Beef it up! How masculinity distorts perceptions of vegan men

Alina Salmen[1], Kristof Dhont[1], & Nadira Faber[2]

[1]School of Psychology, University of Kent

[2]The Oxford Uehiro Centre for Practical Ethics, University of Oxford

Abstract

The idea that "real men eat meat" is prevalent in pop culture, advertising, and public discourse, revealing strong associations between meat and masculinity. However, little is known about the implications of the meat-masculinity connection for prejudice towards vegan men. Drawing on social role theory, we propose that perceiving vegan men as less masculine is associated with greater bias against them and that this association is stronger for those who hold stronger traditional gender role beliefs. Confirming our expectations, Study 1 (*N*=455 UK adults) showed that lower perceived masculinity of vegan men (but not vegan women) was associated with more negative attitudes towards them, and this association was stronger for participants higher in traditional gender role beliefs. Furthermore, two pre-registered experiments demonstrated that an identical male target was perceived as less masculine when introduced as vegan than when introduced as omnivorous in a vignette (Study 2, *N*=217 UK adults) and in a simulated online interaction (Study 3, *N* = 586 UK adults). Lower perception of masculinity was further associated with more negative attitudes and stronger intentions to socially avoid the vegan target, but only among those higher (vs. lower) on traditional gender role beliefs. We discuss how promoting inclusive masculinities could be crucial to reducing or quitting meat consumption among men.

Keywords: masculinity; sexism; veganism; gender roles; meat consumption; prejudice

Gender role expectations prescribe how men and women should behave in myriad aspects of their lives, determining even what they should eat. A prominent example is the idea that "real men eat meat", which is prevalent in pop culture, advertising, and public discourse (e.g., Buerkle, 2009; Rogers, 2008; Rothgerber, 2013). Feminist theorists have also long proposed that meat symbolizes the ideals of dominance, strength, and virility that lie at the core of Western notions of traditional masculinity (Adams, 1990/2015; MacKinnon, 2004). In recent years, these ideas have increasingly been the subject of psychological research, with overwhelming empirical support for the meat-masculinity link (e.g., Cavazza, Guidetti, & Butera, 2015a, 2015b; Love & Sulikowsi, 2018; Rozin, Faith, Hormes, & Wansink, 2012). However, the question of how the belief that meat is manly is also reflected in people's biases towards those who abstain from meat consumption (i.e., vegetarian and vegans, henceforth referred to as veg*ns) has received little attention. Moreover, the role of individual differences in gender role beliefs in the perception of veg*ns has been largely neglected. The present investigation tests directly how masculinity perceptions and gender role beliefs may distort people's evaluations of veg*ns.

Meat and Masculinity

For early humans, meat was highly valued and consumed to gain strength and health, but difficult to find and only enjoyed on rare occasions (Bunn, 1981; Milton, 1999; Smil, 2002). Given that hunting was largely a male domain, men's ability to provide meat likely granted them status and dominance (Chan & Zlatevska, 2019). Further, the supply and processing of meat requires violent and aggressive actions, inherent to the slaughtering and butchering of animals (see also Lupton, 1996). These factors likely contributed to the symbolic value of meat representing status, dominance, and masculinity (Adams, 1990/2015; Allen & Baines, 2002). The association between meat and masculinity has become culturally ingrained in many societies and manifests itself, for example, in food commercials (Buerkle,

2009; Rogers, 2008). A British McDonalds poster advert from 2015, for example, shows a picture of a sausage and bacon sandwich under the slogan “Sausageness, baconness, manliness” (Adams, 2020).

There is also a growing body of empirical evidence demonstrating the meat-masculinity link. A comprehensive investigation by Rozin and colleagues (2012) found that people implicitly and explicitly associate meat more with maleness than femaleness, and rate meat-related words as more masculine than feminine. Other studies showed that people also associate meat with power, virility, and health (Bogueva & Marinova, 2018; Love & Sulikowski, 2018), and that meat-based dishes are perceived as more masculine than vegetarian dishes (Cavazza et al., 2015a, 2015b). Furthermore, in languages that use gendered nouns, “meat” is more often a masculine noun than a feminine noun (Rozin et al., 2012). Taken together, meat is manly in people’s explicit and implicit impressions, their use of language, and in popular media.

The meat-masculinity link is also manifested in the difference between men and women’s consumption patterns. Men tend to consume meat more often, consume larger portions of meat, show stronger attachment to meat than women, and are less likely to follow a veg*n diet than women (Gal & Wilkie, 2010; Graça, Calheiros, & Olivera, 2015; Keller & Siegrist, 2015; Pfeiler & Egloff, 2018; Rosenfeld, 2018; Ruby, 2012; Schösler, de Boer, Boersema, & Aiking, 2015). Given that, in social situations, people actively use their food choices for impression management (Herman, Roth, & Polivy, 2003; Vartanian, 2015) and to affirm their gender identity (e.g., Robinson, Tobias, Shaw, Freedman, & Higgs, 2011), men likely also use meat consumption as a strategy to demonstrate masculinity. Indeed, in an imagined dining situation with a female partner, men who more strongly associated vegetarianism with femininity were more likely to choose a meat dish for themselves and a

vegetarian dish for their partner (Timeo & Suitner, 2019). These findings indicate that men consume meat in part to feel and appear like "real men".

Given the gendered nature of meat consumption, people also make inferences about others' masculinity based on their diet. Indeed, people view both men and women who consume "feminine" foods as more feminine than those who consume "masculine" foods (Chaiken & Pliner, 1987; Mooney & Lorenz, 1997; Mori, Chaiken, & Pliner, 1987; Stein & Nemeroff, 1995). With meat perhaps being perceived as the quintessential masculine food, men refraining from consuming meat should be perceived as less masculine than their meat-eating counterparts. Indeed, an otherwise identical male target person was perceived as less masculine when following a vegan diet as opposed to an omnivorous diet (Ruby & Heine, 2011; Thomas, 2016). Arguably, eating meat is one of the many behaviours necessary for men to be viewed as "real men", and choosing to eschew it strips men of their masculinity (see also Adams, 1990/2015; Rothgerber, 2013; Twigg, 1983). Violating gender role expectations in this way likely comes with aversive consequences for veg*n men. As Carol Adams (1990, p. 138) puts it: "Men who become vegetarians challenge an essential part of the masculine role. They are opting for women's food. How dare they?".

Gender Role Violations and Anti-Vegan Bias

According to Social Role Theory, men and women hold different roles in society. Men's roles are more strongly associated with status and power than women's roles, which are more strongly associated with domestic duties (Eagly & Wood, 1999). Those who do not adhere to these gender role expectations are often subject to bias and prejudice (e.g., Blakemore, 2003; Blashill & Powlishta, 2009). This is particularly true for men, who face harsher reactions to gender role violations than women (David, Grace, & Ryan, 2004; Prentice & Carranza, 2002).

Arguably, veg*nism constitutes a gender role violation for men, rendering them easy targets of anti-vegan prejudice. For instance, men are often confronted with gendered mockery when switching to a veg*n diet (Nath, 2011) and, although anti-veg*n prejudice exists against both veg*n men and women, veg*n men are disliked more than veg*n women (MacInnis & Hodson, 2017). Women also tend to evaluate vegetarian men as less attractive than omnivorous men, in part because they perceive them as less masculine than omnivorous men (Timeo & Suitner, 2019). Along similar lines, qualitative research revealed that men report feeling anger, resentment, and even hatred towards vegetarian men, often as a direct consequence of them ostensibly losing their masculine status. One participant suggested that vegetarian men "[s]hould be prosecuted for their unmanly behaviour", while another called them a "[…] huge disappointment for the rest of the real masculine men" (Bogueva, Marinova, & Gordon, 2020, p. 36). These findings support the idea that veg*n men (relative to omnivorous men) are perceived as less masculine, which in turn is associated with more negative attitudes towards them. However, no published studies have directly tested this idea. Integrating the findings on the meat-masculinity link with the literature on anti-veg*n bias, the current studies move beyond previous research by providing a direct test of the association between masculinity perceptions and attitudes towards veg*n men. Moreover, we expected that the extent to which people endorse gender role beliefs affects how strongly masculinity perceptions are associated with anti-vegan attitudes.

Theoretically, those who hold more egalitarian gender role beliefs should be more lenient towards gender role transgressions, whereas those with more traditional gender role beliefs judge gender role violations more harshly (Deutsch & Saxon, 1998). Supporting this idea, Gaunt (2013) found that those endorsing traditional gender role beliefs rate women and men who conform to gender expectations (i.e., female breadwinners and male homemakers) more positively than non-conforming men and women, while the opposite pattern emerged

for those endorsing egalitarian gender role beliefs. Similarly, traditional gender role beliefs predict negative attitudes towards men who appear to be violating hetero-normative masculine norms, including towards veg*n men (e.g., MacInnis & Hodson, 2015; 2017). However, it is presently unclear how gender role beliefs interact with masculinity perceptions of veg*n men in predicting bias towards veg*n men.

