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Food as a way to convey masculinities: How conformity to hegemonic masculinity
norms influences men's and women's food consumption

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Abstract

This study investigated how conformity to hegemonic masculinity norms affects men's and women's food consumption and whether such influence was contextually modulated. 519 individuals (65% women; $M=44$ years old) participated in a 2 (Gender salience: low vs. high) x 2 (Participants' Sex: male vs. female) quasi-experimental between-subjects design, completing the Conformity to Masculinity Norms Inventory (Portuguese version) and reporting their past week's food consumption. Gender salience moderated the relation between men's conformity to masculinity norms and food consumption; sex-related differences in food consumption were partially mediated by conformity to masculinity norms. Implications for food consumption interventions are discussed.

Keywords: eating behaviour, gender, health psychology, norms, social interaction

Introduction

Noncommunicable diseases are chronic, non-transmissible illnesses, responsible for 68% of all deaths worldwide in 2012, a number expected to increase if prevention measures are not followed (WHO, 2016). Despite this, noncommunicable diseases are largely preventable, as their main risk factors are behaviours such as tobacco and harmful alcohol use, physical inactivity and unhealthy diets.

This last risk factor includes both high consumption of red and processed meat, and low fruit and vegetable intake (WHO, 2003). Meat consumption has been increasing and it will likely keep on increasing in the future (Henchion, McCarthy, Resconi, & Troy, 2014; Sans & Combris, 2015). Conversely, the median individual intake of fruits and vegetables is most often below the recommended 400 grams, across different countries (Boffetta et al., 2010; Hall, et al., 2009). These food consumption patterns have a great impact on health; according to Robertson et al. (2004), such inadequate eating habits are one of the leading causes of healthy years lost, responsible for 4.6% of the burden of disease in Europe. Given the impact of food consumption patterns on health, it becomes important to study the factors that influence their adoption. Consequently, the aim of the present study was to expand the knowledge on the psychosocial correlates of food intake, namely, how sex and gender are associated with meat and fruit/vegetable consumption.

Sex is a descriptive marker used to categorize human beings into males and females according to their (often-inferred) biological characteristics (e.g., genitalia, secondary characteristics, chromosomes; e.g., Unger, 1979; Unger & Crawford, 1993; West & Zimmerman, 1987). Evidence shows sex-related differences in quality and quantity of food intake. As compared to women, men have a greater tendency to eat more red meat (Micha et al., 2015) and less fruits/vegetables (Boffetta et al., 2010). Also, generally men eat more than women (Beer-Borst, 2000) and need a greater amount of calories since they are, on average, larger and have more musculature than women (Rolls, Fedoroff, & Guthrie, 1991). However, studies have shown that individuals' sex is a greater predictor of daily intake than their weight and height (De Castro, 1995), suggesting that these sex-related differences are not exclusively explained by physiological factors, namely, individuals' body size. Indeed, men's and women's food consumption patterns may also be influenced by gender, i.e., socially constructed meanings associated with being and acting as a man or a woman in a certain

society (Deaux & Major, 1987; West & Zimmerman, 1987). This paper generally aimed at investigating the influence of gender, and more specifically, the influence of gender stereotypes and respective norms, on men's and women's meat and fruit/vegetables consumption patterns.

Gender stereotypes, norms and food consumption

Gender stereotypes are socially constructed and generalized preconceptions about typical masculinity and femininity, i.e., the roles and characteristics typically associated to males and females, respectively (Bussey & Bandura, 1999; McCreary & Chrisler, 2010). Gender stereotypes can condition individuals' behaviours since these often include strong and clear social norms regarding how men and women should be and behave (Barreto & Ellemers, 2013). According to the Focus Theory of Normative Conduct (Cialdini, Kallgren, & Reno, 1991), such gender norms, as all other social norms, can be descriptive or prescriptive. Descriptive gender norms define how women and men generally are and/or behave (e.g., "men are stronger than women"), while prescriptive gender norms prescribe how women and men should or should not be or behave, what is acceptable or condoned behaviour (e.g., "women should be good mothers").

Are there any gender norms regarding food intake? Although not many studies have addressed this question, some evidence begins to uncover the links between gender stereotypes, norms and eating patterns. Some studies suggest that red meat consumption is associated with stereotypical masculinity, while fruits and vegetables are linked to femininity (Ruby, 2012; Wardle et al., 2004). For example, Kimura et al. (2009) found that desserts, fruit and salads were associated with a female forename, while meat dishes were associated with a male forename. Bock and Kanarek (1995) showed that individuals eating a small meal were rated as more typically feminine and less typically masculine than targets who ate larger meals. Also, female targets who ate smaller, typically feminine foods were considered more socially appealing (Basow and Kobrynowicz, 1993). Stein & Nemeroff (1995) presented a fictional target's preferred foods – either "fruit, salad, whole-wheat bread, chicken and potatoes", or "steak, hamburgers, French fries, doughnuts, and ice cream sundaes"; independently of the type of food, when eaten by a male target, it was rated as healthier and lower in fat than when it was eaten by a female target. The authors read this finding in light of the stereotype of male body's invulnerability, implying that a man's body is sturdy enough

to endure unhealthy food habits. In sum, these studies showed that stereotypical masculinity is associated with meat consumption and large quantities of food intake, and stereotypical femininity is associated with small, lighter meals and fruit/vegetable consumption. Such gender norms not only convey gendered representations of food but also influence our perceptions of others masculinity and femininity according to the content and size of their meals.

