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SOCIAL PSYCHOLOGY | RESEARCH ARTICLE

Overindulging in food: How overeating may increase women's preference for stereotyped activities and objects

Anna Rita Graziani^{1*}, Margherita Guidetti^{1,2} and Nicoletta Cavazza¹

Abstract: Two experiments were designed to examine how transgressing the gender-based norm of restricting food intake (i.e., the “eating lightly” social norm), provoked in women the desire to engage in stereotypically feminine activities, such as watching a romance movie or wearing feminine items in order to balance the negative consequences of overindulging in food. Study 1 ($N = 110$) showed that after recalling an overeating episode (vs. remembering a situation in which they were able to control their food ingestion), women (but not men) experienced negative emotions that increased their desire to watch romance movies. Study 2 ($N = 123$) showed that an imagined overeating experience was perceived by women as an unfeminine behavior. This perception in turn induced negative emotions that increased the likelihood of preferring feminine objects. Finally, for these women, the choice of feminine objects improved their self-ascribed femininity. Our results contribute to the understanding of overeating as an identity-relevant behavior for women—able to generate psychological consequences beyond the food domain.

ABOUT THE AUTHORS

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PUBLIC INTEREST STATEMENT

Besides satisfying the body's needs, food can be guided by concerns for self-presentation. In social situations, we try to avoid eating excessively in front of others because we are aware that this behavior is likely to be negatively judged. These judgments are particularly harsh when the over-eater is a woman. According to a gender-based cultural expectation, women should “eat lightly” in order to appear feminine and attractive. However, despite women's tendency to restrict their food intake, overeating is a common experience in Western societies. What happens to a woman after she overindulges in food? In these two studies, we showed that overeating can have consequences that go beyond the food domain: after recollecting or imagining an episode of overeating, women experienced negative emotions which drove their preference for a gender-stereotypical activity (such as watching a romance movie, or preferring feminine wearing objects) in order to balance the violation of the “eating lightly” social norm.

Subjects: Gender Studies; Feminist Psychology; Health Psychology; Social Psychology

Keywords: gender stereotypes; eating behavior; overeating; impression management; social norms

The association between food intake and impression management has been widely discussed in the literature: People manage their eating behavior in social situations to give a particular impression of themselves to their companions (for a review, see Vartanian, 2015; Vartanian, Herman, & Polivy, 2007). In particular, individuals are concerned about eating excessively in front of others because they are aware that this behavior is likely to be judged negatively. These judgments are particularly harsh when the overeater is a woman. According to gender-based cultural expectations, women should consume smaller amounts of food in order to appear feminine and attractive. Therefore, regulating food intake can be considered an effective impression-management strategy (Vartanian et al., 2007).

While there is a vast literature on the link between food intake and impression management, less attention has been devoted to the *consequences* of overeating. In other words, what happens to persons after they overindulge in food? We can expect that, after an overeating experience, they decide to limit their consumption in subsequent meals. However, as food ingestion is guided by self-presentational concerns, overeating—especially in public—can have dramatic psychological and behavioral consequences that go beyond the food domain.

There are widespread gender-based stereotypes about the right amount of food one should consume. Compared to men, women should consider overeating in front of observers as a transgression to the “eating lightly” social norm. This transgression constitutes a threatening experience that induces negative emotions (e.g., guilt and shame). Therefore, after having overindulged, women should be motivated to endorse behaviors stereotypically associated with the feminine gender role in order to balance the negative effects of overeating. The following two studies aimed to verify this hypothesis.

1. Strategic food regulation

There is substantial consensus in the literature that eating lightly can provide social benefits to women in the form of more favorable interpersonal impressions: Women who eat lightly are considered more feminine, attractive, and more concerned about their physical appearance than women who ate large amounts of food (Barker, Tandy, & Stookey, 1999; Basow & Kobrynowicz, 1993; Bock & Kanarek, 1995; Chaiken & Pliner, 1987; Martins, Pliner, & Lee, 2004; Oakes & Slotterback, 2004; Pliner & Chaiken, 1990). Taken together, these studies emphasize that eating lightly (at least in social situations) may be socially advantageous for women “because it increases the likelihood that they will be perceived as possessing positive personality characteristics and decreases the likelihood that they will be perceived as possessing negative personality characteristics” (Martins et al., 2004, p. 119).

Regarding men, most of the literature indicates that the perception of male participants’ masculinity and attractiveness is much less influenced by meal size (Bock & Kanarek, 1995; Chaiken & Pliner, 1987; Pliner & Chaiken, 1990; Stein & Nemeroff, 1995; Vartanian, 2015).

Through socialization, individuals learn masculine or feminine eating styles (Rolls, Fedoroff, & Guthrie, 1991) and the consequences of behaving congruently with these social expectations. Therefore, women in particular tend to prefer behaviors that align with sex-role expectations as a function of impression management motivations (for a review, see O’Doherty Jensen & Holm, 1999). Indeed, both men and women tended to eat less while in the presence of an opposite-sex eating companion. However, women were found to restrict their intake specifically in the presence of a desirable man and when their gender-identity was threatened (Mori, Chaiken, & Pliner, 1987).

In other words, when women were aware that their own behavior was likely to be judged on the stereotypical association between minimal eating and femininity, they tended to limit their food ingestion to convey a positive and feminine image.

Further studies confirm how women strategically varied their intake as a function of the social setting: in dyads, women ate more caloric food when their co-eater was a woman rather than a man (Young, Mizzau, Mai, Sirisegaram, & Wilson, 2009). They ate less with an opposite-sex stranger than with their romantic partner (Salvy, Jarrin, Paluch, Irfan, & Pliner, 2007). In groups, however, women ate less as the number of male companions rose, whereas the presence of other women seemed to raise food consumption (Young et al., 2009).

Focusing on the social motives perceived as appropriate in an interpersonal situation involving eating, Pliner and Chaiken (1990) found that, even though eating lightly was considered by both men and women to be an appropriate strategy for conveying a favorable impression, women reported that appearing feminine represented another fundamental motive for restraining their consumption.

Despite women's tendency to restrict their food intake, overeating is a common experience in Western societies. Overindulging in food is encouraged by the current social environment (i.e., there are many opportunities to find convenient, relatively inexpensive, highly palatable, but unhealthy foods). It is also encouraged by the frequency of convivial meals. People tend to eat more in groups than when they are alone, especially with friends and relatives, and this effect is stronger as the number of co-eaters increases (Herman, 2015). Furthermore, overeating is more likely when people dine out (Martens, 1997). In those situations, individuals activate a shared script of the "social meal," inducing the expectation to eat more in the presence of familiar others (Cavazza, Graziani, & Guidetti, 2011).