The Present Research

We conducted three studies with heterogeneous samples of omnivores based in the UK to systematically investigate the roles of masculinity perceptions and gender role beliefs in people's biases towards veg*n men. First, we conducted a survey study (Study 1) to test the associations between masculinity perceptions of veg*n men and attitudes towards them, as well as the moderating role of gender role beliefs. Then, we conducted two preregistered experiments, manipulating the diet of a male target person in a vignette study (Study 2) and a simulated online interaction (Study 3) to provide causal evidence that dietary habits (omnivore vs. vegan) impact people's perceptions of masculinity and attitudes towards male vegans. Furthermore, we tested the moderating role of gender role beliefs and also tested the effects for a wider range of evaluative measures, including measures of perceived warmth, social avoidance, and discrimination intentions. In Study 3, we also manipulated the vegan targets' motivation for following a vegan diet and explored the role of perceived empathy of vegan vs. omnivorous men.

We expected that people who perceive veg*n men to be less masculine would hold more negative attitudes towards them and that veg*n men would be perceived as less masculine and evaluated more negatively than omnivorous men. Critically, we hypothesized an interaction effect between masculinity perceptions and gender role beliefs on attitudes towards veg*n men such that especially among those holding more traditional gender role beliefs, perceiving veg*n men as less masculine would be associated with more negative

attitudes towards them, while this association should be weaker among those holding less traditional gender role beliefs.[1]

Study 1

The aim of Study 1 was to test a) whether lower levels of perceived masculinity of veg*n men are related to more negative attitudes towards them and b) whether this association is stronger for those higher (vs. lower) in traditional gender role beliefs. Given that we theorized that a veg*n diet violates traditional gender roles for men, but not for women, perceived masculinity of veg*n women was not expected to be associated with negative attitudes towards them.

Method

Participants and procedure. A community sample of 655 participants was recruited by four undergraduate students in the UK through different social media channels. As we were interested in the attitudes of meat eaters towards vegetarians and vegans, we excluded those who did not identify as omnivores or flexitarians from the analysis, resulting in a final sample size of 455. Of those, 74.1% identified as woman, 25 % as man, 0.7 % as another gender, and 0.2 % selected "Prefer not to say". Participant age ranged from 18 to 83 years with a mean age of 37.47 years (*SD* = 17.07). Sensitivity power analysis in G*Power confirmed that this sample was sufficient in order to detect a small interaction effect between perceived masculinity of male veg*ns and participants' gender role beliefs ($f^2 >= .02$) with 95% power.

After giving their informed consent, participants completed a larger online survey, which included the scales of interest. At the end of the survey, participants were debriefed and thanked.

Measures. *Perceived masculinity of veg*n men and women* was measured by asking participants to rate the masculinity of nine different social groups, including vegetarian men, vegan men, vegetarian women, and vegan women, on a 7-point scale ranging from *Extremely*

feminine to *Extremely masculine*. The ratings of vegetarian and vegan men were averaged into a single score of perceived masculinity of veg*n men, while the ratings of vegetarian and vegan women were averaged into a score of perceived masculinity of veg*n women (α = .93, *M* = 4.36, *SD* = 1.17 and α = .91, *M* = 3.17, *SD* = 1.06, respectively).

*Negative attitudes towards veg*n men and women* were measured using visual thermometer scales based on MacInnis and Hodson (2017). Participants indicated how warm or favourable versus cold or unfavourable they felt towards nine different social groups, including vegetarian men, vegan men, vegetarian women, and vegan women on 10-point thermometer scales. The scores were reversed and averaged into a single score for veg*n men (α = .92, *M* = 3.89, *SD* = 2.55) and veg*n women (α = .91, *M* = 3.72, *SD* = 2.50), respectively, so that higher scores represent more negative attitudes towards veg*n men and women.

Gender role beliefs were measured using the 22 items of Glick and Fiske's (1996) Ambivalent Sexism Inventory, which measures both hostile (e.g., "Many women are actually seeking special favours, such as hiring policies that favour them over men, under the guise of asking for 'equality'") and benevolent sexism (e.g., *"*A good woman should be set on a pedestal by her man"). Participants indicated their agreement with the statements on 7-point scales anchored by *Completely disagree* and *Completely agree*. Since we had no separate predictions for hostile and benevolent sexism, we averaged all items into a single score with higher scores reflecting a stronger endorsement of traditional gender role beliefs (α = .89, *M* = 3.11, *SD* = 0.94).[2]

Results

Zero-order correlations. Table 1 shows the zero-order correlations between the variables of interest. Confirming our expectation, perceived masculinity of veg*n men was correlated with more negative attitudes towards them. Masculinity perceptions of veg*n women were,

however, not significantly associated with attitudes towards them. Furthermore, more traditional gender role beliefs were significantly correlated with more negative attitudes towards both veg*n men and veg*n women.

Table 1

Zero-order Correlations between Variables in Study 1

	1	2	3	4	5
1. Masculinity of veg*n men	/	-.53***	-.23***	-.17***	-.09
2. Masculinity of veg*n women		/	-.01	-.02	-.05
3. Negative attitudes towards veg*n men			/	.93***	.23***
4. Negative attitudes towards veg*n women				/	.21***
5. Traditional gender role beliefs					/

Note. * p < .05, ** p < .01, *** p < .001.

Moderation analysis. To test our main hypothesis that the relationship between perceived masculinity and negative attitudes towards veg*n men would be stronger for those with more (vs. less) traditional gender role beliefs, we conducted a regression analysis. The centred scores of perceived masculinity of veg*n men and gender role beliefs, as well as their interaction term, were entered as predictors of attitudes towards veg*n men. The results showed that lower perceived masculinity was associated with more negative attitudes towards veg*n men, b = -.41, *s.e.* = .10, $t(451) = -4.16$, $p < .001$, 95% confidence interval (CIs) = [-.611, -.219]. Further, more traditional gender role beliefs were associated with more negative attitudes, b = .54, *s.e.* = .12, $t(451) = 4.45$, $p < .001$, 95% CIs = [.305, .785].

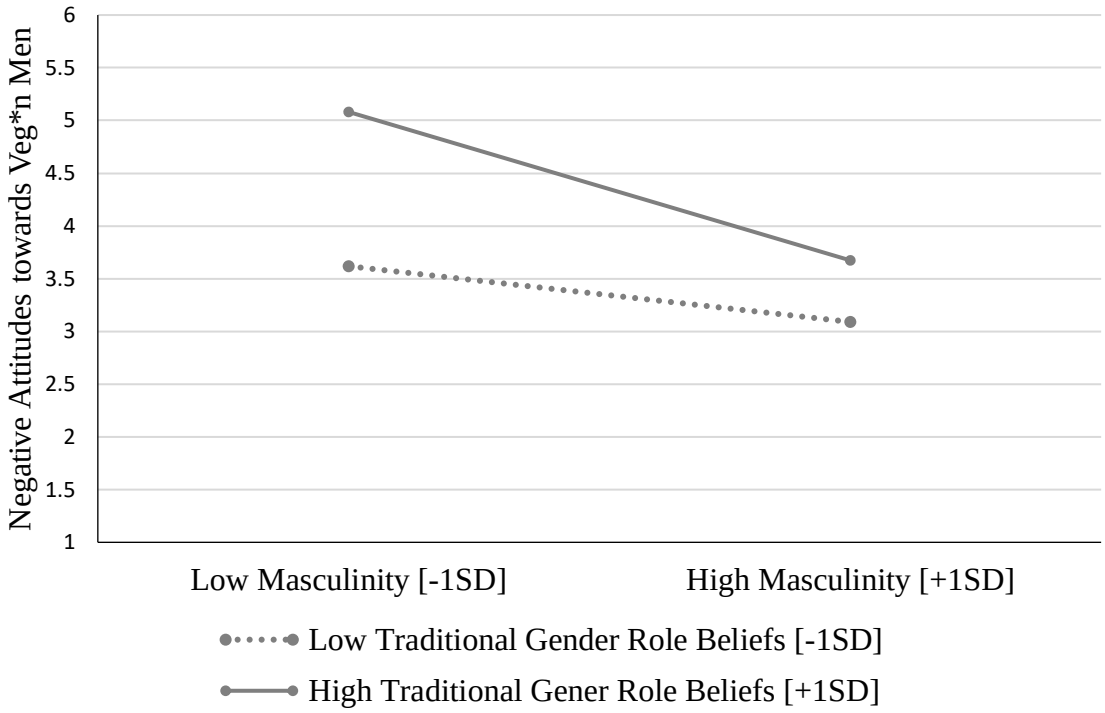
More importantly, as presented in Figure 1, the interaction between perceived masculinity and gender role beliefs was significant, b = -.20, *s.e.* = .09, t(451) = -2.13, p = .034, 95% CIs = [-.386, -.015]. Corroborating our hypothesis, perceived masculinity predicted negative attitudes at high levels of traditional gender role beliefs (mean +1SD, b = -.60, *s.e.* = .12, t(451) = -5.00, p < .001, 95% CIs = [-.840, -.366]), but not at low levels of traditional gender role beliefs (mean -1SD, b = -.23, *s.e.* = .15, t(451) = -1.56, p = .120, 95% CIs = [-.523, .059]).