But do these norms influence men's and women's eating behaviors? Gender norms should be considered a continuum in which individuals position themselves; individuals may present various degrees of conformity to gender norms as gender is not static but continually constructed (Amâncio, 1993; Diekmann & Goodfriend, 2006). Moreover, according to Deaux and Major's (1987) model of gender-in-context, gender is acted within social interactions and, hence, gender-related behaviours are determined by contextual cues (Deaux & Major, 1987; Deaux & LaFrance, 1997). More specifically, concern for one's self presentation in a situation where gender is made salient may motivate individuals to behave in ways congruent with the stereotypes and norms associated with the gender one identifies with. Indeed, a few studies have shown that women, when paired with a desirable male partner, eat less to look more feminine; conversely, men eat more in the presence of other men, arguably due to a motivation for competition (Conner & Armitage, 2002). These studies indirectly suggest the influence of gendered impression-management goals on food intake (Herman, Roth and Polivy, 2003): the use of food (and the manipulation of food intake) to convey a specific (gendered) impression about ourselves in situations where gender is salient. However, to the best of our knowledge, no studies have directly investigated the extent to which individuals' conformity to gender norms influences their food intake nor whether such influences are dependent on the contextual gender salience. This paper generally aimed to bridge this gap by specifically focusing on a particular set of gender norms – hegemonic masculinity norms (Connell & Messerschmidt, 2005).

Hegemonic masculinity refers to the culturally dominant ideal of masculinity; while the majority of men do not fully adhere to this ideal, they are socially pressured to position themselves against this standard, that conceives the ideal man as heterosexual “play-boy”, stoic, competitive, dominant, aggressive, risk-taker, independent, physically strong and invincible, capable of overpowering women and other men (Connell & Messerschmidt, 2005; Good, Sherrod & Dillon, 2000). Conformity to hegemonic masculinity norms have been shown to bear strong detrimental effects on individuals'

(especially men's) health. Adherence to these ideals is generally associated to increased risk behaviors (e.g., substance abuse, unprotected sexual intercourses, reckless driving), a greater reluctance in seeking help from health-care services and engage in health-protective behaviors (e.g., doing screenings test, using sun-block; Courtenay, 2000, de Souza and Ciclitira, 2005; Good, Sherrod & Dillon, 2000; Lee & Owens, 2002). To the best of our knowledge, no studies have yet analysed the relationship between individuals' conformity to hegemonic masculinity norms and food consumption patterns.

Aims and Hypotheses

In the present study, we intended to bridge this gap in the literature by investigating the association between individual's conformity to masculinity norms and their meat and fruit/vegetable consumption. Drawing upon the gender in context model (Deaux & LaFrance, 1998; Deaux & Major, 1987) and the Focus Theory of Normative Conduct (Cialdini, Kallgren, & Reno, 1991), we first aimed to investigate the extent to which contextual gender salience moderated the relation between the conformity to hegemonic masculinity norms and food consumption. We predicted that when gender was contextually salient (vs. not salient) conformity to masculinity norms would show a stronger positive association with meat consumption (Hypothesis 1.1.) and a stronger negative association with fruit and vegetables consumption (Hypothesis 1.2).

Although when studying masculinities, most authors have focused solely on men (Levant, Hall, et al., 2015; Mahalik et al., 2003; Parent & Morandi, 2011), we wanted to test our previous hypotheses in men and women. Indeed, we agree with Owen (2011) in that neglecting to study the influence of masculinity norms on women who may conform to them leads to a failure in acknowledging the differences between sex and gender, implying that being male is the sole predictor of conformity to masculinity norms. As such, exploring how women's conformity to masculinity norms influenced their food intake would be an innovative contribution to the literature. However, given the exploratory nature of this part of the study, we did not know if the hypotheses posited for men could be generalised to women.

Finally, we further intended to investigate whether the conformity to masculinity norms was a mediating mechanism of sex-related differences in food consumption. In line with previous studies (Ruby, 2012; Shiferaw, Verrill, Booth, Zansky, Norton, Crim, & Henao, 2012), we expected that: (1) men would report eating less vegetables/fruit and more meat than women (hypothesis 2.1); (2) men would show higher levels of

conformity to hegemonic masculinity norms than women (hypothesis 2.2), finally, (3) conformity to masculinity norms would account for sex-related differences in food consumption (hypothesis 2.2).

Method

Participants

An online questionnaire was accessed by 934 individuals; however, 394 participants (42.18%) dropped out before total completion. Therefore, only the completed questionnaires were considered. The length of the protocol might have partially accounted for the dropouts, especially considering that many participants received the invite to participate in their workplaces. The dropout rate was, however, similar to rate found in previous studies concerning food consumption (Graça, Oliveira, & Calheiros, 2015).

