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Moralistic stereotyping of vegans: The role of dietary motivation and advocacy status

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ABSTRACT

Ambivalent attitudes exist toward vegans: While people may admire vegans' moral aims and commitment, they may also derogate vegans for seeming arrogant and *over*committed. These latter negative perceptions may undermine the effectiveness of efforts to reduce meat consumption for health, animal-welfare, and sustainability benefits. In the present research, we investigated the role of a vegan's motivation (animal ethics vs. health) in moralized attitudes toward vegans among omnivorous participants through two preregistered studies. In Study 1 ($N = 390$), we found that a vegan advocate motivated by animal ethics (vs. health) was seen as more moral but not as more arrogantly overcommitted. In Study 2 ($N = 1177$), we found that animal ethics (vs. health) vegans were seen as both more arrogantly committed and more morally committed, but that relative moral commitment perceptions were attenuated when vegans were described as actively advocating. Both advocating (vs. non-advocating) vegans and animal ethics (vs. health) vegans were generally seen as less socially attractive by omnivores due to stronger attributions of arrogant overcommitment, and a lower social attractiveness was associated with a lower willingness to eat less animal products. Our findings inform ongoing debates within the vegan movement about the effectiveness of signaling moral commitment in promoting plant-based diets.

1. Introduction

Attitudes toward vegans can be markedly ambivalent. On the one hand, vegans may evoke admiration among omnivores for their moral commitment to their vegan diet and lifestyle (De Groeve et al., 2021; Judge & Wilson, 2019). On the other hand, vegans may be subjected to stigmatization for appearing to display moralistic traits indicating arrogance and overcommitment (De Groeve & Rosenfeld, 2022; Markowski & Roxburgh, 2019). This ambivalence in stereotypical impressions has recently been termed the "vegan paradox" (De Groeve and Rosenfeld, 2022) and is theorized to stem from the cognitive dissonance people may feel from eating meat (De Groeve & Rosenfeld, 2022, see also Rothgerber, 2020): Omnivores may view vegans as morally committed because they embody care for animals, but defend their own dietary preferences by negatively stereotyping vegans as arrogantly overcommitted. These attitudes have the capacity to undermine willingness to reduce meat consumption, which is a behavior change conducive to improved health, animal welfare, and sustainability (Willett et al., 2019).

Omnivores' impressions of vegans may depend crucially on vegans' espoused motivation (MacInnis & Hodson, 2017; Vartanian, 2015). Although vegans often have multiple ethical motivations to be vegan – including the environment, social justice and religion (MacInnis & Hodson, 2021; Ruby, 2012), animal ethics motivations are the most common (Janssen et al., 2016; Rosenfeld, 2018) and constitute the primary goal of the vegan movement (Leenaert, 2020; MacInnis & Hodson, 2021). Yet, vegans often strategically downplay their moral commitment to manage social affiliations with omnivores and instead focus on health benefits of veganism to avoid conflict or seeming preachy (Greenebaum, 2012; Paxman, 2016). Health reasons for vegan diets commonly refer to their ability to prevent/reverse many diseases of affluence associated with Western animal-based diets, including heart disease, type 2 diabetes, high cholesterol, obesity, and some forms of cancer (Craig, 2009; Craig & Mangels, 2009). At the same time, some

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vegans may refuse to stay silent about the exploitation and harm animals endure resulting from their consumption as food, regardless of the pushback it may generate among omnivores. These divergent communications among vegans call into question whether one should focus on ethical or health motivations in persuading omnivores to adopt more vegan diets – an unresolved matter that has been the topic of ongoing debates within the vegan movement (Greenebaum, 2015; Leenaert, 2020).

In this article, we tapped into this recurring debate and applied recent theorizing on the vegan paradox (De Groeve & Rosenfeld, 2022) to empirically test whether animal ethics vegans elicit more divergent characterizations (i.e., more morally committed, but also more moralistic) than health vegans. We examined this within a context where omnivores are presented to a vegan who is advocating for plant-based dieting (Study 1 & 2) and a context where a vegan is not actively advocating (Study 2). Below, we develop our hypotheses for Study 1 with regard to omnivores' moralized impressions of animal ethics versus health vegan advocates, along with effects on vegans' social attractiveness and omnivores' willingness to change their diet. Our theorizing commences with one side of the moral(istic) coin: perceived moral commitment.

