaction score is calculated as the difference between the responses for the current and ideal figures: the higher the score, the higher the body dissatisfaction.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; French version: Gaudreau, Sanchez, & Blondin, 2006). We used the 10 items in the “Negative Affect” subscale. Each item is an adjective describing feelings and emotions. Participants choose the number that best matches their feelings at the present time, from 1 (*very little or not at all*) to 5 (*extremely*). In the present study we found good internal consistency at time 1 (Cronbach's $\alpha = 0.84$) and at time 2 (Cronbach's $\alpha = 0.79$).

Ruminative Response Scale for Eating Disorders (RRS-ED; Cowdrey & Park, 2011; French validation: Douilliez, Rivière, & Rousseau, 2016). This scale assesses the individual's mental ruminations concerning food, figure and weight. This questionnaire includes 9 items, and participants choose the number that best matches the frequency of their thoughts between 1 (*almost never*) and 4 (*almost always*). In the present study we found good internal consistency (Cronbach's $\alpha = 0.84$) for the subscale “brooding”. The subscale “reflection” was not used in the present study due to its low internal consistency (Cronbach's $\alpha = 0.58$).

Body Esteem Scale (BES; Mendelson, Mendelson, & White, 2001; French version: Valls, Rousseau, & Chabrol, 2011; Rousseau, Valls, & Chabrol, 2015). This multi-dimensional survey assesses attitudes and feelings about body and appearance. It consists of 23 items to be rated on a Likert-type scale ranging from 1 (*never*) to 5 (*always*), with higher scores indicating higher body esteem. In the present study the scale showed good internal consistency (Cronbach's $\alpha = 0.82$).

The Center for Epidemiologic Studies Depression Scale Revised (CESD-R, Eaton, Muntaner, Smith, Tien, & Ybarra, 2004, French Version: Bouvard, Denis, & Roulin, 2013). This 20-item questionnaire measures the level of depression. Participants have to answer each item on a Likert-type scale from 0 (*never*) to 6 (*all the time*). The questionnaire showed good internal consistency (Cronbach's $\alpha = 0.82$) in the present study.

Eating Attitudes Test (EAT; Garner & Garfinkel, 1979, French version: Leichner, Steiger, Puentes-Neuman, & Perreault, 1994). This 26-item questionnaire measures symptoms and concerns characteristic of eating disorders. Participants rate each item on a Likert-type scale ranging from 1 (*never*) to 6 (*always*). The present study this scale showed good internal consistency (Cronbach's $\alpha = 0.83$).

1.3. Procedure

The research was approved by the local Ethics Committee for Human Sciences. After signing a letter of information and a consent form, participants completed the following questionnaires: the PANAS, RRS-ED, the CESD-R, the CDRS, the BES, and the EAT. They then completed a task that was intended to induce negative body image. Like Wade et al. (2009), we presented a series of 10 photographs of models (men for men, women for women). To increase the impact of the induction, participants received instructions to compare themselves to models by completing an adaptation of the Consumer Response Questionnaire (Mills, Polivy, Herman, & Tiggermann, 2002) for each of the photographs. Participants had to indicate their level of agreement, on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with the following three statements: (1) “I wish that my body looked like that of this man/woman”; (2) “This woman is thinner than me/this man is more muscular than me”; (3) “In a clothing store, I would not try on a swimsuit in the same room as this man/woman if he/she was also trying on a swimsuit”.

Participants were then assigned randomly to one of three conditions adapted from Watkins and Teasdale's (2004) procedure: an abstract-analytic rumination condition, a concrete-experiential rumination condition, or a distraction condition. For the abstract-analytical

condition, participants received the following instruction: “Now you will focus on the following cues and try to analyse the causes and consequences” while for the concrete-experiential condition, participants received the instruction: “Now you will focus on your experience, how you feel inside, on your feelings and physical sensations related to the following cues”. A list of 5 cues, the same for both rumination conditions, was then presented (i.e., my current weight, my waist size, my body tonicity, my body shape, my musculature). For the distraction condition, participants received this instruction: “Now you will focus on specific images.” The list also included 5 cues (i.e., the form of a large black umbrella, the movement of a windmill, raindrops running down a window, the shape of the African continent, a train which stops at the station). To monitor compliance with the instructions, participants were then invited to indicate, on a scale of 0 (*not at all*) to 10 (*entirely*) if (1) “I tried to follow instructions”; (2) “I managed to follow instructions” (see Svaldi & Naumann, 2014). After this, participants completed the PANAS and CDRS again, and supplied socio-demographic information. Finally, every participant received an induction of positive body image, with a humorous video advocating body diversity. Participants were invited to discuss with the experimenter the notion of body acceptance.