Data on participants with dietary restrictions relevant to this study (vegetarianism, no meat and/or processed meat consumption) were removed from the sample ($n = 16$ individuals, 2.96% of the total sample, 4 men and 12 women). The final sample consisted of 519 individuals (64.93% women), ranging in age from 17 to 68 years old ($M = 43.70$; $SD = 10.63$; see Table 1). Many respondents lived in Lisbon metropolitan area (38.54%), whilst the others were unevenly spread across the country. Around one third (33.91%) had education below the university level, and the remaining 66.09% had higher education degrees. Most participants (63.78%) were married or were part of an unmarried couple, and 89.60% were employed. Sex-related differences in the education level were observed ($\chi^2_{(7)} = 17.58$; $p = 0.01$), with more women than men reported having higher education degrees (68.5% vs. 61.5%).

Table 1- Participants' socio-demographic characteristics

Demographic characteristics	Number / Proportion of the sample <i>n</i> (%)
Gender	
Female	337 (64.9%)
Male	182 (35.1%)
Age	
17-29 years	56 (10.8%)
30-39 years	115 (22.2%)
40-49 years	174 (33.5%)
50-59 years	147 (28.3%)
60-68 years	26 (5.0%)
Marital status	
Single	114 (22.0%)
Part of an unmarried couple	59 (11.4%)
Married	272 (52.4%)
Separated but still legally married	3 (0.6%)
Divorced	67 (12.9%)
Widowed	4 (0.8%)
Geographical distribution	
North	77 (14.8%)
Centre	166 (32.0%)
Lisbon	200 (38.5%)
Alentejo	20 (3.9%)
Algarve	36 (6.9%)
Autonomous Region of Madeira	17 (3.3%)
Autonomous Region of the Azores	3 (0.6%)
Highest qualification	
Second cycle	1 (0.2%)
Third cycle	20 (3.9%)
Secondary education	133 (25.6%)
Higher secondary education	22 (4.2%)
Bachelor's degree	19 (3.7%)
Licenciate's degree	237 (45.7%)
Master's degree	70 (13.5%)
Doctor's degree	17 (3.3%)
Occupation	
Student	26 (5.0%)
Owner/Employer	6 (1.2%)
Self-employed	12 (2.3%)
Employee	447 (86.1%)
Other	28 (5.4%)

Design and Gender Salience Manipulation

This study consisted of a 2 (Gender salience: low vs high) x 2 (Participants' Sex: male vs. female) quasi-experimental between-subjects design.

Gender salience was manipulated by stating, after the first part of the questionnaire, “You have now finished the first part of the questionnaire, which was intended to evaluate your masculinity/femininity score. Please proceed to the second part.” In the low salience condition, the message shown was “You have now finished the first part of the questionnaire, which was intended to evaluate your attitudes and values. Please proceed to the second part.” Respondents were randomly assigned to the gender salience conditions. There were no statistically significant differences between participants assigned to the two conditions in relation to the sociodemographic variables.

At the end of the questionnaire, two questions were included as manipulation checks; the first question was “To what extent did you feel that your masculinity/femininity was being assessed in this study?”, measured in a scale of 1 (“Not at all”) to 7 (“Completely”). The second question was “To what extent did this questionnaire make you think about your masculinity/femininity?”, rated on a scale of 5 points (from “Not at all” to “A lot”).

Instruments

Conformity to Hegemonic Masculinity Norms. A shortened version of the Conformity to Masculinity Norms Inventory (CMNI; Mahalik et al., 2003; validated to the Portuguese population by Leitão, 2016) was used to evaluate respondents’ conformity to hegemonic masculinity norms.

This shortened version contains seven subscales – Winning, Dominance, Risk-taking, Disdain for Homosexuals, Violence, Pursuit of status, and Playboy. The total number of items was 14, with two items per subscale (five of which had reversed scoring). Participants were asked to rate, on a Likert scale of 1 (“Strongly disagree”) to 4 (“Strongly agree”), how much they agreed with each of the items.

In order to examine the validity of the scale’s items in our sample, a principal axis factoring analysis with orthogonal rotation was performed with the 14 items in the present sample. In the final solution, six items in total (corresponding to three subscales) were removed, due to their low saturation and/or high cross loadings (differences between factor loading below 0.30). Four factors were extracted using the Kaiser criterion, accounting for 56.87% of the variance: Playboy/Playgirl (e.g., “I would feel good if I had many sexual partners”), Disdain for Homosexuals (e.g., “It would be horrible if someone thought I was gay”), Risk-taking (e.g., “I like taking risks”) and

Violence (e.g., “Sometimes, violent action is necessary”). All factors presented acceptable internal consistency, given the exploratory nature of the study (Hair, Black, Babin, Anderson & Tatham, 1998) (Playboy/Playgirl: $r_{(S-B)} = 0.76$ in the men’s sample, and $r_{(S-B)} = 0.66$ in the women’s sample; Disdain for Homosexuals: $r_{(S-B)} = 0.74$ in the men’s sample, and $r_{(S-B)} = 0.70$ in the women’s sample; Risk-Taking: $r_{(S-B)} = 0.62$ in the men’s sample, and $r_{(S-B)} = 0.68$ in the women’s sample; Violence: $r_{(S-B)} = 0.72$ in the men’s sample, and $r_{(S-B)} = 0.62$ in the women’s sample). Scores were computed by averaging the two items that compose each factor, with higher scores reflecting greater norm conformity.