Given this motivation of women to eat lightly and the frequent opportunities to overeat, what happens when they overindulge? A long line of research has been done on the psychological antecedents of overeating (e.g., Macht, 2008), whereas much less is known about the psychological consequences of this behavior.

It is plausible to hypothesize that if women believe they should eat lightly on social occasions, but they eat too much, then they would feel uncomfortable. Focusing on women's reactions after overeating, the literature confirmed that their failure to restrain eating induced negative feelings, such as embarrassment, shame, and guilt (Sheikh, Botindari, & White, 2013). Similarly, women felt stronger negative emotions (e.g., shame) and felt weaker positive emotions (e.g., happiness) after eating caloric and unhealthy food (Macht & Dettmer, 2006; Macht, Gerer, & Ellgring, 2003).

As suggested by the Cognitive Dissonance Theory (Festinger, 1957) and by the Balance Theory (Heider, 1958), we could imagine that the discomfort associated with overeating would lead to some compensatory mechanisms. The results obtained by Sheikh et al. (2013) are in line with this hypothesis. The authors showed that restrained eating practices were moralized among women and that the regulation of their food intake was embodied in their feelings of physical cleanliness. In particular, they found that remembering an overeating experience increased the accessibility of words related to physical cleanliness (Study 1) and led to a desire for physical cleanliness. This was expressed by choosing cleansing products (i.e., anti-bacterial hand-gel or a packet of "wipe-n-go" vs. neutral objects) that seem to wash away their food transgression (Study 2). Moreover, the negative emotions (e.g., shame) fully mediated the impact of overeating on the desire for cleaning products. To the best of our knowledge, this is the only study showing that recalling an overeating episode elicits negative emotions in women, which in turn may influence the preference for an object not related to the food domain in order to restore positive affect. In addition to being perceived as a moral failure as documented by Sheikh et al. (2013), overeating may also be perceived by women as an uncomfortable experience, because it represents a violation of the

implicit social norm according to which women should limit their food intake to appear feminine. Consequently, women should be motivated to resolve this uncomfortable situation by re-establishing a positive and feminine self-image.

We devised the following studies to test this hypothesis. Specifically, we expected that after recalling or imagining an episode of overeating, women would experience negative emotions. These negative emotions would drive a preference for gender-stereotypical activities to balance the negative consequences of transgressing the implicit “eating lightly” norm. We employed different types of gender-stereotypical activities. In the first study, we considered the desire to watch different movie genres strongly associated with female and male audiences (e.g., romance, action, and adventure movies). There is some evidence that movie preferences represent strategic tools to present oneself to others: the manipulation of different self-presentational motivations (i.e., to present the ideal self or to make a highly positive impression on others) leads participants to share different types of movies in social networks (Johnson & Ranzini, 2018). In the second study, we considered the preference for wearing objects that were more or less feminine.

2. Study 1

We hypothesized that for women, eating too much—especially in public—represented a transgression of the “eating lightly” social norm and therefore was a threatening experience. Given research showing that the impression of men is much less influenced by meal size, we did not expect this effect among men. Consequently, we anticipated that:

Hypothesis 1: Women that recall an episode in which they overindulged in food (vs. women that remember an episode in which they ate a regular amount of food) will express a strong preference for movies that are considered typically feminine (i.e., romance movies) in order to balance the negative consequences of transgressing the “eating lightly” social norm. Since previous studies showed that impressions about men are less affected by their food consumption, we did not expect that eating too much would influence men’s desire to watch action or adventure movies.

Hypothesis 2: Remembering an overeating episode affects women’s (but not men’s) desire for gender-congruent movies because of adverse feelings related to eating out. Hence, we tested a model of moderated mediation in which gender moderates the independent variable-mediator link (i.e., recalling an overeating experience worsened the emotional state in women but not in men), and these adverse feelings would increase women’s desire to watch romance movies.

3. Method

3.1. Participants

One hundred and ten Italian adults (58 women) aged 20 to 67 years ($M = 40.76$, $SD = 10.99$) were recruited through personal mailing lists and snowball sampling. They gave their informed consent to participate in the study.

Participants completed an online questionnaire that was presented as investigating two of the most preferred free-time activities in Italian society: eating out and watching movies. The questionnaire was implemented on the LimeSurvey platform.

3.2. Design and procedure

Participants were randomly assigned to recall either an overeating or a normal eating situation in the control condition. Following the procedure adopted by Sheikh et al. (2013), participants in the experimental condition read instructions asking them to remember the last time that, dining in a restaurant, they ate too much. Participants in the control condition read instructions asking them to remember the last time that, dining in a restaurant, they ate an amount of food that let them

feel satisfied but not feeling heavy. In contrast to the procedure of Sheikh et al. (2013), who asked participants to think back to a generic overeating episode, and in order to stress that the behavior was public, our respondents were required to remember a specific episode in which they ate in a restaurant with other people. Participants also indicated some details of the episode such as the type of dinner (whether it was a romantic, business, convivial, or a family meal), the dishes they ate, and the number and gender of adult co-eaters.

Participants answered a series of questions about the emotions related to the amount of food they consumed and the degree to which they wanted to watch different types of movies (the critical dependent variables, see below). Finally, they answered socio-demographic questions and were debriefed with an explanation about the aim of the study.

3.3. Measures

3.3.1. Emotions related to the eating out experience

Eight items were selected from previous studies (Desmet & Schifferstein, 2008; Sheikh et al., 2013) to assess how ashamed, gratified, satisfied, guilty, pleased, embarrassed, good, or uneasy they felt considering the amount of food they ate. Responses were given on a 7-point scale (from 1 = *not at all* to 7 = *extremely*). A factor analysis (i.e., principal components analysis and oblimin rotation) elicited two factors that explained 79.73% of the variance. Two indexes were calculated: *negative emotions* (as a mean of four items: feeling ashamed, guilty, embarrassed, and uneasy, $\alpha = .84$), and *positive emotions* (as a mean of the other four items: gratified, satisfied, pleased, and good, $\alpha = .94$).

3.3.2. Desire to watch different movie genres

The critical dependent variable was the desire to watch different movie genres varying in stereotypical gender-based connotations (see below). Participants were asked, “How much would you like to watch the following movie genres at this precise moment?” Then six movie genres—romance, drama, comedy, thriller, action, and adventure—were presented, and participants answered on a 7-point scale (from 1 = *not at all* to 7 = *very much*). Action, adventure, and romance movie genres are strongly stereotyped along sex-linked lines. While genres such as action and adventure are generally perceived to fall in the “male” domain of entertainment, romance movies are generally perceived to fall in the “female” domain of entertainment (Fischoff, Antonio, & Lewis, 1998; Oliver, Weaver, & Sargent, 2000; Wühr, Lange, & Schwarz, 2017). The widespread gender stereotypes about these genres correspond to actual viewers’ preferences: women indeed favor romance films and men favor action movies (Wühr et al., 2017). Greenwood (2010) showed that this gendered movie preference was not simply related to participants’ emotions. By manipulating participants’ mood (happy vs. sad), the author found that women preferred romantic genres whereas men preferred action genres, regardless of mood.