2. Results

2.1. Preliminary analyses

Following the recommendations of Tabachnick and Fidell (2007), we tested for univariate and multivariate outliers. There were none. Thus, we conducted our analyses on the data from all 102 participants. Data were analysed using SPSS 20.

The descriptive statistics (means and standard deviations) for all the pre-induction measures are reported in the Table 1 according to condition and gender. Analyses of variance (ANOVA) were used to compare demographic characteristics and pre-induction measures among groups, and Student's *t*-tests among genders (see Table 1). There were no differences between conditions for age, baseline CDRS scores, baseline PANAS scores, and BES score. There was a difference between men and women on BMI and CESD, and a difference between conditions on brooding and EAT. Therefore, BMI, CESD, brooding and EAT scores should be controlled for in the following analyses.

2.2. Manipulation check

We conducted a condition (distraction vs. concrete-experiential rumination vs. analytic-abstract rumination) \times gender (men vs women) factorial ANOVA on both instruction-compliance scales. Neither main effect nor the interaction were significant (all *F*s < 1).

2.3. Overview of data-analysis strategy

In order to test the effect of conditions on body dissatisfaction and negative affectivity, we computed two separate dependent variables: an index of negative affectivity change and an index of body dissatisfaction change. Each of these variables was computed by regressing the post-induction score (PANAS for negative affectivity and CDRS for body dissatisfaction) on baseline score. Residual scores from this regression reflect changes due to experimental manipulation (Hunt, 1998). The data were analysed with two separate analyses of covariance (ANCOVA) with condition and gender as between-subjects. Following the recommendations of Miller and Chapman (2001), given ANCOVA is not an analysis designed to control for naturally occurring group differences, we conducted our analyses without controlling for BMI, CESD, brooding and EAT.²

² However, following the recommendations of Field (2013) about control variables, we

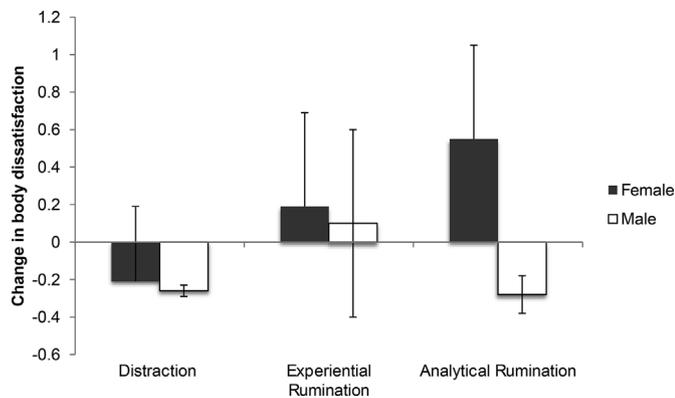


Fig. 1. Mean change (with standard errors) in body dissatisfaction by condition and gender.

2.4. Effects of experimental manipulation and gender on body dissatisfaction

We observed a significant main effect of gender, $F(1,91) = 18.71$, $p < .001$, $\eta^2 = 0.16$: women reported a larger change in body dissatisfaction than men (respectively $M = .49$; $SD = 0.54$ and $M = 0.10$; $SD = 0.36$). As expected, we also observed a significant main effect of condition, $F(2,91) = 8.27$, $p < .001$, $\eta^2 = 0.15$: there was a larger change in body dissatisfaction in the analytic-abstract condition ($M = 0.14$; $SD = 0.56$) than in either the concrete-experiential condition ($M = 0.10$; $SD = 0.55$) or the distraction condition ($M = -0.23$; $SD = 0.30$). In addition, we observed a significant interaction between condition and gender, $F(2,91) = 8.56$, $p < .001$, $\eta^2 = 0.15$ (see Fig. 1).