Meat intake. To assess meat consumption frequency in a typical week, a question by Hoek, Luning, Weijzen, et al. (2011), adapted by Graça, Calheiros, and Oliveira (2015) to the Portuguese population was included. The question was: “In a typical week, how many times do you eat a piece of red or processed meat?”, and was followed by a description of what should be considered a piece of red or processed meat (a beef or pork palm-sized stake, or two slices of smoked meat, ham or bacon). There were five answering options: “Once a week or less”, “Two to three times *per week*”, “Four to five times *per week*”, “Six to seven times *per week*” and “More than seven times *per week*”.

Fruit and vegetable intake. Respondents’ consumption of fruit and vegetables in a typical week was measured with two questions, one for fruit intake and another for vegetable intake, based on the work of Godinho, Alvarez, Lima and Schwarzer (2014). Instructions were modified so as to consider fruit and vegetable intake in a typical week. It was also mentioned what should be considered as fruit portions (fruit itself and a glass of 100% fruit juice), and vegetable portions (soup, salad or a vegetable side dish, excluding potato). Both fruit and vegetable intake were measured in a seven-point scale, ranging from 1 (“Once a week or less”) to 7 (“More than four times *per day*”). Fruit and vegetable consumption items were recoded to represent daily consumption (i.e., number of daily portions), and treated as metric variables.

Procedure

A questionnaire was built online, using Qualtrics platform. Two non-probabilistic sampling strategies were used to collect the data: a snowball sampling was used, and contacts were made through e-mail to public services, private security

companies, trade unions and senior universities; these entities were asked to distribute the online questionnaire to their collaborators.

The questionnaire was organised in three parts. The first part included the CMNI scale, followed by the gender salience manipulation conditions (i.e., high vs. low), which were randomly displayed, and the third part contained the food consumption measures.

At the beginning of the questionnaire, informed consent was obtained, and information was provided about the general objective of the study; participation was voluntary and confidentiality of the collected data was also guaranteed, following the Institutional Review Board ethical guidelines, as well as the ethical code of the Portuguese Board of Psychologists (Ordem dos Psicólogos Portugueses, 2011). Before beginning the first part, sociodemographic data was collected to adapt the wording of the items to the respondent's sex. After the manipulation check, a final question was included to verify the participants' blindness to the study's objective; five participants were removed from the initial sample, since they had identified what the objective was.

Data Analyses

All analyses were performed using SPSS Statistics 23. First, correlations between the consumption items and sociodemographic variables were analysed, separately for men and women. Given that age was significantly correlated with vegetable consumption in the men's sample, and with meat consumption in the women's sample, it was entered as a covariate in both the moderation and the mediation models.

Descriptive analyses of the dimensions of conformity to masculinity norms and the consumption items were performed and t-tests were conducted to verify if there were sex differences in the dimensions.

Then, the relations between the CMNI dimensions and consumption variables were assessed using Pearson correlations, separately for women and men, as we were interested in exploring the associations between conformity to masculine norms and food consumption in men and women separately. For the men's sample these correlations were also assessed separately for participants in both gender salience conditions. Since gender salience manipulation was not effective for women, the intercorrelations were calculated for the total sample of female participants.

Both the moderation and the mediation models were tested using Hayes (2016) Process Macro for SPSS. In the linear regression analyses used to test the moderation of gender salience on the relation between conformity to masculinity norms and food consumption, the predictor was centered, and the interaction term was constructed by multiplying it by the condition variable. The centered variable, the interaction term and gender salience were then entered as predictors of meat, fruit and vegetable consumption, separately. Twelve moderation models were tested for the men's sample only, as the gender manipulation was not effective on the women's sample. Since age was significantly correlated to men's vegetable consumption, it was entered as covariate in the analyses of that particular model.

To examine whether conformity to masculinity norms (i.e., Playboy, Disdain for homosexuals, Risk-taking and Violence) mediated the relation between sex and food intake (i.e., meat, fruit and vegetables consumption), when in the high salience condition, Model 4 of the Process Macro was used; 5000 bootstrap samples were used to test the indirect effects. Twelve mediation analyses were performed. Age was entered as a covariate in all mediation models concerning vegetable and meat consumption.

Results

Dropout analysis

There were no statistically significant differences (all $p > 0.05$) between those who completed the questionnaire and those who dropped out (all $p > 0.05$), in relation to sociodemographic variables (sex, age, marital status, region, level of education, employment status and dietary restrictions).