Next, we conducted the same analysis to test the interaction between perceived masculinity of veg*n woman and gender role beliefs on attitudes towards veg*n women. This analysis yielded a significant main effect of traditional gender role beliefs, b = .54, *s.e.* = .12, t(451) = 4.39, p < .001, 95% CIs = [.297, .779], but neither perceived masculinity of veg*n women nor the interaction with gender role beliefs were significant predictors, b = -.04, *s.e.* = .11, t(451) = -0.37, p = .709, 95% CIs = [-.256, .174] and b = .11, *s.e.* = .11, t(451) = 1.06, p = .288, 95% CIs = [-.096, .323], respectively.[3]

The results of Study 1 confirmed our moderation hypothesis by demonstrating that lower perceived masculinity of veg*n men was significantly associated with more negative attitudes towards them, but only among those holding more (vs. less) traditional gender role beliefs. In other words, Study 1 provides supportive evidence for the idea that especially those endorsing traditional gender role beliefs show greater bias against men who violate the traditional masculine gender stereotype that ‘real’ men eat meat. Further in line with this idea, we did not find such pattern of results when focusing on attitudes towards veg*n women.

Figure 1

*Negative Attitudes towards Veg*n Men as a Function of Perceived Masculinity and Traditional Gender Role Beliefs (Study 1)*



Study 2

Study 1 focused on attitudes towards veg*n men and did not allow for a direct comparison with attitudes towards omnivorous men. Therefore, in Study 2, we used an experimental design to test the causal effect of diet on perceived masculinity of vegan men and negative attitudes towards vegan men, relative to omnivorous men. Specifically, we experimentally manipulated the diet of a male target person described in a vignette by presenting the target as either a vegan or an omnivore. Furthermore, we measured bias towards vegan men with a wider range of measures by including measures of perceived warmth, social avoidance, and discrimination intentions. We preregistered our methods and hypotheses on the Open Science Framework (https://osf.io/9fsqy).

Method

Participants. In order to determine the required sample size, we conducted Monte Carlo simulations in Mplus (Thoemmes, MacKinnon, & Reiser, 2010). The simulation revealed that a sample size of N = 110 participants yielded 95% power (Giner-Sorolla et al., 2020) to detect a small indirect effect (R = .02) of the manipulation on attitudes through perceived masculinity. Because we expected that the association between perceived masculinity and attitudes would be moderated by gender role beliefs, we doubled this sample size in order to detect the interaction effect (Giner-Sorolla et al., 2020), resulting in a suggested sample size of N = 220. To allow for the removal of participants based on our exclusion criteria, we recruited 251 participants based in the UK on Prolific. Thirty-four participants were removed from the analyses because they reported a diet other than omnivorous or flexitarian or failed the manipulation check, resulting in a final sample size of N = 217. Of those, 50.2% identified as woman, 47.5% as man, 1.4% as gender-queer, gender-non-conforming, non-binary, or other, and 0.3% selected "Prefer not to say". Participant age ranged from 18 to 65 years, with a mean age of 31.67 years (SD = 10.79).

Materials. We manipulated the diet of the target (omnivorous *vs.* vegan) in a between-subjects design using vignettes based on Ruby and Heine (2011). The vignettes described a fictitious person called Jacob and were identical except for Jacob's diet. He was either described as an omnivore or as a vegan, and the examples of foods he eats regularly either included animal products or not, respectively. The vignette for the omnivorous condition read:

> "Jacob enjoys going to the movies, attending concerts for any type of music, and hiking in his spare time. He is average height and college educated. He follows a varied omnivorous diet, eating a broad range of fruits, vegetables, whole grains, dairy, eggs, meat, and fish. He usually cooks for himself."

In the vegan condition, the third sentence was changed to "He follows a varied vegan diet, eating a broad range of fruits, vegetables, whole grains, nuts, and beans (but no meat, fish, dairy, or eggs)".

Perceived masculinity of the target was measured with two items. Participants rated how masculine and feminine they perceived Jacob to be on 7-point scales anchored by *Not masculine at all / Not feminine at all* and *Very masculine / Very feminine*. The femininity score was reversed and the two items were averaged into a single masculinity score ($\alpha = .66$, $M = 4.69$, $SD = 0.99$).

We measured *attitudes towards the target* with three measures following MacInnis and Hodson (2017). *Perceived warmth* was measured with a 10-point visual thermometer scale, on which participants indicated how *Cold / Unfavourable* or *Warm / Favourable* they felt towards Jacob. The scores were reversed so that higher scores reflect a more unfavourable impression of Jacob ($M = 4.49$, $SD = 1.88$). We measured participants' *social avoidance* of the target ($\alpha = .81$, $M = 2.82$, $SD = 1.23$) with four items. Participants indicated on 7-point scales how open they would be to interacting with or forming relationships with Jacob (*Not at all* to *Very much so*). An example item is: "How open would you be to becoming friends with Jacob?". Scores were reversed so that higher scores reflect higher social avoidance. Participants' *discrimination intentions* towards the target ($\alpha = .89$, $M = 2.13$, $SD = 1.03$) were measured with two items. Participants indicated on a 7-point scale how comfortable they would feel to rent to Jacob if they were a landlord, or to hire Jacob if they were an employer. Scores were reversed so that higher scores reflect stronger discrimination intentions.

We measured gender role beliefs with the same scale as in Study 1 ($\alpha = .93$, $M = 3.27$, $SD = 1.13$).

Procedure. Participants were invited on Prolific to participate in an online study about impressions of people. They gave their informed consent before being randomly allocated to either the vegan target condition or the omnivorous target condition. They were then presented with the vignette and instructed to read it carefully. Participants were only able to continue to the next page after 20 seconds, in order to ensure they took the time to read the vignette. Afterwards, they were asked three questions about the content of the vignette, two of which were distractors, and one was the manipulation check, asking about the diet of the target (*A varied omnivorous diet / A varied vegan diet / A varied low-carb diet*). Following our preregistration, participants who failed this manipulation check were excluded from all analyses.

Next, participants evaluated the masculinity of Jacob, and completed the three attitude measures, followed by demographic questions. Finally, participants were debriefed, thanked, and paid £0.70 as compensation.

Results

To test whether perceived masculinity of the target and attitudes towards the target differed between condition (vegan vs. omnivorous target), we conducted univariate analyses of variance (ANOVAs), entering perceived masculinity and the attitude measures as the dependent variables. Confirming our hypotheses, the results (see Table 2) showed that the vegan target was perceived as significantly less masculine than the omnivorous target, $F(1, 215) = 10.44$, $p = .001$, $\eta^2 = .046$. Also as expected, participants expressed significantly more negative attitudes towards the vegan target than towards the omnivorous target, $F(1, 215) = 19.85$, $p < .001$, $\eta^2 = .085$, and participants were more inclined to socially avoid the vegan target than the omnivorous target, $F(1, 215) = 25.63$, $p < .001$, $\eta^2 = .107$. Discrimination intentions did not differ significantly between conditions, $F(1, 215) = 1.80$, $p = .181$, $\eta^2 = .008$.

Table 2

Means and Standard Deviations by Condition in Study 2

	Omnivorous condition (N = 107)		Vegan condition (N = 110)	
	M	*SD*	*M*	*SD*
Negative attitudes	3.93[a]	1.54	5.03[b]	2.03
Social avoidance	2.42[a]	1.05	3.27[b]	1.40
Discrimination intentions	2.00[a]	0.92	2.19[a]	1.11
Masculinity	4.90[a]	0.97	4.48[b]	0.96

Note. Means not sharing the same letter indicate significant differences between conditions.

Next, we tested the moderation hypothesis stating that the differential masculinity perceptions of the vegan and omnivorous target would be associated with differential attitudes and social avoidance towards the target, yet especially so among those holding more traditional (versus less traditional) gender role beliefs. Statistically, this means we conducted two analyses (using Process, Model 14; Hayes, 2017) to test the effect of diet on a) negative attitudes and b) social avoidance as the dependent variables. Perceived masculinity was included as the mediator of these associations while gender role beliefs were entered as the moderator of the association between perceived masculinity and negative attitudes as well as between perceived masculinity and social avoidance (i.e., second stage moderated mediation model). In both models, gender role beliefs and perceived masculinity were mean-centred prior to the analysis.