To explore this interaction, we ran separate ANOVAs for men and women. In women, there was a significant main effect of condition, $F(1,43) = 10.48$, $p < .01$, $\eta^2 = 0.30$. Women reported a larger increase in body dissatisfaction in the abstract condition, $t(32) = 4.69$, $p < .001$, and the concrete condition, $t(32) = 2.52$, $p < .05$, than in the distraction condition. Women also reported a larger increase in body dissatisfaction in the analytic-abstract condition than in the concrete-experiential condition, $t(32) = 2.05$, $p < .05$.

Interestingly, in men, there was also a significant main effect of condition, $F(1,43) = 4.03$, $p < .05$, $\eta^2 = 0.14$, but in an unexpected direction. Men reported a larger increase in body dissatisfaction in the concrete condition compared to the distraction condition, $t(32) = 2.12$, $p < .05$, and a marginally significant larger increase in the concrete than the abstract condition, $t(32) = 2.08$, $p = .05$.

2.5. Effects of experimental condition and gender on changes in negative affect

As expected, the ANOVA revealed a significant main effect of condition, $F(2,91) = 4.99$, $p < .01$, $\eta^2 = 0.09$. Participants reported a larger increase in negative affect in the analytic-abstract condition than in the distraction condition, $t(66) = 3.48$, $p < .001$. We observed a significant main effect of gender, $F(1,91) = 4.50$, $p < .01$, $\eta^2 = 0.05$. However, the condition \times gender interaction was significant, $F(2,91) = 1.89$, *n.s.*

3. Discussion

In this study, the finding that induced rumination predicts an increase in body dissatisfaction (Etu & Gray, 2010) compared to a control (distraction) condition was replicated. However, Etu and Gray's study

(footnote continued)

also conducted our analyses controlling for the effects of these four variables (i.e., BMI, CESD, brooding and EAT) and we obtained the same results.

was conducted with women only and with the sole comparison of rumination with distraction, without taking into account the type of rumination (i.e., abstract-analytic vs. concrete-experiential). Their rumination condition was similar to our abstract analytical condition. In the current study, in line with our primary hypothesis, the induction of abstract rumination predicted a greater increase in body dissatisfaction compared to the distraction condition. However, the pattern of results was different for men and women. For women in both rumination conditions, compared with the distraction condition, there were greater increases in body dissatisfaction, which is consistent with Etu and Gray's (2010) results. Similarly to the Rawal et al. (2011) results, our female participants reported greater increases in body dissatisfaction in the analytic-abstract condition than in the concrete-experiential one. By contrast, in men, the most detrimental condition for body dissatisfaction was the concrete-experiential rumination. This unexpected result needs to be replicated and further explored, but suggests that there might be different processes involved in the onset and maintenance of body dissatisfaction in men and women. This hypothesis is congruent with the literature that points to a gender difference in the use of rumination strategies (Johnson & Whisman, 2013; Nolen-Hoeksema, 1987; Tamres, Janicki, & Helgeson, 2002), and with the idea that cognitive factors may play an important role in explaining gender differences in eating disorders (Opwis et al., 2017). In fact, it has been highlighted that there are relationships between gender, rumination, and eating disorder symptoms (Opwis et al., 2017), but to our knowledge, this is the first study to compare men and women on the effect of the type of rumination (i.e., abstract-analytic vs. concrete-experiential) on body dissatisfaction.

One way to understand this difference is to look at the body dissatisfaction differences between men and women. It has been found that when shown images of a variety of people of the same gender, women with high levels of body dissatisfaction were more likely to focus their attention on images of thin bodies, while men with high levels of body dissatisfaction were more likely to focus their attention on images of muscular bodies (Cho & Lee, 2013). Given that men's and women's body dissatisfaction is directed toward different aspects of the body (Valls, Callahan, Rousseau, & Chabrol, 2014), we can hypothesize that the behaviours aimed at reducing the gap between one's actual body and the body one would like to have may be different in men and women. Thus, in order to reduce their body dissatisfaction, men tend to engage in behavioural activation, by doing sports and to using muscle enhancing substances such as steroids or ephedrine (Cafri et al., 2005). In contrast, to achieve the same goal, women engage in behavioural inhibition as they are more likely to control their food consumption. We might hypothesize that these differences in behavioural trends between men and women could lead to different ways of ruminating after a body dissatisfaction induction. Indeed, some research suggested that self-focused rumination is related to behavioural inhibition (e.g., Keune, Bostanov, Kotchoubey, & Hautzinger, 2012). However, when looking at negative affect in both genders, our results showed that both of the rumination conditions are more detrimental than the distraction condition, and that the two rumination conditions did not differ in their effects on negative affect, which is consistent with the literature in non-depressed people (Rawal et al., 2011).