Instead, thriller, drama, and comedy movie genres were perceived as being equally favored by women and men (Fischoff et al., 1998). However, as most of the studies linking movie genres to gender preferences were carried out in the United States, we ran a pilot study to determine whether those results applied to the Italian context, in which the main study was performed.

Twenty-three participants (11 women) aged 20 to 67 years ($M = 33.76$, $SD = 9.88$) were recruited through snowball sampling and gave their informed consent to participate in the study. Participants completed an online questionnaire that was presented as investigating the relevance of different movie genres to Italian audiences. The questionnaire, implemented on the LimeSurvey platform, used a 7-point scale (from 1 = *mainly preferred by men* to 7 = *mainly preferred by women*, with the midpoint of 4 = *equally preferred by men and women*). Participants were asked to indicate if romance, drama, comedy, thriller, adventure, and action movie genres were associated with males, females, or both kinds of audiences.

To determine if the movie genres were mainly attributed to male or female spectators, a series of one-sample *t*-tests were performed to compare the different movie categories with the scale midpoint (i.e., 4). The results confirmed that romance ($M = 6.45$, $SD = .74$; $t(22) = 15.59$, $p < .001$, $d = 6.65$) was perceived as the most typical female movie genre, whereas action ($M = 2.00$, $SD = .76$; $t(22) = -12.41$, $p < .001$, $d = -5.29$) and adventure movies ($M = 2.68$, $SD = .78$; $t(21) = -7.93$, $p < .001$, $d = -3.46$) were considered the most typical male movie genres. The results for drama ($M = 4.61$, $SD = 1.07$; $t(22) = 2.71$, $p = .01$, $d = 1.16$), comedy ($M = 4.65$, $SD = 1.19$; $t(22) = 2.63$, $p = .02$, $d = 1.12$), and thriller movies ($M = 3.18$, $SD = .85$; $t(22) = -4.50$, $p < .001$, $d = -1.93$) also showed significant differences with the midpoint, placing thrillers on the “masculine” side and drama and comedy on the “feminine” side. However, the means indicate that judgments about romance, adventure, and action genres were more polarized than the evaluations of drama, thriller, and comedy genres.

3.3.3. Gender stereotypes about movie genres

As in the pilot study, the different movie categories (romance, drama, comedy, thriller, adventure, and action) were re-presented as a manipulation check at the end of the main study questionnaire. Participants were invited to specify on a 7-point scale (from 1 = *mainly preferred by men* to 7 = *mainly preferred by women*, with the midpoint scale of 4 = *equally preferred by men and women*) if these different genres were associated mostly with males, females, or both audiences.

4. Results

4.1. Preliminary analyses and manipulation checks

Most participants recalled a convivial dinner (i.e., with friends or acquaintances) or a family dinner. Only 17 respondents (15.5%) participated in a business or in a romantic meal. Due to the insufficient number of cases, we did not employ this measure of meal setting in the subsequent analysis.¹

The correlation analyses revealed that for women—but not men—their age ($r = .28$, $p = .033$) and the number of female adult co-eaters ($r = -.34$, $p = .011$) were correlated with the desire to watch a romance movie. For this reason, we controlled for these variables and their interactions with gender in the analyses concerning our critical dependent variable.

For the manipulation check concerning eating conditions, we counted the number of dishes each participant reported having eaten during the dinner. To verify whether male and female participants ate more food when overeating than in the normal eating condition, we performed a 2 (eating condition: overeating vs. normal eating) \times 2 (participant's gender: females vs. males) univariate ANOVA on the number of dishes each respondent consumed. The analysis confirmed that participants who overate recalled more food being eaten ($M = 3.85$, $SD = 1.71$) than those in the normal eating control condition ($M = 2.60$, $SD = 1.32$), $F(1, 87) = 15.34$, $p < .001$, $\eta^2 = .14$. In addition, men reported having eaten slightly more ($M = 3.37$, $SD = 1.81$) on average than women ($M = 2.79$, $SD = 1.32$), $F(1, 87) = 3.58$, $p = .062$, $\eta^2 = .04$. The interaction between the eating condition and the gender of participants was not significant, $F(1, 87) = .79$, $p = .376$.

To determine the gender connotation associated with the proposed movie genres, a series of one sample *t*-tests were performed comparing the different movie genres with the scale midpoint (i.e., 4). The results were in line with the pilot study: romance movies were perceived as mainly being preferred by women ($M = 6.14$, $SD = 1.05$; $t(109) = 21.45$, $p < .001$, $d = 4.11$), whereas action ($M = 2.43$, $SD = 1.05$; $t(108) = -15.62$, $p < .001$, $d = -3.09$) and adventure movies ($M = 3.09$, $SD = .96$; $t(108) = -9.09$, $p < .001$, $d = -1.91$) were perceived as mainly being preferred by men. Regarding comedy ($M = 4.50$, $SD = 1.14$; $t(108) = 4.52$, $p < .001$, $d = .87$), drama ($M = 4.64$, $SD = .94$; $t(108) = 7.15$, $p < .001$, $d = 1.38$), and thriller movies ($M = 3.61$, $SD = .81$; $t(109) = -5.04$, $p < .001$, $d = -.97$) the one-sample *t*-tests showed significant results. However, a closer look to the means confirmed that whereas romance movies were perceived as being strongly attributed to women, and action and

adventure to men, judgments about comedy, drama, and thriller movies were less stereotyped and polarized (as found in the pilot study).

4.2. Overeating, gender, and emotions

Table 1 reports descriptive statistics for all measures. A two-way MANOVA was performed on the negative and positive emotions, including the eating condition and participants' gender as factors.

The analysis revealed a significant multivariate main effect of the eating condition, Wilks' $\lambda = .90$, $F(2, 105) = 6.14$, $p = .003$, $\eta^2 = .11$, and a marginally significant main effect of participants' gender, Wilks' $\lambda = .95$, $F(2, 105) = 2.68$, $p = .073$, $\eta^2 = .05$. A marginally significant multivariate interaction effect also emerged, Wilks' $\lambda = .95$, $F(2, 105) = 2.95$, $p = .057$, $\eta^2 = .05$. Given these results, the univariate effects were examined (see Table 2).