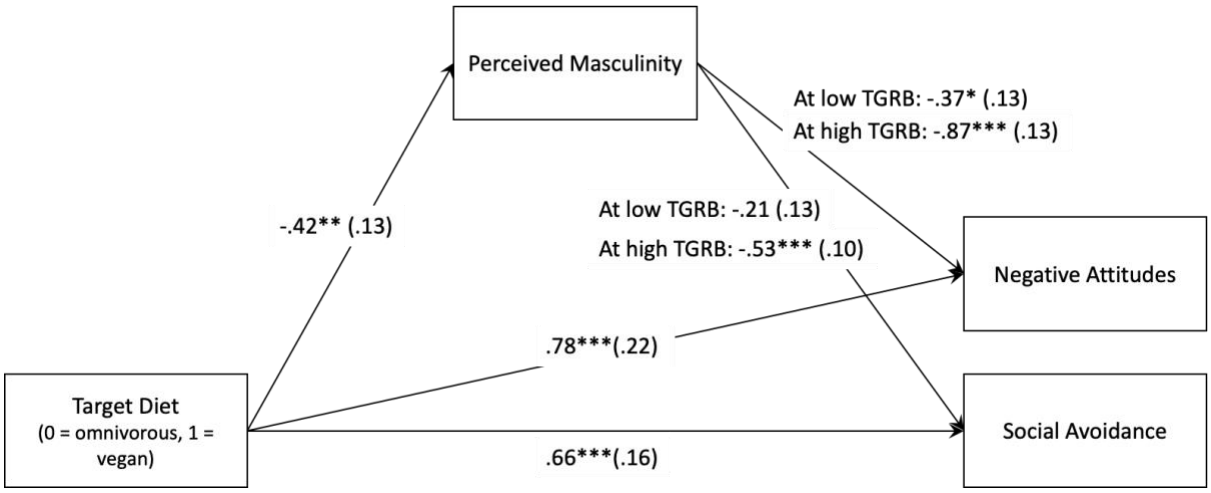
Corroborating our hypothesis, and as shown in Figure 2, these analyses yielded a significant interaction effect between perceived masculinity and gender role beliefs on both

negative attitudes, b = -.22, *s.e.* = .09, $t(212)$ = -2.27, p = .024, 95% CIs = [-.408, -.029]), and social avoidance, b = -.14, *s.e.* = .07, $t(212)$ = -2.11, p = .035, 95% CIs = [-.280, -.010]. Specifically, lower perceived masculinity showed a stronger association with more unfavourable attitudes at higher levels of traditional gender role beliefs, b = -.87, *s.e.* = .13, $t(212)$ = -6.45, $p <$ .001, 95% CIs = [-1.132, -.601], than at lower levels of traditional gender role beliefs, b = -.37, *s.e.* = .18, t(212) = -2.06, p = .040, 95% CIs = [-.733, -.017]. Along similar lines, perceived masculinity was significantly associated with higher social avoidance, but only at high levels of traditional gender role beliefs, b = -.53, *s.e.* = .10, $t(212)$ = -5.56, p < .001, 95%CIs = [-.720, -.344], not at low levels of traditional gender role beliefs, b = -.21, *s.e.* = .13, $t(212)$ = -1.59, p = .112, 95% CIs = [-.460, .049].

Furthermore, diet of the target had a significant indirect effect on negative attitudes through perceived masculinity, but only at high levels of traditional gender role beliefs, b = .37, *s.e.* = .13, 95% BCIs = [.137, .638], not at low levels of traditional gender role beliefs, b = .16, *s.e.* = .11, 95% BCIs = [-.020, .409]. Along similar lines, diet of the target had a significant indirect effect on social avoidance through perceived masculinity at high levels of traditional gender role beliefs, b = .23, *s.e.* = .08, 95% BCIs = [.082, .390], but not at low levels of traditional gender role beliefs, b = .09, *s.e.* = .07, 95% BCIs = [-.039, .251].[4]

Figure 2

Results of Moderated Mediation Models in Study 2



Note. Figure shows the results of the two moderated mediation models in Study 2 and includes both outcome variables (negative attitudes and social avoidance). TGRB = Traditional Gender Role Beliefs. * $p < .05$, ** $p < .01$, *** $p < .001$.

Confirming our expectations, an identical male target was evaluated as less masculine and more negatively when described as being vegan than when described as being omnivore, and participants were less inclined to make friends or socialize with him. Moreover, corroborating our moderation hypothesis, particularly among those holding more traditional gender role beliefs, lower perceived masculinity was associated with more negative attitudes towards and greater social avoidance of the vegan target relative to the omnivorous target. It should be noted that discrimination intentions did not differ between conditions. While participants were less inclined to socialise with the vegan target, they did not express lower intentions to hire him or rent to him, possibly due to stereotypes about veg*ns as conscientious and well-educated (see also MacInnis & Hodson, 2017).

Study 3

The aim of Study 3 was threefold. First and foremost, we tested whether the effects of Study 2 replicate beyond fictional characters and apply to interactions with (ostensibly) real people. Secondly, we explored whether the perception of vegan men depends on the motivation for their vegan diet by manipulating the vegan targets' motivations for being vegan. Veg*ns who cite concern for animals as their motivation tend to be disliked more than those who cite health or environmental reasons (MacInnis & Hodson, 2017). This might be particularly true for men, for whom concern for animals violates gender roles of toughness and dominance, and who therefore may be perceived as particularly lacking in masculinity. Thirdly, we explored the role of perceived empathy. Presumably, veg*ns are perceived as more empathetic than omnivores given that veg*nism signals moral concern for animals and the environment. Indeed, in one study, vegetarian targets were perceived to be more virtuous than omnivorous targets (Ruby & Heine, 2011). We were interested in how perceived empathy relates to evaluations of male vegans.

We conducted a pre-registered between-subjects experiment (https://osf.io/nfp8e/?view_only=5ae2e712304c4f61b69d047d49f76516) with three conditions. Participants were ostensibly interacting with another participant who either introduced himself as an omnivore (control condition), as a vegan motivated by concern about climate change (environmental vegan condition), or as a vegan motivated by concern for animals (animal vegan condition). We expected that the vegan targets would be perceived as less masculine and in turn evaluated more negatively than the omnivorous target, in line with the results of Study 2. We also expected that the association between masculinity and evaluation of the target would be particularly strong for participants higher (vs. lower) in traditional gender role beliefs. Furthermore, we tested whether the animal vegan would be

perceived as less masculine and in turn evaluated more negatively than the environmental vegan.

Finally, with regards to the role of perceived empathy and compassion, we had opposing expectations. Recent work indicated that omnivores have ambivalent views about vegans in general, perceiving them negatively as annoying and moralistic and therefore as less sociable, but also positively as caring and moral and therefore as more sociable (De Groeve, Hudders, & Bleys, 2021). Based on the findings of De Groeve et al. (2021), it could be expected that vegan men are perceived as more empathetic and therefore evaluated more positively given that empathy is a socially desirable trait. On the other hand, based on the current findings, it is plausible that higher empathy among vegan men is associated with more negative attitudes towards them because it violates masculine gender roles of stoicism and toughness.

Method

Participants. We determined the required sample size based on the smallest effect size from Study 2 we aimed to replicate, which was the small interaction effect between masculinity and traditional gender role beliefs. Power analysis in G*Power revealed a required sample size of $N = 543$ in order to detect a small interaction effect with 95% power. In order to allow for exclusion based on our pre-registered exclusion criteria, we recruited 603 participants based in the UK on Prolific. Of those, 17 were excluded because they indicated following a restricted diet. Of the final 543 participants, 59.9% identified as man, 39.1% as woman, 0.9% as gender-queer, gender-non-conforming, non-binary, or other, and 0.2% selected "Prefer not to say".[5] Participant age ranged from 18 to 63 years, with a mean age of 25.5 years (SD = 8.06).

Materials. We manipulated the diet and motivation of the target person in a between-subjects design by presenting participants with introductions ostensibly written by another participant. The introduction of the omnivorous target read:

"Hi, I'm Jacob, I'm in my second year at uni. I cook for myself most of the time. I'll eat pretty much anything, meat, fish, veg, grains, nuts, I don't really have a preference. I'm really into hiking and cycling and I play the guitar. Before the Covid pandemic, I enjoyed going to see gigs and movies."[6]

In the vegan conditions, the third sentence was changed to "I'll eat pretty much anything as long as it's vegan. Beans, veg, grains, nuts, I don't really have a preference. I went vegan a while ago because meat production contributes so much to climate change / because there is so much animal suffering involved in meat production.", for the environmental and animal vegan, respectively.

Perceived masculinity of the target (⟨ = 0.79, *M* = 4.84, *SD* = 1.20), negative attitudes towards the target (*M* = 4.25, *SD* = 1.69) and social avoidance of the target (⟨ = 0.71, *M* = 3.25, *SD* = 1.13) were measured as in Study 2.

Perceived *empathy* (⟨ = 0.70, *M* = 5.63, *SD* = 0.93) was measured as the mean of two items. Participants rated how empathetic and how compassionate the target appeared to them on 7-point scales anchored by *Not empathetic at all / Not compassionate at all* and *Very empathetic / Very compassionate*, respectively.

Gender role beliefs (α = .91, *M* = 3.43, *SD* = 1.04) were measured as in Study 1 and 2.[7]

Procedure. We invited participants on Prolific to participate in an online study about impressions of people. Only participants who had not participated in Study 2 were able to take part. Participants gave their informed consent before being randomly allocated to either the omnivorous condition, the environmental vegan condition, or the animal vegan condition.