3.1. Clinical implications

Our study has important clinical implications. First, it expands the literature regarding the importance of addressing rumination in people who report body dissatisfaction. In fact, there are two validated programs focused on rumination (Watkins et al., 2011; Young & Dietrich, 2014). These therapies have proven effective in dealing with depression, the aim being to identify the unconstructive (i.e., abstract-analytic) ruminations, and helping people switch to a more concrete experiential style. Providing replication in clinical populations, the present study offers new perspectives for body dissatisfaction treatment

and prevention by suggesting implementation of a rumination-focused module. However, according to our results, it seems that the abstract-analytical rumination is the most detrimental mode only in women, which raises some questions. Given that the concrete mode seems to be the most detrimental for men, it is questionable whether concreteness training would be useful to them, or if it might even be harmful. Thus, these results highlighted the value of providing gender-specific treatment interventions for body dissatisfaction.

3.2. Limitations and future directions

Our participants were university undergraduates, so the question remains open as to whether our findings will generalize to community samples. Although none of our participants scored higher than 20, we cannot rule out that some of our participants were suffering from eating disorders. Moreover, the male body dissatisfaction induction may not have been powerful enough to elaborate differences between the types of rumination in males. Future research should also compare our findings to what might be found in clinical populations, and determine whether rumination focused therapy (Watkins et al., 2011), as an added module to existing evidence-based treatment and prevention programs for eating disorders (Watson et al., 2016), can further reduce body dissatisfaction. Furthermore, future studies should include a measure of state rumination as a manipulation check for the rumination induction.

4. Conclusions

This study has implications for research and for clinical practice. In terms of implications for research, this study adds to the literature regarding the relations between rumination and body dissatisfaction. In addition, it uses an experimental methodology, as opposed to the correlational approach used in most of the studies in this field. This study also shows that the relationship between rumination and body dissatisfaction is dependent on gender, and the possibility that the processes involved in rumination and body dissatisfaction differ by gender. With regards to clinical implications, this study confirms the results of previous studies suggesting the role of rumination in body dissatisfaction and more generally eating disorder symptoms (Etu & Gray, 2010; Svaldi & Naumann, 2014). It also suggests that an appropriate therapy might differ for men and women. Finally, these results open perspectives for future research on gender differences in the psychological processes involved in body dissatisfaction.

Conflicts of interest

There is no interest to be declared.

Acknowledgments

The authors thank Léa Leblond and Honorine Leclercq for their help in collecting the data and Eric Gebhardt for his helpful comments on a previous version of this paper.

References

Baeyens, C., Kornacka, M., & Douilliez, C. (2012). De la dépression à une perspective transdiagnostique: Conceptualisation et interventions sur les ruminations mentales. *Revue francophone de clinique comportementale et cognitive*, 17, 66–85.

Bouvard, M., Denis, A., & Roulin, J. L. (2013). Confirmation des dimensions de la version française de l'Échelle d'auto évaluation Center for Epidemiological Studies Depression (CESD). *Encephale*, 39, 452–453. <https://doi.org/10.1016/j.encep.2012.01.006>.

Buchanan, N. T., Bluestein, B. M., Nappa, A. C., Woods, K. C., & DePatie, M. M. (2013). Exploring gender differences in body image, eating pathology, and sexual harassment. *Body Image*, 10(3), 352–360. <https://doi.org/10.1016/j.bodyim.2013.03.004>.

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review*, 25(2), 215–239. <https://doi.org/10.1016/j.cpr.2004.09.003>.

Cash, T. F. (2002). The situational inventory of body-image dysphoria: Psychometric evidence and development of a short form. *International Journal of Eating Disorders*, 32(3), 362–366. <https://doi.org/10.1002/eat.10100>.

Cho, A., & Lee, J. H. (2013). Body dissatisfaction levels and gender differences in attentional biases toward idealized bodies. *Body Image*, 10(1), 95–102. <https://doi.org/10.1016/j.bodyim.2012.09.005>.

Cowdrey, F. A., & Park, R. J. (2011). Assessing rumination in eating disorders: Principal component analysis of a minimally modified ruminative response scale. *Eating Behaviors*, 12, 321–324. <https://doi.org/10.1016/j.eatbeh.2011.08.001>.