1.1. Morality commitment

Moral commitment captures two interrelated dimensions of stereotype content: *morality* (Brambilla et al., 2019; Goodwin et al., 2014; Landy et al., 2016) and *commitment* (Piazza et al., 2014). Morality is of primary importance in the impression formation of people (Brambilla et al., 2019; Goodwin et al., 2014) and signifies whether someone's intentions are perceived as helpful or harmful (Landy et al., 2016) – as captured by traits such as kind and fair (Goodwin et al., 2014; Landy et al., 2016; Ruby & Heine, 2011). The commitment dimension captures traits such as determination and dedication, signaling someone's intentional strength (Ajzen et al., 2009) or motivation to attain goals (De Groeve & Rosenfeld, 2022; Piazza et al., 2014).

When comparing animal ethics and health vegan advocates in terms of morality and commitment, it appears obvious that an animal ethics vegan advocate would be seen as especially moral. People generally care about animals (Loughnan et al., 2014; Trethewey & Jackson, 2019), so if advocates raise awareness that animal-product consumption causes damage to animal victims (our studies focused on factory farming), this may evoke negative moral judgements among consumers (Cornish et al., 2016; Hartmann & Siegrist, 2020). Although health advocates may also be perceived as moral because of their intention to help others to become healthier (see Rosenfeld & Burrow, 2017), health reasons are conventionally thought of as personal (Rosenfeld & Burrow, 2017) and there is more ambiguity about the (un)healthiness of vegans and their diets among omnivores (Barnard & Leroy, 2020; Corrin & Papadopoulos, 2017; De Groeve et al., 2021). Therefore, a lower perceived morality could be expected. Because morality traits are seen as intrinsically good (Piazza et al., 2014), we also expected that perceived morality would positively predict social attractiveness (see also De Groeve et al., 2021), and consequently, a higher willingness among omnivores to change their diet (Bashir et al., 2013).

Furthermore, because "more" moral implies a higher motivational strength (Feinberg et al., 2019; Schein & Gray, 2018), we also hypothesized that animal ethics (vs. health) vegan advocates would be seen as more committed. In contrast to morality, though, commitment traits have no clear valence and can amplify either perceived goodness or badness depending on the perceived goals of an agent (e.g., a dedicated eco-fascist; Piazza et al., 2014), so it remained an open research question to us whether commitment perceptions would increase social attractiveness (and willingness to change diet). We did expect, however, in light of previous studies (Bolderdijk et al., 2018; Minson & Monin, 2012), that omnivores may defensively distort moral commitment perceptions of animal ethics (vs. health) vegan advocates into two negatively stereotyped counterparts: *arrogance* and *overcommitment* (De Groeve & Rosenfeld, 2022).

1.2. Arrogance and overcommitment

Arrogance is a personality/character trait (Goodwin et al., 2014; Tiberius & Walker, 1998) associated with narcistic self-aggrandizement, hubristic pride, and low agreeableness (Tracy & Robins, 2007) and can be captured with terms like pretentious and haughty. Arrogance can be construed as a negative reflection of morality (De Groeve & Rosenfeld, 2022): Whereas moral people are helpful and have good intentions, arrogant people believe they are better than others and display disdain toward others (Tiberius & Walker, 1998). The overcommitment dimension can be construed as a negative reflection of commitment, indicating that someone is *too* committed, motivated or dedicated to attaining goals or enacting values (De Groeve & Rosenfeld, 2022). Overcommitment traits, such as fanatical and stubborn, indicate that someone has an obsessive and rigid personality/character (De Groeve & Rosenfeld, 2022).