We then informed participants that they would be paired with another participant. To make this cover story more credible, we asked participants to wait for 30 second while they were allegedly paired with the other participant. Next, participants were asked to write a few sentences to introduce themselves. After submitting their introduction, participants waited for 15 seconds, supposedly to give the partner a chance to finish their introduction. Participants were then presented with the partner's introduction and were able to continue to the next page after 20 seconds, in order to ensure they took the time to read it. Afterwards, participants completed the masculinity, empathy, and attitude measures, before completing the gender role belief measure and demographic questions. Finally, participants were debriefed, thanked, and paid £1.50 as compensation.

Results

Table 3 shows means and standard deviations of our dependent variables by condition. In testing our hypotheses, we followed our pre-registered analysis plan. First, we tested the main effect of diet condition (omnivore, environmental vegan, animal ethics vegan) on perceived masculinity, perceived empathy, social avoidance of the target, and negative attitudes towards the target. To this end, we created two contrast-coded variables to compare a) the two vegan conditions to the omnivore (control) condition (i.e., coded 1, -1, -1) and b) the two vegan (experimental) conditions with each other (i.e., coded 0, 1, -1), and conducted regression analyses with the two contrast variables predicting the outcome variables.

Confirming our hypothesis, the vegan targets were perceived as significantly less masculine and more empathetic compared to the omnivorous target, b = -.35, *s.e.* = 0.05, $t(583) = -6.85$, $p < .001$, 95% CIs = [-.444; -.246] and b = .28, *s.e.* = 0.04, $t(583) = 7.12$, $p < .001$, 95% CIs = [.200; .352], respectively. Furthermore, participants also reported stronger intentions to socially avoid the vegan targets and more negative attitudes towards the vegan targets compared to the omnivorous target, b = .18, *s.e.* = 0.05, $t(583) = 3.62$, $p < .001$, 95%

CIs = [.081; .272] and b = .16, *s.e.* = 0.07, $t(583) = 2.21$, p = .028, 95% CIs = [.018; .307], respectively. However, no significant differences were found between the environmental and animal ethics vegan for any of the outcome variables, ps > .130. For this reason, the two vegan conditions were collapsed to compare them to the omnivorous condition in all subsequent analyses.

Next, we investigated whether lower perceived masculinity of the vegan targets was further associated with more negative attitudes towards them, and whether this effect was moderated by participants' traditional gender role beliefs. In a moderated mediation model using the R package lavaan (Rosseel, 2012), we tested the effect of target diet (omnivorous vs vegan) on a) social avoidance and b) negative attitudes and modelled masculinity (mean-centred) and empathy as parallel mediators of these effects. Critically, as in Study 2, traditional gender role beliefs (mean-centred) were modelled as the moderator of the association between masculinity and the outcomes (see Figure 3a and 3b). We expected that this path would be stronger for participants higher (vs lower) in traditional gender role beliefs.

Table 3

Means and Standard Deviations by Condition in Study 3

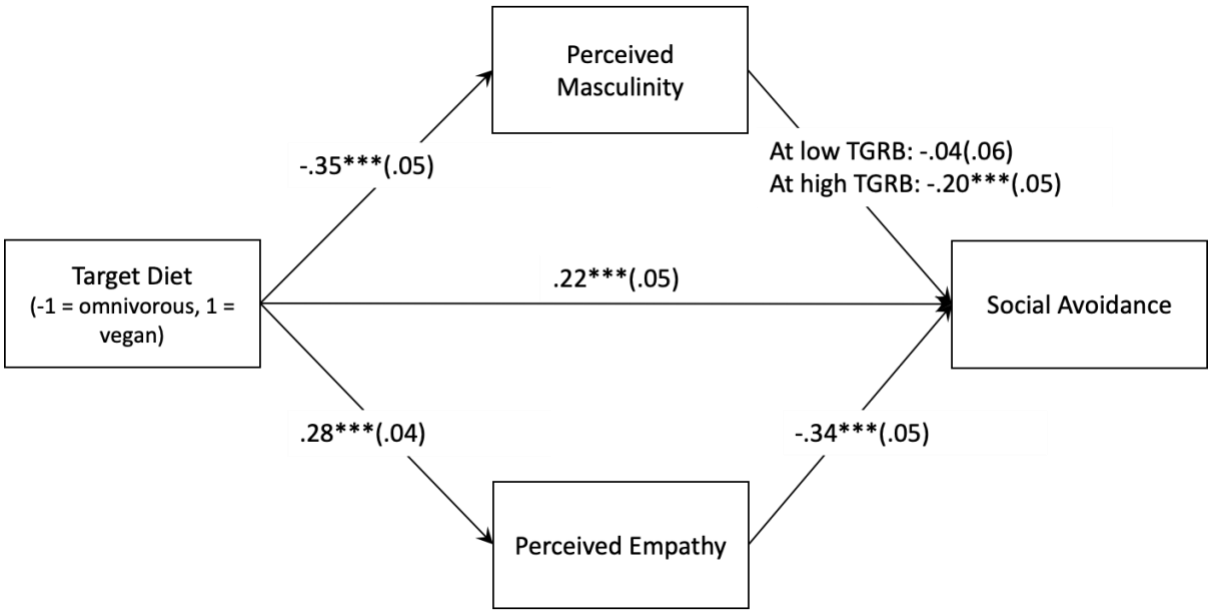
	Omnivorous condition (N = 200)		Environmental vegan condition (N = 192)		Animal vegan condition (N = 194)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Negative attitudes	4.04^{a}	1.52	4.38^{b}	1.77	4.34^{ab}	1.77
Social avoidance	3.02^{a}	0.96	3.34^{b}	1.20	3.41^{b}	1.19
Masculinity	5.30^{a}	1.06	4.52^{b}	1.17	4.69^{b}	1.24
Empathy	5.27^{a}	0.90	5.75^{b}	0.89	5.89^{b}	0.88

Note. Means not sharing the same letter indicate significant differences between conditions.

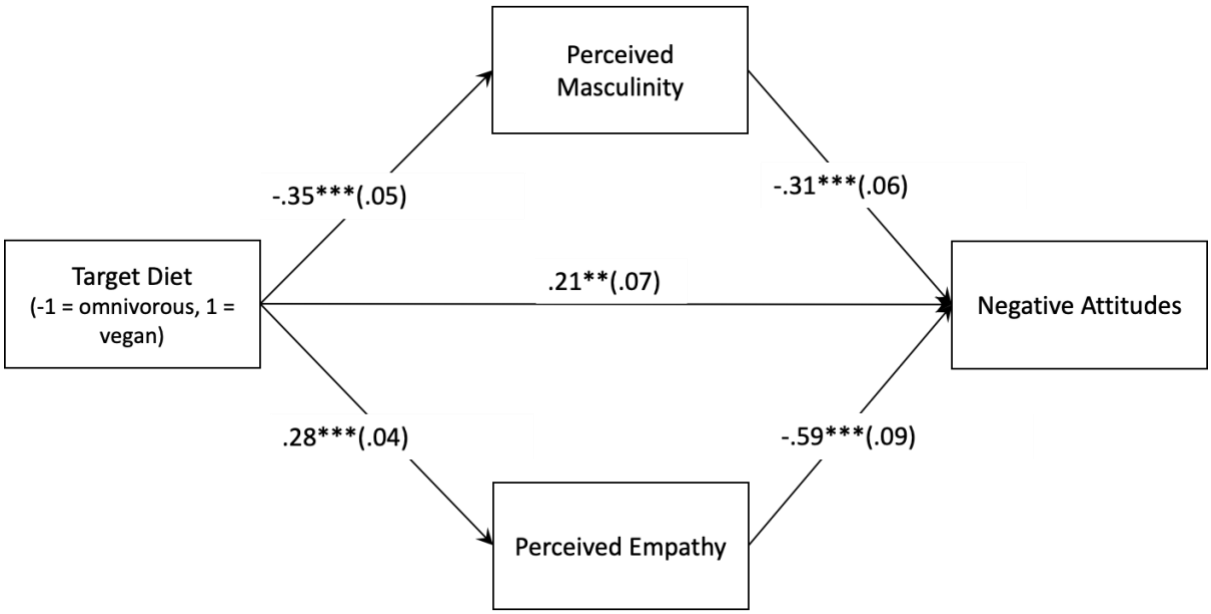
Figure 3

Results of Moderated Mediation Models in Study 3

a) Social Avoidance as Dependent Variable



b) Negative Attitudes as Dependent Variable



Note. TGRB = Traditional Gender Role Beliefs. * $p < .05$, ** $p < .01$, *** $p < .001$.

In line with our hypothesis, the findings revealed a significant interaction effect of masculinity and traditional gender role beliefs on social avoidance, $b = -.08$, *s.e.* = .03, $p = .025$, 95% BCIs = [-.145, -.011]. Higher masculinity predicted lower social avoidance at high levels of traditional gender role beliefs, $b = -.20$, *s.e.* = .05, $p < .001$, 95% BCIs = [-.292, -.103], but not at low levels of traditional gender role beliefs, $b = -.04$, *s.e.* = .06, $p = .483$, 95% BCIs = [-.147, .070]. The interaction between traditional gender role beliefs and masculinity on negative attitudes was not significant, $b = -.07$, *s.e.* = .05, $p = .184$, 95% BCIs = [-.173, .030].