For negative emotions, significant univariate main effects were obtained for the eating condition, $F(1, 106) = 5.89$, $p = .017$, $\eta^2 = .05$, and for participants' gender, $F(1, 106) = 4.41$, $p = .038$, $\eta^2 = .04$. Even though participants in general did not express strong negative emotions, they felt worse when they overate ($M = 1.66$, $SD = 1.20$) than when they consumed a regular amount of food ($M = 1.20$, $SD = .62$; Welch's *t*-test for unequal variances, $t(70.39) = 5.74$, $p = .019$). Moreover, women ($M = 1.58$, $SD = 1.05$) reported more negative feelings than men ($M = 1.23$, $SD = .80$). The interaction effect was marginally significant, $F(1, 106) = 3.58$, $p = .061$, $\eta^2 = .03$. However, an independent sample *t*-test run separately on female and male participants revealed that females felt worse after overeating compared to the normal eating control condition, $t(56) = -2.88$, $p = .006$, $d = .77$. Males did not show different negative emotions about the two eating conditions, $t(50) = -.41$, $p = .682$. Moreover, no significant differences were found between men and women in the normal eating condition, $t(58) = -.22$, $p = .824$. In the overeating condition, women experienced more negative emotions than did men, $t(48) = -2.11$, $p = .040$, $d = .61$ (see Figure 1).

For positive emotions, only the main effect of eating condition, $F(1, 106) = 11.21$, $p = .001$, $\eta^2 = .10$, was significant. Participants felt better when they consumed a regular meal ($M = 5.55$, $SD = 1.03$) than when they overate ($M = 4.72$, $SD = 1.55$). Neither the main effect of respondents' gender, $F(1, 106) = .00$, $p = .996$, nor the interaction between the independent variables, $F(1, 103) = .33$, $p = .566$, were significant (see Table 2).

4.3. Overeating, gender, and movie preferences

The univariate ANOVA including the two independent variables (eating condition and participants' gender) performed on the desire to watch romance movies (with age and number of female co-eaters and their interaction with gender as covariates²) did not reveal the significant effects of gender, $F(1, 98) = 1.86$, $p = .175$, nor of eating condition, $F(1, 98) = 1.97$, $p = .164$. In line with our Hypothesis 1, the analysis revealed a significant interaction effect, $F(1, 98) = 4.64$, $p = .034$, $\eta^2 = .05$. The independent sample *t*-test showed that, in line with Hypothesis 1, overeating (vs. eating normally) induced the desire to watch romance movies only in the case of female participants, $t(56) = -2.55$, $p = .013$, $d = .45$. For male participants, the amount of food consumed did not influence the desire to watch romance movies, $t(50) = .16$, $p = .875$ (see Table 2). The same analysis on the desire to watch comedy revealed the main effect of respondents' gender, $F(1, 106) = 7.87$, $p = .006$, $\eta^2 = .07$. Women ($M = 5.69$, $SD = 1.77$) showed a stronger preference for these kinds of movies than did men ($M = 4.77$, $SD = 1.62$). However, neither the main effect of the eating condition, $F(1, 106) = .54$, $p = .463$, nor the interaction between the independent variables was significant, $F(1, 106) = .04$, $p = .851$.

The same analyses performed on the desire to watch the other movie genres (action, adventure, thriller, and drama) did not reveal the main effect of participants' gender (all $ps > .075$) nor the main effect of the eating condition (all $ps > .205$). Also, the interaction effects were not significant (all $ps > .117$).

Table 1. Descriptive Statistics and Correlations (Study 1).

	<i>M (SD)</i>	Correlations							
		1	2	3	4	5	6	7	8
1. Negative emotions	1.41 (.95)	-	-.47***	.23	-.14	-.09	.23	.01	.21
2. Positive emotions	5.17 (1.35)	-.27*	-	-.03	.30*	.27	-.10	.16	-.24
3. Romance Movies	3.87 (2.06)	.20	.12	-	.02	.16	.47***	-.02	.10
4. Action Movies	4.41 (1.84)	.05	.09	.10	-	.70***	.19	.42**	-.07
5. Adventure Movies	4.35 (1.91)	.05	.02	.20	.77***	-	.17	.23	.01
6. Comedy Movies	5.25 (1.75)	-.04	.06	.35**	.12	.16	-	.01	.03
7. Thriller Movies	4.28 (1.93)	.06	.10	.17	.32**	.39**	.25	-	.16
8. Drama Movies	3.85 (1.86)	.09	-.16	.27*	.24	.40**	.54***	.34**	-

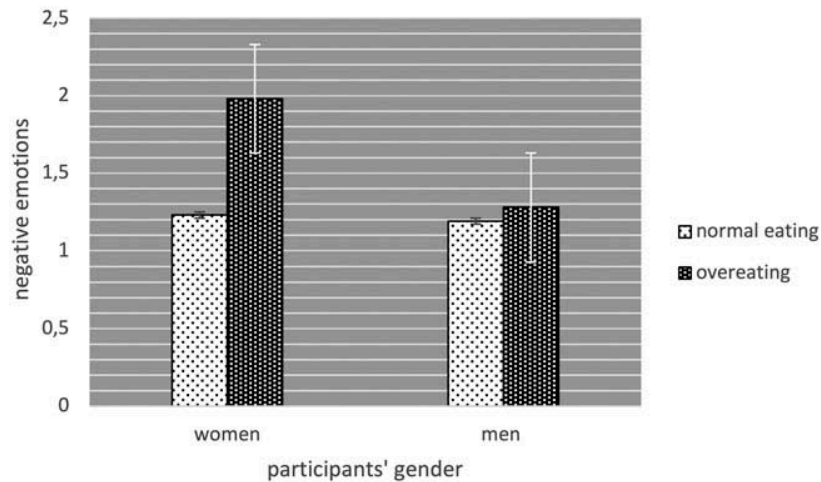
Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Correlations are reported by condition: control condition on the bottom and overacting condition on top half of the matrix respectively.

Table 2. Means and standard deviations (in parentheses) of the eating experience emotions and the desire to watch different movie genres as a function of the eating recall task and participants' gender (Study 1).