Manipulation Check

In the men's sample, there were statistically significant differences in the first manipulation check question ($t_{(180)} = -2.35$; $p = 0.02$), with the high salience group presenting a higher sense that their masculinity and femininity had been evaluated ($M = 3.57$; $SD = 1.26$) than the low salience group ($M = 3.11$; $SD = 1.34$). There were also statistically significant differences in the second manipulation check question ($t_{(180)} = -2.12$; $p = 0.04$), with the high salience group showing a higher level of thought about their masculinity and femininity ($M = 2.40$; $SD = 1.10$) than the low salience group ($M = 2.05$, $SD = 1.16$). In the women's sample, however, there were no significant differences between the two conditions, both in the first ($t_{(335)} = -1.04$, $p = 0.30$) and the second

question ($t_{(335)} = -1.15, p = 0.25$). Since there was no evidence that the manipulation of gender salience was effective for women, we have only tested the moderation hypothesis for men.

Sex-related Differences in Conformity to Masculinity Norms and Food Consumption

Regarding the conformity to masculinity norms, all dimensions had the same range of answers, varying from 1 to 4. As it can be seen in Table 2, the Disdain for Homosexuals and the Risk-taking factors had the highest mean values for men and women; participants somewhat agreed with those norms. The lowest mean value was registered for the Playboy/Playgirl dimension, meaning that on average participants did not particularly conform with this norm.

As for the meat consumption, participants' answers varied between all answer options, from 1 ("Once a week or less") to 5 ("More than seven times *per week*"), with a modal value of 2 (corresponding to "Two to three times *per week*"). Regarding fruit and vegetable consumptions, all answer options were chosen in both questions, and varied from 0 ("Does not consume daily") to 5 ("More than four times a day"). Fruit consumption had a modal value of 2 (which represented "Twice a day"); vegetable consumption had a modal value of 1 (meaning that most participants chose the option "Once a day").

Table 2 shows sex-related differences in both the CMNI dimensions and food consumptions items. Men presented higher mean values of conformity to masculinity norms in all four factors. Men also had a significantly higher mean of meat consumption than women, who presented a higher mean value of daily frequency of consumption, both for fruit and vegetables than did men.

Table 2. Sex-related differences in conformity to masculinity norms and food consumption: Means, standard deviations and t-tests

		Sex		
		Men	Women	
		Mean (SD)	Mean (SD)	t-test
Masculinity norms	Playboy/Playgirl	2.01 (0.62)	1.41 (0.52)	-11.53*
	Disdain for Homosexuals	2.40 (0.73)	2.16 (0.66)	-3.84*
	Risk-taking	2.46 (0.54)	2.12 (0.55)	-6.64*
	Violence	2.18 (0.76)	1.80 (0.67)	-5.68*
Food consumption	Meat consumption	2.35 (0.96)	2.08 (0.98)	-3.08*
	Fruit consumption	1.48 (1.33)	1.99 (1.25)	4.30*
	Vegetable consumption	1.11 (1.28)	1.64 (1.22)	4.60*

* $p < 0.01$.

Correlations between conformity to masculinity norms and food consumption

In the men's sample, the only significant correlation was found between vegetable consumption and the conformity to the Playboy norm, but only for men in the high gender salience condition ($r_{(95)} = -0.24$; $p = 0.02$). For these men, the more they conformed to the Playboy norm the less they reported eating vegetables.

As for women, meat consumption had a significant positive association with the conformity to Violence norm ($r_{(337)} = 0.20$; $p < 0.01$), i.e., the more women conformed to the Violence norm the more they reported eating meat.

No significant results were found for the Disdain for Homosexuals and the Risk-taking dimensions.

Moderation analysis

The only model that produced significant effects was the moderation of gender salience on the relation between the conformity to the Playboy norm and vegetable consumption. Conformity to the Playboy norm and gender salience were entered as predictors of vegetable consumption, as well as their interaction term. This model accounted for 7.16% ($R^2_{\text{adjusted}} = 0.07$; $F_{(4, 176)} = 3.39$, $p = 0.01$) of the variance of vegetable consumption. Neither the Playboy norm ($b = 0.12$; $SE = 0.20$; $t = 0.60$; $p =$

0.55; CI = [-0.28; 0.52]) nor the gender salience ($b = 0.40$; $SE = 0.22$; $t = 1.82$; $p = 0.07$; $CI = [-0.34; 0.84]$) alone were predictors of vegetable consumption; however, their interaction regression coefficient was negative and significant ($b = -0.67$; $SE = 0.30$; $t = -2.20$; $p = 0.03$; $CI = [-1.27; -0.07]$), and explained 3% of the variance of vegetable consumption ($R^2_{\text{adjusted}} = 0.03$; $F_{(1, 176)} = 4.83$, $p = 0.03$). When in the high salience condition, men who have a higher level of conformity to the Playboy norm report less vegetable consumption ($b = -0.55$; $t = -2.41$; $p = 0.02$; $CI = [-1.00; -0.10]$). Whereas, in the low salience condition this relationship was no longer significant ($b = 0.12$; $t = 0.60$; $p = 0.55$; 95% $CI = [-0.28; 0.52]$) (Figure 1).