Cowdrey, F. A., & Park, R. J. (2012). The role of experiential avoidance, rumination and mindfulness in eating disorders. *Eating Behaviors*, 13(2), 100–105.

Dany, L., & Morin, M. (2010). Image corporelle et estime de soi: Étude auprès de lycéens français. *Bulletin de Psychologie*, 59(5), 321–334. <https://doi.org/10.3917/bupsy.509.0321>.

Dondzilo, L., Rieger, E., Palermo, R., Byrne, S., & Bell, J. (2017). The mediating role of rumination in the relation between attentional bias towards thin female bodies and eating disorder symptomatology. *PLoS One*, 12(5), e0177870.

Douilliez, C., Rivière, J., & Rousseau, A. (2016). Rumination related to weight, shape and eating: French validation of ruminative response scale for eating disorders. *Poster presentation at the 8th world congress of behavioural and cognitive therapies June 2016, Melbourne (Australia)*.

Eaton, W. W., Muntaner, C., Smith, C., Tien, A., & Ybarra, M. (2004). Center for epidemiologic studies depression Scale: Review and revision (CESD and CESD-R). In M. E. Maruish ME (Ed.). *The use of psychological testing for treatment planning and outcomes assessment*(3rd ed.). Mahwah, NJ: Lawrence Erlbaum <https://doi.org/10.4324/9781410610638>.

Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, 1, 192–205. <https://doi.org/10.1521/ijct.2008.1.3.192>.

Etu, S. F., & Gray, J. J. (2010). A preliminary investigation of the relationship between induced rumination and state body image dissatisfaction and anxiety. *Body Image*, 7(1), 8285. <https://doi.org/10.1016/j.bodyim.2009.09.004>.

Franko, D. L., & Striegel-Moore, R. H. (2002). The role of body dissatisfaction as a risk factor for depression in adolescent girls: Are the differences black and white? *Journal of Psychosomatic Research*, 53(5), 975–983. [https://doi.org/10.1016/S0022-3999\(02\)00490-7](https://doi.org/10.1016/S0022-3999(02)00490-7).

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *Journal of Psychology*, 136(6), 581–596. <https://doi.org/10.1080/00223980209604820>.

Furnham, A., & Calnan, A. (1998). Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. *European Eating Disorders Review*, 6(1), 58–72. [https://doi.org/10.1002/\(sici\)1099-0968\(199803\)6:1%3c58::aid-erv184%3e3.0.co;2-v](https://doi.org/10.1002/(sici)1099-0968(199803)6:1%3c58::aid-erv184%3e3.0.co;2-v).

Garner, D. M., & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9(02), 273–279. <https://doi.org/10.1017/s0033291700030762>.

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine*, 12(4), 871–878. <https://doi.org/10.1017/S0033291700049163>.

Gaudreau, P., Sanchez, X., & Blondin, J. (2006). Positive and negative affective states in a performance-related setting testing the factorial structure of the PANAS across two samples of French-Canadian participants. *European Journal of Psychological Assessment*, 22, 240–249. <https://doi.org/10.1027/1015-5759.22.4.240>.

Gordon, K. H., Holm-Denoma, J. M., Troop-Gordon, W., & Sand, E. (2012). Rumination and body dissatisfaction interact to predict concurrent binge eating. *Body Image*, 9(3), 352–357. <https://doi.org/10.1016/j.bodyim.2012.04.001>.

Griffiths, S., Murray, S. B., Bentley, C., Gratwick-Sarll, K., Harrison, C., & Mond, J. M. (2017). Sex differences in quality of life impairment associated with body dissatisfaction in adolescents. *Journal of Adolescent Health*, 61(1), 77–82. <https://doi.org/10.1016/j.jadohealth.2017.01.016>.

Heinberg, L. J. (1996). Theories of body image disturbance: Perceptual developmental, and sociocultural factors. In J. K. Thompson (Ed.). *Body image, eating disorders, and obesity: An integrative guide for assessment and treatment* Washington, DC: American Psychological Association <https://doi.org/10.1037/10502-002>.

Holm-Denoma, J. M., & Hankin, B. L. (2010). Perceived physical appearance mediates the rumination and bulimic symptom link in adolescent girls. *Journal of Clinical Child and Adolescent Psychology*, 39(4), 537–544. <https://doi.org/10.1080/15374416.2010.486324>.