	Female Participants		Male participants	
	Control condition	Overeating condition	Control condition	Overeating condition
Negative emotions	1.23 _b (.42)	1.98 _a (1.43)	1.19 _b (.79)	1.28 _b (.82)
Positive emotions	5.48 _b (1.13)	4.78 _a (1.61)	5.62 _b (.92)	4.64 _a (1.53)
Romance Movies	4.39 _b (1.76)	5.56 _a (1.72)	2.72 _c (1.75)	2.65 _c (1.53)
Action Movies	4.00 _a (1.98)	4.19 _{ab} (1.82)	5.17 _b (1.39)	4.26 _{ab} (2.01)
Adventure Movies	4.26 _a (2.10)	3.96 _a (2.08)	4.90 _a (1.65)	4.26 _a (1.68)
Comedy Movies	5.55 _{ab} (1.84)	5.85 _a (1.70)	4.69 _b (1.67)	4.87 _{ab} (1.58)
Thriller Movies	4.58 _a (1.98)	4.07 _a (2.13)	4.39 _a (1.83)	3.96 _a (1.80)
Drama Movies	3.97 _a (1.85)	3.97 _a (1.85)	3.90 _a (1.92)	3.50 _a (1.79)

Note: Scales range is 1–7 with higher values indicating more intense negative and positive emotions, and higher desire to watch each specific movie genre. Means in a same row that do not share subscripts differ at $p < .05$.

Figure 1. Means of negative emotions as a function of the eating conditions and gender (Study 1).

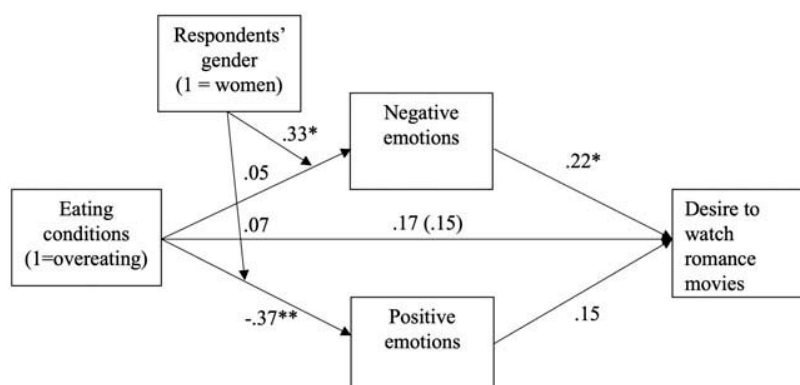


4.4. Conditional indirect effect

To test whether the effect of overeating on women’s desire to watch gender-congruent movies was mediated through emotions (Hypothesis 2), we tested Model 7 using PROCESS, the SPSS-macro provided by Hayes (2013). We entered participants’ age and the number of female co-eaters as control variables and settled 5,000 bootstrap re-samples (Figure 2). Positive and negative emotions were tested simultaneously as multiple mediators.

Figure 2. Conditional indirect effect model (Study 1).

Note: Standardized beta coefficients are reported. * $p < .05$; ** $p < .01$ (interactions between eating conditions and participants' gender are reported, total effect beta is reported in parentheses).



The results showed that eating too much increased the desire to watch romance movies through the negative emotions induced in women by that experience. The 95% confidence interval (see Table 3) indicated a significant conditional indirect effect of the amount of food consumed through negative emotions on the desire to watch romance movies, but only for female participants. Specifically, recalling a dinner where they overate increased women's negative feelings, which in turn augmented their desire to watch romance movies.

Considering the positive emotions, the results showed that overeating weakened positive emotions but that this relationship was not moderated by the participants' gender. Moreover, positive emotions did not exert any influence on the desire to watch romance movies.

5. Discussion

The results of this study confirmed that women, in contrast to men, tend to experience more negative feelings, such as guilt and shame, after recalling an overeating episode compared to a situation in which they were able to control their food intake. Moreover, recalling overeating (rather than eating normally) induced women to express a stronger preference for stereotypical feminine movies (i.e., romance movies). This choice was made presumably as a means of contrasting the negative emotions due to the transgression of the feminine-specific "eating lightly" social norm (H1). A weaker stereotypical feminine choice (i.e., drama and comedy movies) was not enough to serve the same function.

In line with studies documenting that gender-based stereotypes about food are more binding for women than for men (Cavazza, Guidetti, & Butera, 2015a; Chaiken & Pliner, 1987; Pliner & Chaiken, 1990), these effects did not extend to men, confirming that overeating is likely not a socially problematic behavior for them.

Despite the low intensity of the negative emotions observed, the results confirmed a conditional indirect effect of overeating on women's desire to watch a romance movie through the negative emotions that eating too much raised in them (H2). This is likely due to the social norms which dictate that, in order to be feminine and socially desirable, women should eat lightly (Pliner & Chaiken, 1990).

Indeed, the non-significant result concerning comedy confirmed that women's preferences were not expressed in relation to the general need to find relief from a negative affect (e.g., through an enjoyable, comedic film). In other words, the different patterns for romance and comedy support our interpretation that after overeating, a romance movie is chosen because it represents a stereotypical feminine activity that matches a gender-specific transgression and not simply because it is a pleasant activity. In the same vein, Greenwood (2010) found that women's

Table 3. Direct and indirect effects of the eating condition on the desire to watch romance movies when the negative and the positive emotions are the mediators and respondents' gender is the moderator (Study 1).

	B	SE	t	p	R²
Mediator (negative emotions) model					
Constant	1.19	.17	7.04	.000	
Eating condition (1 = overeating)	.11	.26	.41	.682	
Participants' gender (1 = female)	.04	.24	.15	.878	
Eating condition × Pp's gender	.76	.36	2.12	.036	
					.14**
Mediator (positive emotions) model					
Constant	5.62	.24	23.19	.000	
Eating condition (1 = overeating)	-.99	.37	-2.70	.008	
Participants' gender (1 = female)	-.15	.34	-.43	.668	
Eating condition × Pp's gender	.24	.51	.46	.647	
					.10**
Dependent variable (desire to watch romance movies model)					
Constant	1.21	1.46	.83	.411	
Negative emotions	.47	.23	2.04	.044	
Positive emotions	.23	.16	1.41	.162	
Eating condition (1 = overeating)	.71	.41	1.71	.091	
Age	.02	.02	.64	.527	
Female co-eaters	-.19	.09	-2.07	.041	
Gender x Age	.29	.40	.72	.470	
Gender x Female co-eaters	.27	.10	2.86	.005	
					.17**
	Bootstrapped indirect effect estimate	Bootstrapped SE 95%	95% CI		
			Lower	Upper	
Romance Movies					
Conditional indirect effect of the eating conditions through negative emotions for men and women.					
Men	.05	.11	-.139	.298	
Women	.41	.28	.006	1.113	
Conditional indirect effect of the eating conditions through positive emotions for men and women.					
Men	-.23	.23	-.877	.078	
Women	-.17	.17	-.671	.055	

Note: **p < .01

preferences for the romance movie genre were not related to their mood (happy or sad). Therefore, we could infer that, for our female participants, it was not the mood itself but the desire to restore a positive emotional state by enhancing their feminine self-image that drove their wish to see a romance movie.