Although promoting vegan diets does not seem inherently arrogant or overcommitted, when vegans use animal ethics reasons to advocate for vegans diets, they clearly break social norms and confront omnivores with animal harms so that they feel or anticipate moral rejection (De Groeve & Rosenfeld, 2022; Minson & Monin, 2012). Consequently, omnivores may engage in ego-defensive processing by projecting arrogant stereotypes to vegans (De Groeve & Rosenfeld, 2022). Furthermore, stereotyping animal ethics vegan advocates as overcommitted may justify the idea that veganism is superfluous or impossible to maintain (Cole & Morgan, 2011; De Groeve & Rosenfeld, 2022). Similarly, viewing vegans as a cultural threat has been shown to predict negative stereotyping (MacInnis & Hodson, 2017). Carnism – the prevailing belief system of the omnivorous majority that entails the premise of human dominance over animals (Allen et al., 2000; Dhont & Hodson, 2014; Joy, 2009; Monteiro et al., 2017) and legitimizing animal-product consumption as a harmless, cherished given (Graça et al., 2016; Monteiro et al., 2017) – reinforces the idea that vegan advocates lack moral legitimacy to challenge the omnivorous diet and thus justify animal ethics advocacy as moralistic virtue-signaling (De Groeve & Rosenfeld, 2022). In contrast, when compared to a vegan advocate motivated by health reasons, we expected that omnivores would feel less morally judged and stereotype vegans less strongly as arrogant and overcommitted (Weiper & Vonk, 2021). Omnivores may view health vegans more favorably than animal rights vegans (MacInnis & Hodson, 2017); health reasons for vegan diets are more mainstream and perceived as more engaging and credible (Parkinson et al., 2019). Whereas moral persons are highly attractive, arrogant and overcommitted people are more likely to push others away (De Groeve & Rosenfeld, 2022). We thus expected that both perceived arrogance and overcommitment would decrease the advocates' social attractiveness and, consequently, omnivores' willingness to change their diet.

2. Study 1: animal ethics versus health vegan advocacy

To summarize, we expected that animal ethics (vs. health) vegan advocates may be perceived as more moral and committed, which would positively affect their social attractiveness via perceived morality, but also as more arrogant and overcommitted, which would have a stronger negative effect on omnivores' willingness to affiliate with them and to change their diet. Fig. 1 gives a conceptual overview of our hypotheses for Study 1, which were preregistered on Open Science Framework (OSF): https://osf.io/9y72z. In the following section, we describe our methodology. All measures, manipulations, and exclusions are reported and we clearly distinguish between confirmatory and exploratory analyses.

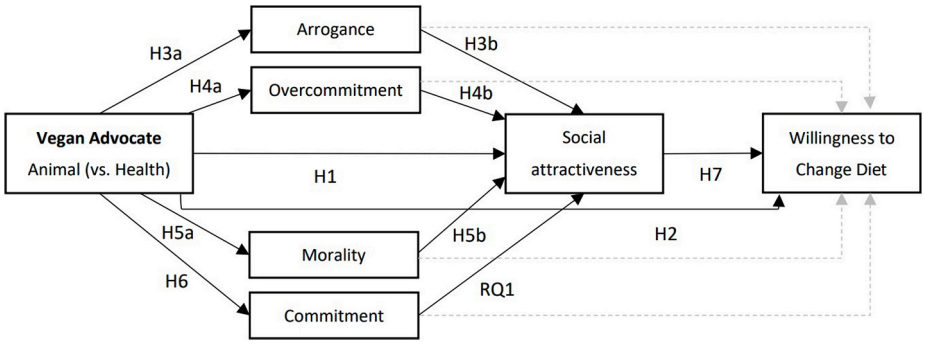

Fig. 1. *Conceptual Overview of Our Hypotheses. Note.* H1-7 indicate our hypotheses. RQ1 is a research question.

2.1. Methods

2.1.1. Participants

We calculated that we needed at least 200 participants for the exploratory factor analyses (EFAs) we planned, but aimed to recruit 400 participants (see our preregistration for a justification). Participants were recruited via Prolific (May 2020) and were prescreened for eligibility based on the following inclusion criteria: UK nationality, good reputation on Prolific (≥20 submissions and an approval rate of at least 95%) and not following a vegetarian or vegan diet. Participants had to be 18–100 years old.