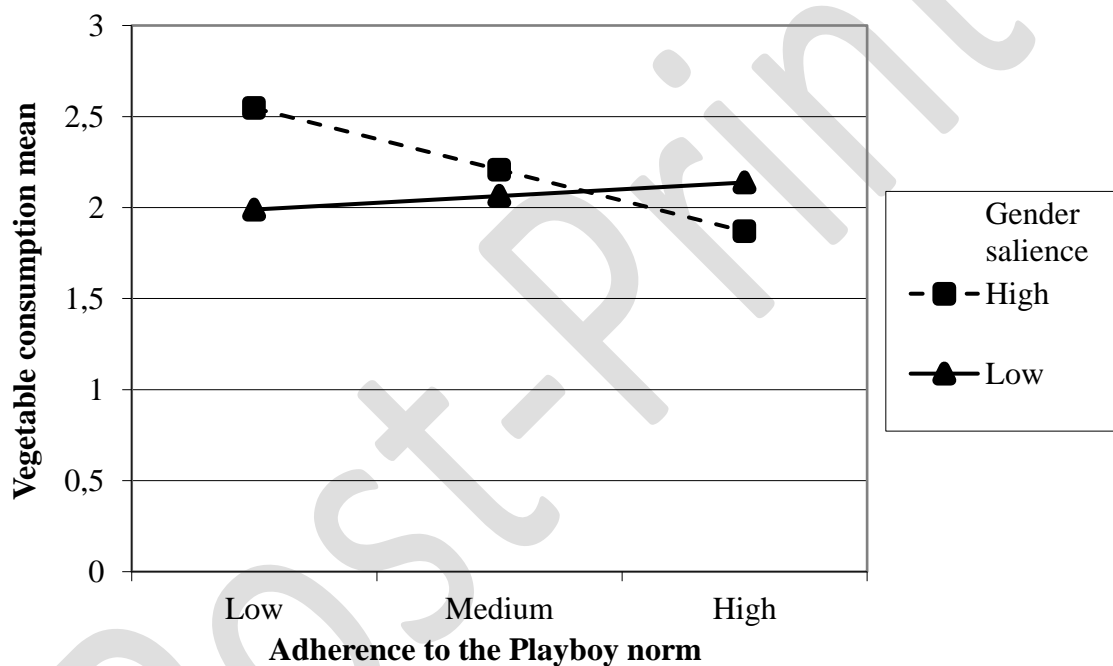


Figure 1. Moderation of gender salience on the relation between conformity to the playboy norm and vegetable consumption.

Mediation analysis

The effect of sex on meat intake $b_{\text{total effect}} = 0.34$, $p < 0.01$, was found to be partially mediated to the conformity to Violence norm, $b_{\text{indirect effect}} = 0.09$, 95% $CI [0.02; 0.19]$, as the direct effect remained significant $b_{\text{direct effect}} = 0.26$, $p = 0.04$. This model was significant ($R^2_{\text{adjusted}} = 0.07$; $F_{(3, 254)} = 6.49$, $p < 0.01$), and is presented in Figure 2. None of the other tested mediation models were significant.

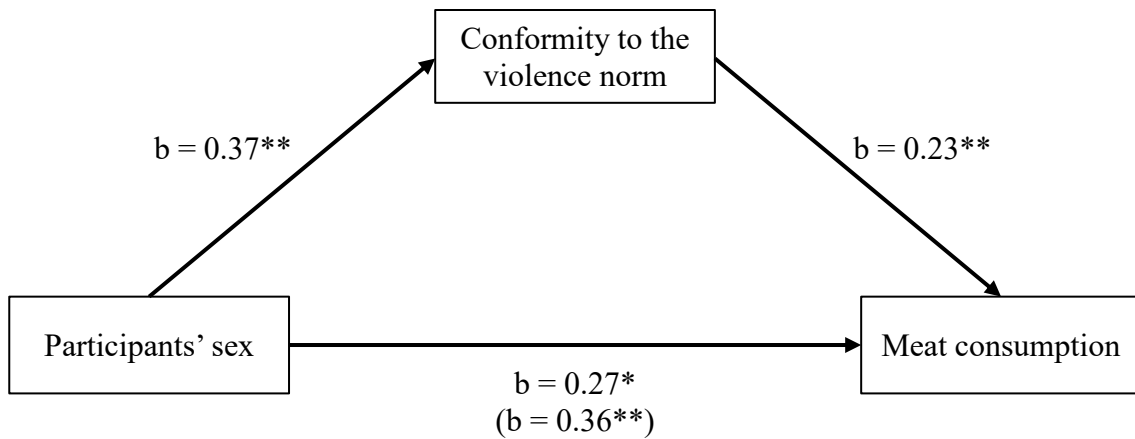


Figure 2. Sex-related differences in meat consumption are mediated by conformity to violence norms.