However, this study has some limitations. First, we did not directly assess if recalling an over-eating episode actually threatened the femininity of our female participants. Similarly, we did not verify if choosing a gender-congruent movie succeeded in re-establishing the self-perception of femininity.

Furthermore, we limited our test to the manipulation of meal size by asking participants to indicate an episode in which they consumed more food than necessary. However, we cannot be sure that the participants' reactions to those recollections were not influenced by the type of food consumed (i.e., masculine food [e.g., meat] or feminine food [e.g., fish]). Indeed, besides food quantity, the type of food may exert a strong influence on this identity aspect, and the dimensions of amount and type of food are often confounded in the literature (Cavazza, Guidetti, & Butera, 2015b), even if recent results suggest that quantity is a preferential way to communicate gender identity compared to food type (Cavazza, Guidetti, & Butera, 2017). Study 2 aimed to overcome these limitations. Moreover, in Study 1, we investigated women's preference toward only one kind of stereotyped object, that is, romance movies. In the second study, we analyzed whether the hypothesized processes can be generalized to other stereotyped preferences, such as the desire to wear feminine objects.

6. Study 2

Given the results of Study 1, we hypothesized that overeating is considered by women to be a gender-nonconforming behavior because it represents a violation of the "eat lightly" social norm. Specifically, we intended to verify whether the awareness of transgressing the gender stereotype about food leads women to restore their feminine self-image by preferring to wear feminine objects. In particular, given past research concerning the "eating lightly" social norm, we expected that:

Hypothesis 1: Women consider overeating (vs. eating a normal amount of food) to be a gender nonconforming behavior by judging it as unfeminine.

Hypothesis 2: The awareness of performing a gender-nonconforming behavior, in turn, increases negative emotions elicited by the eating experience which in turn increases the likelihood of wanting to wear feminine objects (i.e., three-step model).

Hypothesis 3: The preference for feminine objects, as a means to restore one's own self-image, positively influences the perception of one's own femininity.

As previously shown, overeating is not a problematic behavior for men's gender identity. For this reason, the present study involved only female participants.

7. Method

7.1. Participants

One hundred and twenty-three Italian women aged 20 to 60 years ($M = 34.88$, $SD = 12.26$) were recruited through personal mailing lists, Facebook contacts, and snowball sampling. They gave their informed consent to participate in the study and completed an online questionnaire about the preferences of Italian women for different types of objects they could wear. The questionnaire was implemented on the LimeSurvey platform.

7.2. Design and procedure

Women were randomly assigned to an overeating condition or a normal eating control condition. In Study 1, we manipulated the meal size by asking respondents to indicate an episode in which they overate (vs. ate a normal amount of food). However, we could not be sure that, besides the quantity of food, participants' recollection was not influenced by the type of food consumed (e.g., masculine food [e.g., meat] or feminine food [e.g., fish]). To disentangle the effects of portion size from that of food type, we exposed participants to pictures of two courses (a dish of pasta with tomato sauce and a Caprese salad), operationalizing the independent variable. For the large portion, we arranged in a white dish 200 grams of spaghetti with tomato sauce and in another white dish 200 g of mozzarella cheese with 100 g of tomatoes, dressed with 10 g of olive oil. The normal portion contained half as much of the same ingredients. These two courses were chosen as not deviating from gender norms: pasta is a typical Italian dish perceived as neutral in terms of gender. The Caprese salad is a popular Italian dish perceived to be a typical feminine food (Cavazza et al., 2015b). Participants were asked to imagine a dinner at a restaurant together with other people during which they ate the two depicted dishes. Then, they answered a question relative to the manipulation check (portion size) and the dependent variables (see below). Finally, they answered socio-demographic questions, indicated their weight and their height, and were debriefed with an explanation about the aim of the study.

7.3. Measures

7.3.1. Manipulation checks

Perceived portion size served as manipulation checks. We asked participants, "Imagine you have really eaten these two dishes. How much do you think you would have eaten?" The perceived portion was assessed by a 7-point scale ranging from 1 (*I would have eaten a little*) to 7 (*I would have eaten a lot*).

7.3.2. Perceived femininity of the imagined eating behavior

After having imagined eating the two depicted courses, participants were asked to evaluate their fictitious eating behavior by means of two 7-point bipolar items anchored to either "very unfeminine" or "very unmasculine" (= 1) and either "very feminine" or "very masculine" (= 7). After reversing the item concerning masculinity, we calculated an index of feminine eating behavior as a mean of the two items ($r = .37, p < .001$).

7.3.3. Emotions related to the imagined eating experience

Fourteen items were selected to assess both self-conscious emotions (i.e., guilty or proud, Tracy & Robins, 2004) and emotions focused on the eating experience itself (i.e., disgusted, satisfied). In particular, participants indicated how disgusted, proud, angry, pleased, anxious, sad, ashamed, gratified, satisfied, guilty, embarrassed, good, happy, or uneasy they imagined being after eating the fictitious dishes on a 7-point scale (from 1 = *not at all* to 7 = *extremely*). The emotions were randomly presented. A factor analysis (i.e., principal components analysis and oblimin rotation) elicited two factors, explaining 60.04% of the variance. Two indexes were calculated: *negative emotions* (as a mean of eight items: disgusted, angry, anxious, sad, ashamed, guilty, embarrassed, and uneasy, $\alpha = .92$), and *positive emotions* (as a mean of the other six items: proud, pleased, gratified, satisfied, happy, and good, $\alpha = .91$).

7.3.4. Feminine objects forced-choice task

Following Sheikh et al. (2013), we employ a forced-choice measure to assess the preference for feminine objects, our critical dependent variable. To identify wearing objects characterized by high and low levels of femininity, we conducted a pilot study in which we presented different types of wearable objects and asked participants to rate each item in terms of its femininity. Seventy-two women aged 20 to 78 years ($M = 31.57, SD = 14.42$) were recruited through snowball sampling; they gave their informed consent to participate in the study. They

completed an online questionnaire, implemented on the LimeSurvey platform, that was presented as a study on the evaluation of women's wearing objects. Participants indicated on a 5-point scale (from 1 = *very unfeminine* to 5 = *very feminine*) the degree of femininity of 23 different wearable objects. The objects belonged to different categories: shoes, bags, bras, pajamas, and nightgowns. To detect which objects were characterized by high or low degrees of femininity, we performed a series of one-sample *t*-tests comparing the score of each object with the scale midpoint (i.e., 3). Then we selected six highly feminine objects, perceived as significantly more feminine than the scale midpoint (all *ps* < .049) and six objects perceived as less feminine than the scale midpoint (all *ps* < .003, with the only exception of a black sportive bra, *p* = .066, that was the least feminine choice among the pre-tested bras).