In total, 443 participants started the survey, of which 8 returned their submission and 2 timed out. Based on disclosed exclusion criteria, 33 participants (7.6% of the remaining 433; $n_{\text{health}} = 16$; $n_{\text{animal ethics}} = 17$) were rejected without payment because they failed the manipulation check (see below). Although Prolific users who follow a vegetarian or vegan diet were not invited for participation, 10 participants did *not* indicate eating meat (red meat, poultry, fish or seafood) at least occasionally and were therefore excluded from analysis. After data cleaning, the final sample thus included 390 participants in total ($n_{\text{health}} = 192$; $n_{\text{animal ethics}} = 198$). Table 1 gives a demographic overview of this sample (Study 1 column). We did not find significant differences in demographic or diet-related variables across conditions; random allocation was effective.

2.1.2. Procedure and stimuli

Upon providing informed consent, participants were randomly allocated to answer questions about a vegan advocate motivated by either animal ethics or health. Participants read the following description: "Jane follows a vegan diet and thus avoids eating animal products (red meat, poultry, fish, seafood, dairy and egg). She advocates for vegan dieting by showing people how eating animal products is associated with:

- "health issues such as an increased risk of heart disease and type 2 diabetes" [health vegan advocate, coded 0]
- "animal rights/welfare issues such as the confinement and harmful treatment of animals in factory farms" [animal ethics vegan advocate, coded 1]

Next, participants completed study measures, and at the end, participants were thanked and debriefed about the purpose of the study.

2.1.3. Measures

2.1.3.1. Trait attributions. Participants rated Jane along 30 traits. Measured scales included: arrogance, overcommitment, morality, and commitment for the confirmatory analyses, as well as sociability, eccentricity, and perceived healthiness for exploratory analyses (see preregistration). All trait attributions were measured using 7-point unipolar scales (1 = *Not at all*, 4 = *Neutral*, 7 = *Extremely*), and all scale items were pooled and randomized across five pages.

Table 1
Demographics of UK Samples for Study 1 and Study 2.

Variable	Category	% in Study 1 (*n*)	% in Study 2 (*n*)
Gender	Male	41.0 (160)	39.2 (461)
	Female	59.0 (230)	60.4 (711)
	Prefer not to say		0.1 (1)
	Prefer to self-describe		0.3 (4)
Age	*M* (*SD*)	36.48 (13.13)	37.90 (13.57)
	18–27	22.3 (92)	27.2 (318)
	28–37	31.8 (131)	29.4 (346)
	38–47	26.2 (108)	18.3 (217)
	48–57	11.7 (48)	14.3 (169)
	>58	8.0 (33)	11.0 (127)
Ethnicity	White	88.5 (345)	87.3 (1028)
	Black	2.8 (11)	2.2 (26)
	Asian	5.6 (22)	6.5 (76)
	Mixed	2.6 (10)	3.6 (42)
	Other	0.5 (2)	0.4 (5)
Education	No formal	0 (0)	0.3 (4)
	Secondary school	15.6 (61)	11.8 (139)
	College	26.7 (104)	29.8 (351)
	Undergraduate	41.3 (161)	41.4 (487)
	Graduate	13.6 (53)	14.4 (170)
	Doctorate	2.8 (11)	2.2 (26)
Income	< £10,000	22.1 (86)	19.6 (231)
	£10,000 - £19,999	19.0 (74)	21.7 (255)
	£20,000 - £29,999	23.8 (93)	27.2 (320)
	£30,000 - £39,999	14.4 (56)	13.8 (162)
	£40,000 - £49,999	6.2 (24)	5.8 (68)
	£50,000 - £59,999	3.1 (12)	2.8 (33)
	£60,000 or more	2.3 (9)	4.3 (51)
	Prefer not to say	9.2 (36)	4.8 (57)
MCF	*M (SD)*	4.65 (1.77)	4.71 (1.76)
Flexitarian	No	48.7 (190)	45.3 (533)
	Yes/Partly	51.3 (200)	54.7 (644)
Semi-vegetarian	No	66.2 (258)	68.6 (807)
	Yes	33.8 (132)	31.4 (370)
Carnism	*M (SD)*	2.76 (0.80)	2.72 (0.81)

Note. n.d. = no data. MCF = meat consumption frequency (number of days/week when meat is eaten at main meal).