Discussion

This study had the general purpose of examining the role of hegemonic masculinity norms in food consumption. Particularly, we aimed to investigate the association between the men's and women's conformity to masculinity norms and meat and fruit/vegetable consumption, and if this association was influenced by contextual gender salience. We also intended to investigate whether the conformity to masculinity norms would account for sex-related differences in food consumption.

We hypothesised that, when gender was contextually salient (vs. not salient), the relation between the conformity to masculinity norms and meat and fruit/vegetables consumption would be stronger, i.e., higher conformity to masculinity norms would be more strongly associated with more frequent meat consumption (Hypothesis 1.1) and lower intake of fruits and vegetables (Hypothesis 1.2). As expected, and in line with the gender-in-context model (Deaux & LaFrance, 1998; Deaux & Major, 1987), when gender was salient, men who had higher levels of conformity to the Playboy norm reported significantly lower vegetable consumption; this relation did not hold when gender was not contextually salient. These findings partially support hypothesis 1.2. and suggest that the relation between the conformity to (some) masculinity norms and food consumption is not constant, but context-dependent. Relating this result with the literature on impression-management goals in food consumption, these findings suggest that among men who conform with the Playboy norm, gender salience may play a role in food choice; in contexts where it is important to convey an impression congruent with the masculinity stereotype, men may distance themselves from foods typically associated to femininity, as is the case of vegetables (Baker & Wardle, 2003). The

reason as to why we could not support hypothesis 1.1., regarding meat intake could be related to the fact that meat is the prevalent protein in men's diet, instead of fish or other plant-based protein sources (Prättälä et al., 2007); in the Portuguese population, men have a greater refusal of following a plant-based diet (Graça, Oliveira, & Calheiros, 2015) which translates to meat being the predominant food in the main meal of men (81,5% of the main meals) as compared to fish (44,5% of the main meals). These data suggest that, for men, meat consumption is a regular habit, rather than a behaviour dependent on context cues.

No significant results were found concerning the influence of gender salience on the effects of the remaining three dimensions of masculinity norms present in the study (Disdain for Homosexuals, Risk-taking and Violence) on food consumption. First, as regards the Disdain for Homosexual norms, these results may suggest that participants who conformed more to this norm felt no need to assert their sexuality through their food intake report, which would explain the lack of results concerning this dimension. Indeed, this norm has been linked to greater reluctance to seek psychological help, but not linked to physical health outcomes (Mahalik et al., 2003). However, it was expected that the risk-taking norm would have a greater impact on food consumption report (e.g., higher meat intake), since this norm has been related to health-risk behaviours (Mahalik et al., 2003). Even so, recent literature reports mixed results on the effects of conformity to risk-taking norm on health: it was found to be positively related to health promoting behaviours (Gerdes & Levant, 2017) and negatively related to proper use of healthcare services (Levant, Wimer, & Williams, 2011). Thus, further analysis of the effects of conformity to this norm on health and its mediating mechanisms would be helpful in future studies on masculinity norms and health. Lastly, the violence norm may have not presented significant influence on reported food consumption in the men's sample due to the relatively low mean of conformity to this norm. Despite the fact that violence is much more tolerated among men than women, its mean of conformity is the second lowest of 7 mean value suggesting a floor effect. This floor effect may be accounted for participants' social desirability concerns, as violence is socially frowned upon (Mahalik et al., 2003) and also considering that most questionnaires were distributed in participants' workplaces (Sloan et al., 2014).

Unfortunately, it was not possible to test the effect of gender salience on the relation between conformity to masculinity norms and food consumption among women, since the manipulation of gender salience was not effective with this

subsample. Women may be influenced by the fact that men are viewed as the norm, and women as the exception (Amâncio & Oliveira, 2006), which may make gender more salient, across all social contexts, to women than to men. Thus, our manipulation of gender context may have been not strong enough to elicit (even more) this concept in women; despite the fact that women's answers to the manipulation check questions were higher in the high salience condition, the difference among the two conditions was not statistically significant, which supports our assumption that, for women, gender is salient by default. Nonetheless, in the women's sample, there was a positive correlation between the conformity to the Violence norm and meat consumption; this association seems to hold relevant implications. Since violence is such a non-normative concept for women, the conformity to a traditional masculinity norm, such as the Violence norm, may bring to consciousness the fact that meat is a food traditionally linked to masculinity, and thus heighten its intake report. They may also view meat as a way of expressing their masculinity, by adopting a behaviour typically associated with its norms (Courtenay, 2000). In this way, we can explain the positive association between women's conformity to masculinity norms and their reports of meat consumption. This result also shows that there are differences between women in their degree of conformity to masculinity norms. However, because interventions relating to inadequate eating habits (particularly excess of meat consumption and insufficient fruit and vegetable intake) often do not consider sex, much less gender differences (Carfora, Caso and Conner, 2017; Hawkes et al., 2012; McCahon et al., 2015) in their approach, men and women who conform with masculinity norms may be at a greater risk of health problems arising from these consumption patterns.