Therefore, in Study 2, we presented the six pairs of selected wearable objects, paired on the basis of the categories, in such a way that for each category (e.g., shoes) we had a very feminine object (e.g., high heel shoes) and an unfeminine object (e.g., Dr. Martens boots). We had four pairs of shoes, two bags, two bras, two pairs of pajamas, and two nightgowns. For each category, we asked participants to choose the one they wanted to wear at this precise moment. The six pairs of objects were randomly presented. The total number of feminine selections was retained as a preference for feminine objects ranging from 0 to 6.

7.3.5. After-choice self-ascribed femininity

Respondents filled in the 6-item Traditional Femininity/Masculinity Scale (Kachel, Steffens, & Niedlich, 2016) developed to assess central facets of self-ascribed masculinity-femininity (i.e., self-definition, ideal self-image, interests, attitudes, behaviors, outer appearance). Responses were given on a 7-point scale (from 1 = *very masculine* to 7 = *very feminine*). The factor analysis (i.e., principal components analysis and oblimin rotation) elicited one factor, explaining 58.47% of the variance. The index of self-ascribed femininity was obtained by averaging the six items. Higher values indicated a stronger self-ascription of femininity ($\alpha = .86$).

7.3.6. Body mass index (BMI)

To verify whether BMI would influence the relationships among overeating, perceived femininity, the emotions associated with the fictitious eating experience, and the preference for feminine objects, we calculated the BMI by dividing participants' body mass by the square of their own height.

8. Results

8.1. Manipulation check

The independent sample *t*-test on portion size (large vs. normal) confirmed that the dishes depicted in the large portion were evaluated as larger ($M = 5.67$, $SD = 1.33$) than dishes depicted in the normal portion ($M = 4.62$, $SD = 1.20$), $t(121) = 4.45$, $p < .001$, $d = .83$.

8.2. Preliminary analysis

Table 4 reports descriptive and correlation analyses for all measures. The correlation analyses conducted on the whole sample revealed that participants' age was correlated to the perceived femininity of the imagined eating behavior ($r = .20$, $p < .05$), and to the preference for feminine objects ($r = .23$, $p < .01$). For this reason, we controlled for the effects of age in the analyses on those variables. As BMI was not correlated to any dependent measure in either condition, we did not include it in subsequent analyses.

It is noteworthy that the preference for feminine objects and the after-choice self-ascribed femininity were strongly correlated. This correlation was particularly marked for the large portion compared with the normal portion.

Table 4. Correlations, means and standard deviations (in parentheses) of all measures as a function of the eating conditions (Study 2).

	M (SD)		Correlations						
	Normal eating Condition	Overeating Condition	1	2	3	4	5	6	7
1. Perceived femininity of the eating behavior	5.12 (1.05)	4.52 (1.18)	-	-.35**	.29*	.02	.18	-.32*	-.13
2. Negative emotions	1.50 (0.85)	1.96 (1.34)	-.26*	-	-.46***	.22	.11	-.12	.05
3. Positive emotions	4.30 (1.22)	4.29 (1.48)	.44***	-.28*	-	.04	-.02	-.19	.05
4. Feminine objects preference	3.06 (1.54)	2.98 (1.62)	.19	.15	.13	-	.59***	-.19	.05
5. After-choice self-ascribed femininity	5.14 (1.11)	5.20 (1.10)	.15	.03	-.04	.30*	-	-.13	-.02
6. Participants' Age	34.73 (12.88)	35.05 (11.63)	-.10	-.10	-.15	-.26*	-.17	-	.04
7. Participants' BMI	22.94 (3.96)	22.14 (5.49)	.12	-.08	-.01	.01	.19	.22	-

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Correlations are reported by condition: control condition on the bottom and overeating condition on top half of the matrix respectively.

8.3. Overeating and perceived femininity of the imagined eating behavior

The one-way ANOVA carried out on the perception of the feminine eating behavior—including eating condition as a factor and age as a covariate—confirmed Hypothesis 1: women in the large portion condition considered their eating behavior as less feminine than those in the normal portion condition, $F(1, 120) = 9.14, p = .003, \eta^2 = .07$ (see Table 4). Also, age exerted an influence of the dependent variable, $F(1, 120) = 5.12, p = .026, \eta^2 = .04$.

8.4. Overeating and emotions

A MANOVA performed on the negative and positive emotions revealed a marginally significant multivariate main effect of the eating condition, Wilks' $\lambda = .95, F(2, 120) = 2.98, p = .055, \eta^2 = .05$. The univariate effects were examined: For negative emotions, a significant univariate main effect was obtained for the eating condition, $F(1, 121) = 5.19, p = .025, \eta^2 = .04$. Participants did not express strong negative emotions; nevertheless, they felt worse in the large portion condition than in the normal portion condition. The same analysis on the positive emotion index did not reveal significant differences between the two eating conditions, $F(1, 121) = .003, p = .956$, (see Table 4).

8.5. Overeating and the preference for feminine objects

The univariate ANOVA performed on the preference for feminine objects, including the eating condition as a factor and age as a covariate, did not show the effect of the eating conditions on preference for feminine objects, $F(1, 122) = .06, p = .806$. Contrary to our expectations, women in the large portion condition did not exhibit a stronger preference for feminine objects compared to women in the normal portion condition (see Table 4). The analysis revealed a significant effect of age on the preference for feminine objects, $F(1, 120) = 6.41, p = .013, \eta^2 = .05$.

8.6. After-choice self-ascribed femininity

The analysis of variance on the after choice self-ascription of femininity did not reveal a significant difference between the overeating and the normal portion conditions, $F(1, 122) = .11, p = .742$ (see Table 4). This result is in line with our expectations because the possibility of choosing feminine objects should have helped women in the large portion condition (vs. a normal portion condition) to restore their feminine self-image so that it is on par with those whose feminine self-image was not threatened (i.e., those in the normal portion condition).

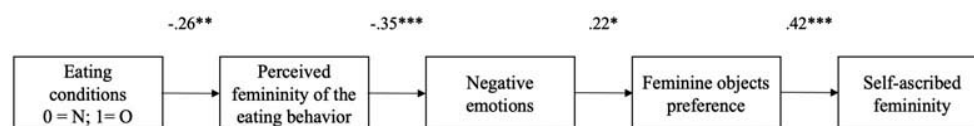
8.7. Indirect effects of overeating on preference for feminine objects

To test Hypothesis 2, we verified a three-step model in which the large portion condition weakens the perception of behaving in a stereotypical way, which in turn increases negative emotions about the eating experience that then increases the likelihood of preferring feminine wearable objects. To this end, we ran Model 6 of PROCESS, setting 5,000 bootstrapped re-samples. This analysis allowed to test three indirect paths: the first included only the perception of stereotypical behavior as the intermediate factor; the second included only negative emotions as the intermediate mediating factor; the third included the complete sequence depicted in Figure 3. We included age as a covariate. Overeating was coded 1 and compared to the normal eating condition (coded 0). As hypothesized, only the model including the complete sequence of factors (indirect effect = .061, $SE = .040$; 95% CI [.012, .189], $R^2 = .09, F(4, 118) = 3.05, p = .020$) was significant. All the path coefficients in the model were significant.