Hunt, M. G. (1998). The only way out is through: Emotional processing and recovery after a depressing life event. *Behaviour Research and Therapy*, 36(4), 361–384. [https://doi.org/10.1016/s0005-7967\(98\)00017-5](https://doi.org/10.1016/s0005-7967(98)00017-5).

Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences*, 55(4), 367–374. <https://doi.org/10.1016/j.paid.2013.03.019>.

Keune, P. M., Bostanov, V., Kotchoubey, B., & Hautzinger, M. (2012). Mindfulness versus rumination and behavioral inhibition: A perspective from research on frontal brain asymmetry. *Personality and Individual Differences*, 53(3), 323–328. <https://doi.org/10.1016/j.paid.2012.03.034>.

Le, L. K. D., Barendregt, J. J., Hay, P., & Mihalopoulos, C. (2017). Prevention of eating disorders: A systematic review and meta-analysis. *Clinical Psychology Review*, 53, 46–58. <https://doi.org/10.1016/j.cpr.2017.02.001>.

Leichner, P., Steiger, H., Puentes-Neuman, G., Perreault, M., & Gottheil, N. (1994). Validation d'une échelle d'attitudes alimentaires auprès d'une population québécoise francophone. *The Canadian Journal of Psychiatry*, 39(1), 49–54.

Maraldo, T. M., Zhou, W., Dowling, J., & Vander Wal, J. S. (2016). Replication and extension of the dual pathway model of disordered eating: The role of fear of negative