Furthermore, the indirect effect of diet of target on social avoidance through masculinity was significantly moderated by traditional gender role beliefs, index of moderated mediation = .03, *s.e.* = .01, $p = .036$, 95% BCIs = [.004; .053]. As predicted, the indirect effect was significant only at high levels of traditional gender role beliefs, $b = .07$,

s.e. = .02, p = .001, 95% BCIs = [.033, .112], not at low levels of traditional gender role beliefs, b = .02, *s.e.* = .05, p = .446, 95% BCIs = [-.024, -.053].

Diet of target also had a significant indirect effect on social avoidance through empathy, b = -.10, *s.e.* = .02, p < .001, 95% BCIs = [-.147, -.069]. Specifically, as outlined above, vegan targets were perceived as more empathetic than omnivorous targets, and higher empathetic concern was further associated with lower social avoidance, b = -.34, *s.e.* = .05, p < .001, 95% BCIs = [-.445, -.248]. Hence, while vegan diet had an indirect positive effect on social avoidance through lower perceived masculinity, the indirect effect through perceived empathy was negative.

With respect to negative attitudes, we found significant indirect effects of diet of target through both perceived masculinity (positively) and empathy (negatively), b = .11, *s.e.* = .03, p < .001, 95% BCIs = [.059, .162] and b = -.10, *s.e.* = .02, p < .001, 95% BCIs = [-.134, -.061], respectively. In other words, lower perceived masculinity of vegan targets predicted more negative attitudes, while higher perceived empathy of vegan targets predicted less negative attitudes.

Given the absence of a significant moderation effect between perceived masculinity and traditional gender role beliefs on negative attitudes, also the indirect effect of diet of target through masculinity on negative attitudes was not significantly moderated by traditional gender role beliefs, index of moderated mediation = .02, *s.e.* = .02, p = .201, 95% BCIs = [-.011; .063]. However, diet of target (omnivorous vs. vegan) had a significant indirect effect on negative attitudes through lower perceived masculinity for both those higher and lower in traditional gender role beliefs.[8]

The results of Study 3 largely corroborate our hypotheses and provide a replication of the results of Study 2 in a context that simulates real-world online interactions. Participants rated an otherwise identical ostensible study participant as less masculine, evaluated him

more negatively, and had stronger intentions to socially avoid him if he introduced himself as a vegan rather than an omnivore. In line with the results of Study 2, the lower the partner's perceived masculinity, the higher intentions were to socially avoid him, but only for participants who hold more traditional (vs. more egalitarian) gender role beliefs. Perceived masculinity also partly explained why participants expressed more negative attitudes towards the vegan partner, but this effect did not depend on their traditional gender role beliefs. Furthermore, vegan men were perceived as more empathetic than omnivorous men, and the more empathetic participants perceived them to be the more positive their attitudes towards them and the lower their intentions to socially avoid them were. Hence, a vegan diet made our targets appear simultaneously less socially attractive through lower perceived masculinity, and more socially attractive through higher perceived empathy. Finally, men who said they were vegan because of concern for animals were not evaluated any differently from men who said they were vegan because of concern over climate change. This indicates that, at least for our participants, veganism signalled lower masculinity and triggered bias, regardless of the motivation behind it.

General Discussion

Alternative diets which exclude animal products (i.e., veg*n diets) have soared in popularity in recent years, as evidenced for example by record numbers of people signing up for the "Veganuary" campaign in 2021, which encourages people to commit to a vegan diet for the month of January (Carrington, 2021). Despite these developments, veg*ns remain a minority and still face bias and prejudice because of their dietary choices, and this seems to be particularly true for veg*n men. This research identified some of the key factors associated with bias against male veg*ns.

Specifically, three studies demonstrated that perceiving veg*n men as less masculine is associated with more bias towards them, particularly amongst those who hold more

traditional gender role beliefs. Particularly compelling is that Study 2 and 3 experimentally showed that an otherwise identical male target was perceived as less masculine if described as a vegan rather than an omnivore. Further, the less masculine the target was perceived to be, the less likable he was perceived to be, and the more ready our participants were to socially avoid him.

These findings support our hypotheses derived from Social Role Theory (Eagly & Wood, 1999), proposing that men and women are stereotyped to differ in their meat consumption patterns, with men, but not women, being expected to consume large amounts of meat (Rozin et al., 2012; Stein & Nemeroff, 1995). Veg*n men violate traditional gender role norms by eschewing this traditionally masculine behaviour of eating meat and, as our findings demonstrate, this norm violation is associated with bias towards veg*n men.

Critically, the studies showed that these effects were qualified by a moderation effect of sexist beliefs. The association between masculinity perceptions of veg*n men and negative attitudes towards them as well as intentions to socially avoid them was strongly pronounced among those who strongly endorse traditional gender role beliefs but was significantly weaker or non-significant among those holding less traditional gender role beliefs, except for the effect on negative attitudes in Study 3. Regarding the latter, lower perceived masculinity was associated with more negative attitudes and higher social avoidance both for participants with more and less traditional gender role beliefs, without significant moderation by gender role beliefs. Taken together, our results thus highlight the importance of considering individual differences in gender role beliefs when investigating the penalisation of gender role violations. In doing so, we provided an empirical test of the theoretical yet rarely tested idea that gender role beliefs moderate the effect of gender role violations on bias and prejudice (Deutsch & Saxon, 1998).

Finally, in Study 3 we also showed that while a vegan diet predicts negative attitudes through lower perceived masculinity, it also predicts more positive attitudes through higher perceived empathy. This is in line with a recent study on ambivalent stereotypes about veg*ns. While veg*ns are seen as more eccentric and moralistic than omnivores, which in turn predicts viewing them as less sociable and socially attractive, they are also perceived as more moral and compassionate than omnivores, offsetting part of the effects of negative stereotypes on perceived social attraction (De Groeve et al., 2021). Along similar lines, we found that while male veg*ns become targets of bias because they are seen as unmanly, these effects seem to be slightly offset by the fact that they are also seen as empathetic and compassionate. Our research further suggests that stereotypes associated with veg*ns and how they inform attitudes likely differ between male and female veg*ns, which could be tested explicitly in future research.

Crucially, in Study 3, participants were also led to believe that the person they were evaluating was another participant, thus simulating a real-world online interaction. This raises our confidence that bias against vegan men, in part due to perceived gender role violations, can be observed in real-world interactions. Accordingly, the findings substantiate the lived experiences of veg*n men. Specifically, Studies 2 and 3 showed that participants were significantly less likely to want to be friends with or generally socialize with veg*ns than with omnivores, which mirrors qualitative accounts from both source and targets of this social avoidance. Many veg*ns report having to endure mockery and friends decreasing contact after switching to a veg*n diet (MacInnis & Hodson, 2017), and male veg*ns in particular report that the backlash they face is often based on their perceived lack of masculinity (Nath, 2011). Our findings are also in line with research showing that omnivores and veg*ns see veg*nism as a barrier towards successful social interactions with others (Chuck, Fernandes, & Hyers, 2016; Markowski & Roxburgh, 2019), possibly in part because

of the important socially binding role of meat (De Groeve et al., 2021). Given how detrimental social exclusion can be to the emotional and physical well-being of those excluded (Williams & Nida, 2011), anti-veg*n bias can come with grave consequences for veg*ns. Our research thus highlights the importance of reducing gendered anti-vegan bias, which in turn could also pave the way for more men to pursue a veg*n diet.

Practical Implications

Men consume more meat than women and are therefore responsible for a large proportion of global meat consumption. Thus, interventions to tackle meat consumption among men could be particularly impactful. However, men are more resistant to interventions aimed at reducing meat consumption and attachment (Dowsett, Semmler, Bray, Ankeny, & Chur-Hansen, 2018). As long as meat and masculinity are strongly associated, efforts at decreasing men's meat consumption might be fruitless (de Backer et al., 2020; see also Kildal & Syse, 2017). Indeed, anticipating social exclusion or stigma and lack of social support can deter people from pursuing a veg*n diet (Markowsi & Roxburg, 2019). Uncoupling meat and masculinity could be a promising starting point for interventions to reduce gendered anti-vegan bias and meat consumption among men.

Greater awareness of the meat-masculinity link, and its potential for damaging their message, has led animal and vegan advocates to portray veg*nism as more compatible with traditional masculinity. For example, the Netflix Documentary "The Game Changers" follows plant-based and mostly male athletes with the aim of challenging the claim that animal protein is essential for physical strength and performance. Research on whether such efforts actually do help to uncouple meat and masculinity is currently lacking. However, even if successful, they do little to dismantle the expectations associated with traditional masculine stereotypes themselves and might even further substantiate beliefs that men should be strong, athletic, and sexual performers.