In line with the literature on sex-related differences in food consumption (Baker & Wardle, 2003; Roos, Lahelma, Virtanen, et al., 1998), our results showed different consumption patterns between men and women. Indeed, our findings support hypothesis 2.1; while women reported a higher frequency of fruit and vegetable consumption, men reported a higher frequency of meat consumption. Also, supporting hypothesis 2.2., our findings showed sex-related differences in conformity to masculinity norms, with men presenting higher conformity than women to all the norms, which goes in line with other studies' results (Mahalik et al., 2003; Owen, 2011; Leitão, 2015). The greatest differences between men's and women's means of conformity to hegemonic masculinity norms were observed in the Playboy and the Violence norms, which may explain the fact that these two norms presented stronger associations with food

consumption. Furthermore, the Violence dimension was the only norm that mediated the relation between sex and meat consumption. This suggests that, although sex, by itself, is an important predictor of meat consumption, their relation can be partially accounted for by conformity to hegemonic masculinity norms; men's higher meat intake is partially explained by their higher conformity to the masculinity norm of violence. Conversely, women's lower meat consumption can also be accounted for by their lower conformity to the Violence norm.

Even though the Playboy norm significantly correlated with vegetable consumption, its inability to account for sex-related differences in this type of food intake may be explained by the floor effect on women's conformity to this norm, also found in other studies (Cuéllar-Flores, Sánchez-López, & Dresch, 2011; Owen, 2011). The striking sex-related differences in conformity to playboy/girl norm is not surprising, as they reflect the classical sexual double standard (see Reiss, 1967) to some extent still prevalent today (Farvid, Braun and Rowney, 2017).

Finally, it should be noted that no significant results were found regarding fruit consumption. This lack of results could be accounted for by the fact that this food group is vastly present in the Portuguese population's pattern of consumption (fruit is present in 80% of the main meals; INE, 2009). This suggested that, despite the differences found between men's and women's consumption, fruit intake may be a prevalent habit more dependent on factors such as availability than on gender-related factors.

While these results represent an important step in understanding the role of prescriptive gender norms and gender salience in food consumption, there are some limitations to be reckoned. First, results may have been affected by the food consumption measures that asked for past consumption instead of future intentions of consumption. Although self-reports of past consumption are commonly used to measure food intake, have been validated against food frequency questionnaires and dietary biomarkers (Steptoe et al., 2003), and may generally be permeable to participants' desire to portray themselves in a positive way, they may not be as pliant to manipulation as future intention questions. In future studies, it would be important to verify if the role of sex and gender on food intake intentions and/or future eating behaviours.

Second, our gender salience manipulation did not work for women, preventing us to further investigate how gender salience influences women's food intake. A less

subtle manipulation would most likely be needed to have an effect on women. For example, previous studies (Dahl, Vescio, & Weaver, 2015; Rudman & Fairchild, 2004; Weaver & Vescio, 2015) manipulated gender salience by reporting a fictitious rating on a gender scale, or comparing the participant to the prescription of masculinity or femininity. Although the use of these types of manipulations could raise ethical concerns in an online study where the presence of a proper debriefing to avoid any harm to participants could be challenging, future studies could consider the possibility of including such stronger manipulation strategies.

Third, given that this was a correlational study, we cannot interpret these findings as relations of causality between the conformity to masculinity norms and food consumption. Prospective studies would be an asset to investigating gender norms' influence in men's and women's food consumption.

Finally, because there are sex-related differences in body mass index, waist circumference and other body measurements (Deurenberg, Weststrate and Seidell, 1991), body mass index is highly correlated with excessive meat consumption (Fogelholm, Kanerva & Männistö, 2015), it would be important to collect data concerning participants' body measurements and metabolic information, to disentangle these factors from gender-related influences.

Despite the limitations of this study, it represents a first step in understanding how prescriptive masculinity norms affect food consumption, bearing important implications for research and practice. It is vital to broaden the study of food consumption patterns beyond describing differences between men and women. By focusing on the concept of conformity to hegemonic masculinity norms, our findings go beyond mere description of sex-related differences in food intake by identifying potential mediating mechanisms accounting for such differences. Our findings also stress the situational and relational nature of the influence of gender on food consumption patterns. Moreover, by showing that not only men, but also women, vary in their degrees of conformity to masculinity norms, our study meets the call of previous authors (Owen, 2011) by moving research from a binary view of sex/gender and their influence on health-related outcomes.

Finally, our study also has important contributions for practice, namely, on the designing of interventions targeted to promote healthier food consumption patterns. As we have previously stated, interventions to promote adequate eating habits often do not consider sex, much less gender differences (Carfora, Caso and Conner, 2017; Hawkes et

al., 2012; McCahon et al., 2015). Our findings suggest that mainstreaming gender in the development of such programs will allow a more fine-grained analysis of target at-risk populations (e.g., men and women with high levels of conformity to masculinity norms), better tailoring of interventions to their specific needs and, ultimately, increasing interventions' efficacy.

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