- evaluation, suggestibility, rumination, and self-compassion. *Eating Behaviors*, 23, 187–194. <https://doi.org/10.1016/j.eatbeh.2016.10.008>.
- Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. *Advances in social cognition*, 9, 1–47. <https://doi.org/10.1080/02699930802696849>.
- McLaughlin, K. A., Borkovec, T. D., & Sibrava, N. J. (2007). The effects of worry and rumination on affect states and cognitive activity. *Behavior Therapy*, 38(1), 23–38. <https://doi.org/10.1016/j.beth.2006.03.003>.
- Mendelson, B. K., Mendelson, M. J., & White, D. R. (2001). Body Esteem scale for adolescents and adults. *Journal of Personality Assessment*, 76(1), 901–906. https://doi.org/10.1207/s15327752jpa7601_6.
- Miller, G. A., & Chapman, J. P. (2001). Misunderstanding analysis of covariance. *Journal of Abnormal Psychology*, 110(1), 40. <https://doi.org/10.1037/0021-843X.110.1.40>.
- Mills, J. S., Polivy, J., Herman, C. P., & Tiggemann, M. (2002). Effects of exposure to thin media images: Evidence of self-enhancement among restrained eaters. *Personality and Social Psychology Bulletin*, 28(12), 1687–1699. <https://doi.org/10.1177/014616702237650>.
- Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: Evidence and theory. *Psychological Bulletin*, 101(2), 259. <https://doi.org/10.1037//0033-2909.101.2.259>.
- Nolen-Hoeksema, S., Stice, E., Wade, E., & Bohon, C. (2007). Reciprocal relations between rumination and bulimic, substance abuse, and depressive symptoms in female adolescents. *Journal of Abnormal Psychology*, 116(1), 198. <https://doi.org/10.1037/0021-843X.116.1.198>.
- Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for transdiagnostic models of psychopathology: Explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, 6, 589–609. <https://doi.org/10.1177/1745691611419672>.
- Opwis, M., Schmidt, J., Martin, A., & Salewski, C. (2017). Gender differences in eating behavior and eating pathology: The mediating role of rumination. *Appetite*, 110, 103–107. <https://doi.org/10.1016/j.appet.2016.12.020>.
- Rawal, A., Williams, J. M. G., & Park, R. J. (2011). Effects of analytical and experiential self-focus on stress-induced cognitive reactivity in eating disorder psychopathology. *Behaviour Research and Therapy*, 49(10), 635–645. <https://doi.org/10.1016/j.brat.2011.06.011>.
- Rivière, J., & Douilliez, C. (2017). Perfectionism, rumination, and gender are related to symptoms of eating disorders: A moderated mediation model [perfectionnisme, rumination et genre sont liés aux symptômes des troubles du comportement alimentaire]. *Personality and Individual Differences*, 116, 63–68. <https://doi.org/10.1016/j.paid.2017.04.041>.
- Rousseau, A., Valls, M., & Chabrol, H. (2015). Etude de la validation française de l'échelle d'estime corporelle (Body Esteem Scale) chez les adolescents et les jeunes adultes. *Revue Européenne de Psychologie Appliquée*, 65, 205–210. <https://doi.org/10.1016/j.erap.2015.06.001>.
- Russell, W. D., & Cox, R. H. (2003). Social physique anxiety, body dissatisfaction, and self-esteem in college females of differing exercise frequency, perceived weight discrepancy, and race. *Journal of Sport Behavior*, 26(3), 298.
- Sarwer, D. B., Wadden, T. A., Pertschuk, M. J., & Whitaker, L. A. (1998). Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients. *Plastic and Reconstructive Surgery*, 101(6), 1644–1649.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, 128, 825–848. <https://doi.org/10.1037/0033-2909.128.5.825>.
- Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research*, 53, 985–993. [https://doi.org/10.1016/s0022-3999\(02\)00488-9](https://doi.org/10.1016/s0022-3999(02)00488-9).
- Svaldi, J., & Naumann, E. (2014). Effects of rumination and acceptance on body dissatisfaction in binge eating disorder. *European Eating Disorders Review*, 22(5), 338–345. <https://doi.org/10.1002/erv.2312>.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Allyn & Bacon/Pearson Education.
- Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review*, 6(1), 2–30. https://doi.org/10.1207/s15327957pspr0601_1.
- Thompson, M. A., & Gray, J. J. (1995). Development and validation of a new bodyimage assessment scale. *Journal of Personality Assessment*, 64, 258–269. https://doi.org/10.1207/s15327752jpa6402_6.
- Valls, M., Callahan, S., Rousseau, A., & Chabrol, H. (2014). Troubles du comportement alimentaire et symptomatologie dépressive: Étude épidémiologique chez les jeunes hommes. *L'Encéphale*, 40(3), 223–230. <https://doi.org/10.1016/j.encep.2013.05.003>.
- Valls, M., Rousseau, A., & Chabrol, H. (2011). Étude de validation de la version française du Body Esteem Scale (BES) dans la population masculine. *Journal de Thérapie Comportementale et Cognitive*, 21(2), 58–64. <https://doi.org/10.1016/j.jtcc.2011.02.001>.
- Wade, T., George, W. M., & Atkinson, M. (2009). A randomized controlled trial of brief interventions for body dissatisfaction. *Journal of Consulting and Clinical Psychology*, 77(5), 845. <https://doi.org/10.1037/a0016879>.
- Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, 134(2), 163. <https://doi.org/10.1037/0033-2909.134.2.163>.
- Watkins, E., Moberly, N. J., & Moulds, M. L. (2008). Processing mode causally influences emotional reactivity: Distinct effects of abstract versus concrete construal on emotional response. *Emotion*, 8(3), 364. <http://dx.doi.org/10.1037/1528-3542.8.3.364>.
- Watkins, E. R., Mullan, E., Wingrove, J., Rimes, K., Steiner, H., Bathurst, N., ... Scott, J. (2011). Rumination-focused cognitive-behavioural therapy for residual depression: Phase II randomised controlled trial. *The British Journal of Psychiatry*, 199(4), 317–322. <https://doi.org/10.1192/bjp.bp.110.090282>.
- Watkins, E., & Teasdale, J. D. (2004). Adaptive and maladaptive self-focus in depression. *Journal of Affective Disorders*, 82(1), 1–8. <https://doi.org/10.1016/j.jad.2003.10.006>.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. <https://doi.org/10.1037//0022-3514.54.6.1063>.
- Watson, H. J., Joyce, T., French, E., Willan, V., Kane, R. T., Tanner-Smith, E. E., ... Egan, S. J. (2016). Prevention of eating disorders: A systematic review of randomized, controlled trials. *International Journal of Eating Disorders*, 49(9), 833–862. <https://doi.org/10.1002/eat.22577>.
- Young, C. C., & Dietrich, M. S. (2014). Screening for rumination and brooding may be a feasible method of identifying adolescents at high risk for depression. *Journal of Pediatric Nursing*, 29(6), 688–695. <https://doi.org/10.1016/j.pedn.2014.04.010>.