The same Model 6 regression analysis was conducted to test Hypothesis 3 (for three mediators). Specifically, we verified a four-step model in which overeating weakens the perception of behaving

Figure 3. The final model (Study 2).

Note. Path coefficients are b coefficients * $p < .05$; ** $p < .01$; *** $p < .001$



in a stereotypical way, which in turn increases negative emotions about the eating experience that increase the likelihood of preferring feminine wearing objects that then positively influences the after choice self-ascribed femininity (see Figure 3).

As hypothesized, only the model including the complete sequence of factors, indirect effect = .018, $SE = .012$; 95% CI [.004, .061], $R^2 = .21$, $F(5, 117) = 6.05$, $p < .001$, was significant. Also, in this case, all the path coefficients in the model were significant. The model revealed that the preference for feminine wearing objects improved self-ascribed femininity.

9. General discussion

Our findings converged in showing that, for women, overeating induces compensatory consequences that go beyond the food domain. As a counter-stereotypical behavior for women, overeating activates the need to restore gender identity. We showed that this could be done through the choice of other stereotypical feminine activities or objects.

Indeed, women recalling an episode of overeating or even an imagined episode of overindulging in food experienced stronger negative emotions than women recalling or imagining a situation in which they were able to control their food ingestion. In Study 1, we found that these negative emotions led women, but not men, to prefer stereotypically feminine movies (i.e., romance movies). We interpreted this result as a means of contrasting the negative emotional consequences of behavior that violated the feminine-specific “eating lightly” social norm. However, we had to be cautious about interpreting this relationship, as we did not directly assess if recalling an overeating episode influenced women’s perception of femininity. Moreover, we did not verify if choosing a gender-congruent movie succeeded in improving participants’ self-image of femininity. Finally, we investigated one kind of stereotyped (vs. non-stereotyped) activity, which is the preference for romance movies. Therefore, this was not enough to generalize this process to other feminine activities.

Study 2 was conducted to overcome these limitations by showing that overeating is a gender-nonconforming behavior for women because it violates the social norm dictating that women should eat lightly to be feminine and socially desirable (Pliner & Chaiken, 1990). The awareness of this social norm led women to judge overeating as lower in femininity than eating normally. This gender nonconforming behavior elicited negative emotions that in turn propelled women’s desires to see themselves in a more feminine way by preferring feminine objects to wear.

The pressure of the implicit “eating lightly” social norm is so deeply rooted in women’s lives that to imagine overindulging in food is enough to induce adverse feelings. Moreover, Study 2 showed that the choice of gender-congruent objects helped women to restore a feminine self-image.

These results are in line with the Cognitive Dissonance Theory (e.g., Festinger, 1957) and the Balance Theory (e.g., Heider, 1958), according to which people feel uncomfortable when their cognitions are in contrast with their behavior and therefore are motivated to resolve this discomfort. The preference for feminine movies and objects indeed represents a way to reduce the inconsistency between the feminine “eating lightly” norm and female participants’ recollected (in Study 1) and imagined (in Study 2) overeating behavior.

It is worth noting that, different from previous studies about strategic food regulation, mainly including student participants, our sample included participants of a wide age range. This choice was made because it was important that our participants, particularly in Study 1, could easily remember an eating out experience. According to some Italian field studies, the frequency of dining out increases with age. In particular, people that considered eating in a restaurant as a relatively common experience were between the ages of 35 and 44 (FIPE, 2015). In addition, using a heterogeneous sample allowed us to overcome the student sample bias and thus to increase the generalizability of our results. Moreover, several studies have found that older women display disordered eating (Midlarsky & Nitzburg, 2008) and are influenced by sociocultural

standards of body image and pressures toward thinness (Lewis & Cachelin, 2001) as are younger women. Women's body dissatisfaction persists across the lifespan (Peat, Peyrel, & Muehlenkamp, 2008). However, as the preferences for feminine objects were correlated with age, we controlled for this aspect in our analyses.

Some limitations need to be mentioned, as they could open new avenues for research. Although the studies were conducted in Italy, where the importance of food and the convivial function of eating is particularly relevant (Cavazza, 2008), we believe that these results might not be limited to this particular social context. Indeed, the rates of restrained eating, body dissatisfaction, and social pressure resulting from the standards of female beauty imposed by the culture are common in Western countries and are growing in some non-Western countries like Japan (Makino, Tsuboi, & Dennerstein, 2004; Nasser, Katzman, & Gordon, 2003). It seems that the connection between food and femininity is a common feature in many backgrounds, except for those where hunger and food insecurity are major problems. Further studies in different cultures could verify this point.

Moreover, the sample—recruited through virtual networks via a snowball sampling approach—is not representative of the Italian population. We are aware that this collection method could have affected the results.

Furthermore, as we considered only two stereotyped activities (i.e., the desire to watch romance movies and the desire to wear feminine objects), further studies may verify whether this process could apply to other gender-stereotypical behaviors.

Notwithstanding these limitations, our results converge with those of Sheikh et al. (2013) in indicating that failing to control food intake entails psychological and behavioral consequences that might go beyond the food domain. Moreover, these results contribute to the understanding of overeating as an identity-relevant behavior which is able to generate psychological consequences in relation to implicit social norms, beyond the best-known health consequences.

Previous studies have clarified that food choice may be used as a tool for identity expression and impression management, but our study showed that it may become, for the same reasons, a source of a potential threat that people (especially women) must deal with.

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Competing interest

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Notes

1. Since overeating in romantic and business dinners could be more threatening than the other types of

dinners for impression management motivations, we conducted all the analyses only with participants who recalled family and convivial dinners. The exclusion of business and romantic dinners did not change the pattern of results.

2. We conducted a univariate ANOVA including the two independent variables (eating condition and participants' gender) performed on the desire to watch romance movies without the control variables (participants' age and the number of female adult co-eaters). The results showed the main effect of gender, $F(1, 106) = 48.89, p < .001, \eta^2 = .32$. In addition, the analysis revealed a marginally significant interaction effect, $F(1, 106) = 3.61, p = .060, \eta^2 = .03$.

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