As an alternative, to combat the stigma associated with veg*nism, it might be more helpful to promote modern conceptions of masculinity. Modern notions of masculinity are more flexible and inclusive than traditional notions, allowing for characteristics usually regarded as feminine (e.g., Anderson & McCormack, 2016; Bridges & Pascoe, 2014). Indeed, recent research has shown that the more men identify with modern masculinity, the less attached they are to meat, and the more positive their attitudes towards vegetarians (DeBacker et al., 2020).

Limitations and Directions for Future Research

Despite consistent support for our predictions, some limitations should be noted. Firstly, even though we found consistent support for the idea that masculinity perceptions shape attitudes towards veg*n men, we did not manipulate masculinity perceptions. Therefore, whether perceived masculinity has a causal effect on the evaluation of veg*n men remains to be shown in future work.

Secondly, while we expected that male veg*ns are particularly devalued if concern for animals is their main motivation, in Study 3 the motivation the targets cited for their veg*n diet did not affect their evaluation. The mere act of abstaining from the traditional masculine act of eating meat could be sufficient to trigger perceptions of low masculinity and negative attitudes, regardless of the motivation behind it. However, future studies could include additional motivations for veg*n diets. For example, veg*ns who are motivated mainly by concerns for their personal health might be regarded as particularly lacking in masculinity, given that healthy eating is generally stereotyped as feminine (e.g., Bradbury & Nicolaou, 2012).

Finally, in Study 3, we explored the role of perceived empathy in the evaluation of male veg*ns, suggesting that it might partly offset the negative effect of a veg*n diet on

social perceptions through perceived masculinity. However, given that we did not preregister a specific hypothesis, future research should replicate the role of perceived empathy.

Conclusion

Once considered a niche position, it is now widely accepted that animal agriculture has devastating consequences for the planet and its inhabitants (e.g., Grandin, 2014; Huang et al., 2012; Springmann et al., 2018). Still, global meat consumption is rising (OECD/FAO, 2021). Moreover, those who abstain from meat consumption to reduce the harm to other beings are often ridiculed and actively disliked, and this is particularly true for men. Traditional masculinity and the expectations that men should eat meat and not show compassion deters many men from turning vegetarian or vegan and complicates efforts to reduce global meat consumption. If we are to find sustainable ways of food production, we need to foster alternative ideas of what it means to be a man in society. Or, in the words of one participant (Bogueva et al., 2020, p. 45): “The problem is not with vegetarian food […]. The problem is with the century long built perception of what it is to be a man – muscles, strong, sexy meat eaters.”

Footnotes

1. All studies received ethics approval from the ethics committee at the researchers' University.
2. In both studies, we tested for outliers (values more than three standard deviations above or below the mean) on all dependent variables and did not detect any outliers.
3. We also tested whether any of the associations were moderated by participant gender and found no significant interaction effects (all *ps* >= .584).
4. We also tested whether any of the associations were moderated by participant gender and found no significant interaction effects (all *ps* >= .246).
5. We also included an attention check asking participants about the other participant's diet as well as the reason for their diet. However, we decided not to exclude participants based on the attention check question. The attention check question was not informative given that the questions asked about "Jacob", but one third of participants read about "Alex" (see Footnote 6). However, results with those participants excluded who failed the check are largely consistent with results using the full dataset, except that the interaction effect between masculinity and gender role beliefs on social avoidance becomes marginally significant.
6. The target was erroneously called "Alex" instead of "Jacob" in the environmental vegan condition.
7. The study also included measures of participants' levels of speciesism and climate change belief as well as environmental concern as exploratory variables. We also pre-registered that target diet would further affect how much money participants share with the ostensible study partner using a dictator game type measure. However, the measure turned out not to be usable due to a lack of variance (about two-thirds of participants shared half of the money with the other participant). The full dataset including all measures can be found on OSF.
8. We also tested whether any of the associations were moderated by participant gender. There was a significant interaction effect between condition (vegan vs. omnivore) and participant gender on both social avoidance (b = -.22, *s.e.* = .10, $t(576)$ = -2.29, p = .022) and negative attitudes (b = -.29, *s.e.* = .14, $t(576)$ = -1.98, p = .048), with stronger effects for men. No other significant interaction effects were detected (all *ps* >= .133).

References

Adams, C. J. (1990/2015). *The sexual politics of meat. A feminist-vegetarian critical theory.* New York, NY: Continuum.

Allen, M. W., & Baines, S. (2002). Manipulating the symbolic meaning of meat to encourage greater acceptance of fruits and vegetables and less proclivity for red and white meat. *Appetite, 38*(2), 118-130. doi:10.1006/appe.2001.0474

Anderson, E., & McCormack, M. (2016). Inclusive masculinity theory: Overview, reflection and refinement. *Journal of Gender Studies, 27*(5), 547–561. doi:10.1080/09589236.2016.1245605

Bogueva, D., & Marinova, D. (2018). What is more important – Perception of masculinity or personal health and the environment? In D. Bogueva, D. Marinova, & T. Raphaely (Eds.), *Handbook of research on social marketing and its influence on animal origin food product consumption* (pp. 148-162). Hershey, PA: IGI Global. doi:10.4018/978-1-5225-4757-0.ch010

Bogueva, D., Marinova, D., & Gordon, R. (2020). Who needs to solve the vegetarian men dilemma?. *Journal of Human Behavior in the Social Environment, 30*(1), 28-53. doi: 10.1080/10911359.2019.1664966

Blakemore, J. E. (2003). Children's beliefs about violating gender norms: Boys shouldn't look like girls, and girls shouldn't act like boys. *Sex Roles, 48*, 411–419. doi:10.1023/A:1023574427720

Blashill, A. J., & Powlishta, K. K. (2009). The impact of sexual orientation and gender role on evaluations of men. *Psychology of Men & Masculinity, 10*(2), 160-173. doi:10.1037/a0014583

Bradbury, J., & Nicolaou, M. (2012). Men eating female/healthy foods are judged as more feminine than men eating male/unhealthy foods. *Proceedings of the Nutrition Society, 71*, E148. doi:10.1017/S0029665112002054

Bridges, T., & Pascoe, C. J. (2014). Hybrid masculinities: New directions in the sociology of men and masculinities. *Sociology Compass, 8*(3), 246–258. doi:10.1111/soc4.12134.

Buerkle, C. W. (2009). Metrosexuality can stuff it: beef consumption as (heteromasculine) fortification. *Text and Performance Quarterly, 29*, 77-93. doi:10.1080/10462930802514370

Bunn, H. T. (1981). Archaeological evidence for meat-eating by Plio-Pleistocene hominids from Koobi Fora and Olduvai Gorge. *Nature, 291*(5816), 574–577. doi:10.1038/291574a0

Carrington, D. (2021, January 5). Record 500,000 people pledge to eat only vegan food in January. *The Guardian.* Retrieved from https://www.theguardian.com/environment/2021/jan/05/veganuary-record-number-people-pledge-eat-vegan-food-january

Cavazza, N., Guidetti, M., & Butera, F. (2015a). Ingredients of gender-based stereotypes about food. Indirect influence of food type, portion size and presentation on gendered intentions to eat. *Appetite, 91*, 266–272. doi:10.1016/j.appet.2015.04.068

Cavazza, N., Guidetti, M., & Butera, F. (2015b). The gender-based stereotype about food is on the table. Food choice also depends on co-eater's gender. *Psicologia e Sociedade, 10*(2), 161–172. doi:10.1482/80763

Chaiken, S., & Pliner, P. (1987). Women, but not men, are what they eat: the effect of meal size and gender on perceived femininity and masculinity. *Personality and Social Psychology Bulletin, 13*, 166-176. doi:10.1177/0146167287132003

Chan, E. Y., & Zlatevska, N. (2019). Is meat sexy? Meat preference as a function of the sexual motivation system. *Food Quality and Preference, 74*, 78-87. doi:10.1016/j.foodqual.2019.01.008

David, B., Grace, D., & Ryan, M. K. (2004). The gender wars: A self-categorization perspective on the development of gender identity. In M. Bennett & F. Sani (Eds.), *The development of the social self* (pp. 135–157). New York, NY: Psychology Press.