Confirmatory Trait Attributions. We developed scales (each five items in length) to measure *arrogance* (e.g., arrogant, smug), *overcommitment* (e.g., fanatical, stubborn), *morality* (e.g., ethical, kind-hearted), and *commitment* (e.g., dedicated, motivated). Initial items for these scales were derived from past literature (Broome, 1983; Piazza et al., 2014; Ruby & Heine, 2011; Tracy & Robins, 2007) and were evaluated for face validity by the authors and research colleagues. After data collection, the psychometric validity of the scales was assessed using exploratory factor analyses (EFAs) according to a preregistered procedure informed by Costello and Osborne (2005). Based on this procedure, we excluded one item ("virtuous") from the morality scale based on the criterium that all item loadings should be greater than 0.50.

In addition, we found that the arrogance and overcommitment items loaded together on a single factor, so for subsequent analyses we decided to use a composite arrogant overcommitment scale, after excluding one item ("uncompromising" loaded below 0.50). For more details about the EFAs, we refer to our supplementary materials (§1.1 and Table S1). The three final scales for morality, commitment, and arrogant overcommitment had good internal consistencies (respective α′s were 0.80, 0.84, and 0.92).

Exploratory Trait Attributions. We used a five-item scale to measure *sociability* (e.g., friendly, sociable) with relevant traits derived from Goodwin et al. (2014), a three-item scale to measure *eccentricity* (eccentric, odd, unconventional) with relevant traits derived from Bashir et al. (2013), and a two-item scale to measure *healthiness* (healthy, physically fit) derived from De Groeve et al. (2021). Respective α′s were 0.78, 0.69, and 0.71.

2.1.3.2. Social attractiveness. We used a six-item scale (α = 0.93) to measure the social attractiveness of the vegan advocate Jane with items adapted from the Interpersonal Attraction Questionnaire (Montoya & Horton, 2004). Example items include "I would like to meet Jane" and "Jane would probably not make a good friend to me" (reverse-scored item); responses ranged from 1 (*Strongly disagree*) to 7 (*Strongly agree*).

2.1.3.3. Willingness to change diet. We used an eight-item scale (α = 0.91) to measure participants' willingness to change diet. Four items from a scale called Openness to Going Vegetarian (Rosenfeld & Tomiyama, 2020) were adapted by replacing the terms "vegetarian" and "meat" with "vegan" and "animal products," respectively. These items were selected because they captured radical change (e.g., "I am open to eating a vegan diet"). Another four-item scale measuring willingness to reduce meat consumption (Jansen, 2016) was adapted to reflect reducetarian options for dietary change. Although we conceived willingness to change diet as a single factor based on our preregistered criteria (all item loadings ≥0.50), we note that EFA (extraction method: *principal axis*; rotation: *direct oblimin*) also supported a distinction between the four radical change items (α = 0.85) and the four reducetarian change items (α = 0.90) based on the Kaiser extraction rule.

2.1.3.4. Manipulation check & COVID-19-related anxiety. We included a manipulation check to assess whether participants read the description of the advocate carefully. Participants were asked to check the box that described the reason why Jane advocated for vegan dieting. Answer options referred to: (a) animal rights/welfare issues (…), (b) health issues (…), (c) environmental issues (…), or (d) social justice issues (…). The latter two options were included as distractors to minimize the chance that participants would answer correctly by accident.

Using a scale adapted from Marteau and Bekker (1992), we measured how anxious participants felt when thinking about COVID-19 with responses ranging from 1 (*Not at all*) to 4 (*Neutral*) to 7 (*Extremely*) (α = 0.93).

2.1.3.5. Demographics and diet-related variables. Demographic information included: gender, age (open text box), highest level of education, ethnicity, and income. Based on Rosenfeld and Burrow (2018), dietary pattern was assessed by asking participants to select all of the following types of food that they eat at least occasionally: red meat, poultry, fish and seafood, dairy, and egg. An option "I generally do not eat any of the above" was also provided. This measure allowed to exclude vegetarians or vegans from our analysis. Lastly, we asked participants to indicate how many days a week they eat meat with their main meal (including red meat, poultry, fish and seafood), using a dropbox with answers ranging from 0 to 7 (measuring meat consumption frequency), and we asked whether they already consciously reduced their meat intake before taking the survey, with answers "yes," "partly" (1 = flexitarian) or "no" (0 = non-flexitarian). We used the inventory from Monteiro et al. (2017) to measure carnism endorsement (α = 0.76).