De Backer, C., Erreygers, S., De Cort, C., Vandermoere, F., Dhoest, A., Vrinten, J., & Van Bauwel, S. (2020). Meat and masculinities: Can differences in masculinity predict meat consumption, intentions to reduce meat and attitudes towards vegetarians?. *Appetite, 147*. doi:10.1016/j.appet.2019.104559

De Groeve, B., Hudders, L., & Bleys, B. (2021). Moral rebels and dietary deviants: How moral minority stereotypes predict the social attractiveness of veg* ns. *Appetite, 164*, 105284. doi:10.1016/j.appet.2021.105284

Deutsch, F. M., & Saxon, S. E. (1998). Traditional ideologies, nontraditional lives. *Sex Roles, 38*, 331-362. doi:10.1023/A:1018749620033

DeLessio-Parson, A. (2017). Doing vegetarianism to destabilize the meat-masculinity nexus in La Plata, Argentina. *Gender, Place and Culture, 24*, 1729–1748. doi:10.1080/0966369X.2017.1395822

Dowsett, E., Semmler, C., Bray, H., Ankeny, R. A., & Chur-Hansen, A. (2018). Neutralising the meat paradox: Cognitive dissonance, gender, and eating animals. *Appetite, 123*, 280-288. doi:10.1016/j.appet.2018.01.005

Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist, 54*, 408–423. doi:10.1037/0003-066X.54.6.408

Gal, D., & Wilkie, J. (2010). Real men don't eat quiche: regulation of gender-expressive

choices by men. *Social Psychological and Personality Science, 1*, 291-301. doi:10.1177/1948550610365003

Gaunt, R. (2013). Breadwinning moms, caregiving dads: Double standard in social judgments of gender norm violators. *Journal of Family Issues, 20*, 1–22. doi:10.1177/0192513X12438686

Giner-Sorolla, R., Carpenter, T., Lewis Jr., N. A., Montoya, A. K., Aberson, C. L., Bostyn, D. H., …, Sonderberg, C. (2020). Power to detect what? Considerations for planning and evaluating sample size.

Glick, P., & Fiske, S. T. (1996). The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology, 70*(3), 491-512. doi:10.1037/0022-3514.70.3.491

Graça, J., Calheiros, M.M., & Oliveira, A. (2015). Attached to meat? (Un)Willingness and intentions to adopt a more plant-based diet. *Appetite, 95*, 113–125. doi:10.1016/j.appet.2015.06.024

Grandin, T. (2014). Animal welfare and society concerns finding the missing link. *Meat Science, 98*(3), 461-469. doi:10.1016/j.meatsci.2014.05.011

Greenebaum, J., & Dexter, B. (2017). Vegan men and hybrid masculinity. *Journal of Gender Studies, 27*, 637–648. doi:10.1080/09589236.2017.1287064

Herman, C. P., Roth, D. A., & Polivy, J. (2003). Effects of the presence of others on food intake: a normative interpretation. Psychological bulletin, 129(6), 873-886. doi:10.1037/0033-2909.129.6.873

Huang, T., Yang, B., Zheng, J., Li, G., Wahlqvist, M. L., & Li, D. (2012). Cardiovascular disease mortality and cancer incidence in vegetarians: A metaanalysis and systematic review. *Annals of Nutrition and Metabolism, 60*(4), 233–40. doi:10.1159/000337301

Kaplan, D., Rosenmann, A., & Schuhendler, S. (2017). What about nontraditional masculinities? Toward a quantitative model of therapeutic new masculinity ideology. *Men and Masculinities, 20*(4), 393–426. doi:10.1177/1097184X16634797

Keller, C., & Siegrist, M. (2015). Does personality influence eating styles and food choices? Direct and indirect effects. *Appetite, 84,* 128–138. doi:10.1016/j.appet.2014.10.003

Kildal, C. L., & Syse, K. L. (2017). Meat and masculinity in the Norwegian armed forces. *Appetite, 112,* 69–77. doi:10.1016/j.appet.2016.12.032

Love, H. J., & Sulikowski, D. (2018). Of meat and men: Sex differences in implicit and explicit attitudes towards meat. *Frontiers in Psychology, 9,* 559. doi:10.3389/fpsyg.2018.00559

Lupton, D. (1996). *Food, the body and the self*. London, UK: Sage.

MacInnis, C. C., & Hodson, G. (2015). Why are heterosexual men (vs. women) particularly prejudiced toward gay men? A social dominance theory explanation. *Psychology & Sexuality, 6*(3), 275-294. doi:10.1080/19419899.2014.987684

MacInnis, C. C., & Hodson, G. (2017). It ain't easy eating greens: Evidence of bias toward vegetarians and vegans from both source and target. *Group Processes & Intergroup Relations,* 20(6), 1-24. doi:10.1177/1368430215618253

Markowski, K. L., & Roxburgh, S. (2019). "If I became a vegan, my family and friends would hate me:" Anticipating vegan stigma as a barrier to plant-based diets. *Appetite, 135,* 1-9. doi: 10.1016/j.appet.2018.12.040

Milton, K. (1999). A hypothesis to explain the role of meat-eating in human evolution. *Evolutionary Anthropology, 8*(1), 11–21. doi:10.1002/(SICI)1520-6505(1999)8:1<11::AID-EVAN6>3.0.CO;2-M

Mooney, K. M., & Lorenz, E. (1997). The effects of food and gender on interpersonal perceptions. *Sex Roles, 36,* 639–653. doi:10.1023/A:1025622125603

Mori, D., Chaiken, S., & Pliner, P. (1987). "Eating lightly" and the self-presentation of femininity. *Journal of Personality and Social Psychology, 53,* 693-702. doi:10.1037//0022-3514.53.4.693

Mycek, M. K. (2018). Meatless meals and masculinity: How veg* men explain their plant-based diets. *Food and Foodways, 26,* 223–245. doi:10.1080/07409710.2017.1420355

Nath, J. (2011). Gendered fare? A qualitative investigation of alternative food and masculinities. *Journal of Sociology, 47*(3), 261–278. doi:10.1177/1440783310386828

OECD/FAO (2021). *OECD-FAO agricultural outlook 2021-2030*. OECD Publishing. https://doi.org/10.1787/19428846-en.

Pfeiler, T. M., & Egloff, B. (2018). Examining the "Veggie" personality: Results from a representative German sample. *Appetite, 120,* 246–255. doi:10.1016/j.appet.2017.09.005

Prentice, D. A., & Carranza, E. (2002). What women and men should be, shouldn't be, are allowed to be, and don't have to be: The contents of prescriptive gender stereotypes. *Psychology of Women Quarterly, 26,* 269–281. doi:10.1111/pwqu.2002.26.issue-4

Robinson, E., Tobias, T., Shaw, L., Freeman, E., & Higgs, S. (2011). Social matching of food intake and the need for social acceptance. *Appetite, 56,* 747-752. doi:10.1016/j.appet.2011.03.001

Rogers, R. (2008). Beasts, burgers, and hummers: Meat and the crisis of masculinity in contemporary television advertisements. *Environmental Communication, 2,* 281–301. doi:10.1080/17524030802390250

Rosenfeld, D. L. (2020). Gender differences in vegetarian identity: How men and women construe meatless dieting. *Food Quality and Preference, 81,* doi:10.1016/j.foodqual.2019.103859

Rosseel Y (2012). Lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1–36. https://www.jstatsoft.org/v48/i02/

Rothgerber, H. (2013). Real men don't eat (vegetable) quiche: Masculinity and the justification of meat consumption. *Psychology of Men & Masculinity, 14*, 363-375. doi:10.1037/a0030379

Rozin, P., Hormes, J. M., Faith, M. S., & Wansink, B. (2012). Is meat male? A quantitative multimethod framework to establish metaphoric relationships. *Journal of Consumer Research, 39*, 629-643. doi:10.1086/664970

Ruby, M. B. (2012). Vegetarianism. A blossoming field of study. *Appetite, 58*, 141–150. doi:10.1016/j.appet.2011.09.019

Ruby, M. B. & Heine, S. J. (2011). Meat, morals, and masculinity. *Appetite, 56*, 447-450. doi:10.1016/j.appet.2011.01.018

Schösler, H., de Boer, J., Boersema, J. J., & Aiking, H. (2015). Meat and masculinity among young Chinese, Turkish and Dutch adults in the Netherlands. *Appetite, 89*, 152-159. doi:10.1016/j.appet.2015.02.013

Smil, V. (2002). Eating meat: Evolution, patterns, and consequences. *Population and Development Review, 28*(4), 599–639. doi:10.1111/j.1728-4457.2002.00599.x

Springmann, M., Clark, M., Mason-D'Croz, D., Wiebe, K., Bodirsky, B. L., Lassaletta, L., ... & Willett, W. (2018). Options for keeping the food system within environmental limits. *Nature, 562*(7728), 519-525. doi:10.1038/s41586-018-0594-0

Stein, R., & Nemeroff, C. (1995). Moral overtones of food. Judging others by what they eat. *Personality and Social Psychology Bulletin, 21*, 480–490. doi:10.1177/0146167295215006

Thomas, M. A. (2016). Are vegans the same as vegetarians? The effect of diet on perceptions of masculinity. *Appetite, 97*, 79-86. doi:10.1016/j.appet.2015.11.021

Timeo, S., & Suitner, C. (2018). Eating meat makes you sexy: Conformity to dietary gender norms and attractiveness. *Psychology of Men & Masculinity, 19*(3), 418-429. doi:10.1037/men0000119

Twigg, J. (1983). Vegetarianism and the meanings of meat. In A. Murcott (Ed.), *The sociology of food and eating* (pp. 18-30). Aldershot Haunts, UK: Gower.

Vartanian, L. R. (2015). Impression management and food intake: Current directions in research. *Appetite, 86,* 74–80. doi:10.1016/j.appet.2014.08.021

Williams, K. D., & Nida, S. A. (2011). Ostracism: Consequences and coping. *Current Directions in Psychological Science, 20*(2), 71-75. doi:10.1177/0963721411402480