See OSF for the full survey questionnaire: https://osf.io/3aq9n/.

2.1.4. Analysis

Our preregistered analysis plan, including deviations from it, is available via the OSF-link above. In the Results section, we refer to our hypotheses using the numbering in Fig. 1. Because arrogance and overcommitment were treated as a composite measure, we instead tested the hypotheses whether the animal ethics (vs. health) vegan advocate was perceived as more arrogantly overcommitted (H3/4a: composite of H3a and H4a), and whether this variable predicted a lower social attractiveness (H3/4b: composite of H3b and H4b). Analyses based on arrogance and overcommitment as separate scales did not yield distinct results. We used Cohen's *d* to express the size of the difference between means using Cohen's (1988) rules of thumb for effect sizes *d* = 0.20 (small), *d* = 0.50 (medium), *d* = 0.80 (large). All analyses were conducted using IBM SPSS Statistics 26. The SPSS macro PROCESS version 3.5 was used to perform mediation and moderation analyses (Hayes, 2018). We used PROCESS to estimate unstandardized model coefficients, standard errors, *t* and *p* values, and confidence intervals based ordinary least squares (OLS) regression. We used heteroscedasticity-consistent standard errors (HC3), as recommended by Hayes and Cai (2007), to correct for heteroscedasticity in the errors of estimation. PROCESS was also used to estimate indirect effects based on 95% percentile-based bootstrap confidence intervals (BootCI) using 10,000 bootstrap samples. We refer to Table S2 in the supplementary materials for an initial correlation analysis of study variables.

Table 2
Comparison between Health and Animal Ethics Vegan Advocate for Outcome Variables.

	Health (n = 192)	Animal ethics (n = 198)			
Confirmatory Variables	*M (SD)*	*M (SD)*	*t* (388)	*p*	*d*
Social attractiveness	3.93 (1.24)	3.90 (1.18)	0.24	.813	0.02
Willingness to change diet	4.07 (1.23)	4.00 (1.34)	0.60	.546	0.05
Arrogant overcommitment	4.09 (1.22)	4.03 (1.23)	0.50	.615	0.05
Morality	5.00 (0.96)	5.27 (0.84)	−2.99	.003**	0.30
Commitment	5.86 (0.79)	5.88 (0.71)	−0.32	.748	0.03
Exploratory Traits	*M (SD)*	*M (SD)*	*t* (388)	*p*	*d*
Sociability[a]	4.00 (0.75)	4.07 (0.75)	−0.86	.388	0.09
Eccentricity	3.61 (1.12)	3.77 (1.22)	−1.35	.177	0.14
Healthiness[a]	4.84 (0.98)	4.65 (0.93)	1.88	.060†	0.20

Note. [a] Kurtosis was evident in both conditions for perceived sociability (2.98 and 2.05) and healthiness (1.26 and 1.27). †$p < .10$, *$p < .05$, **$p < .01$.

2.2. Results

2.2.1. Animal ethics vegan advocate seen as more moral (but less healthy?)

To assess whether there were differences in social attractiveness (H1), willingness to change diet (H2), perceived arrogant overcommitment (H3/4a), morality (H5a), commitment (H6), and the exploratory trait attributions (sociability, eccentricity, healthiness) between animal ethics and health vegan advocates, we used independent *t* tests. Levene's tests indicated that the homogeneity assumption was met for all the outcomes, $Fs(1, 390) \leq 2.318$, $ps \geq .129$. As can be seen in Table 2, the only significant finding was that the animal ethics (vs. health) advocate was perceived as more moral (small-medium effect), so only H5a was supported (H1, H2, H3/4a and H6 not). The health (vs. animal ethics) vegan advocate was perceived as healthier, though the difference was small and only marginally significant. We did not find significant differences for the remaining variables, with participants scoring rather neutral on average (except for commitment).

Concerning willingness to change diet, a separate exploratory paired sample *t* test revealed that participants were more willing to reduce their consumption of animal products ($M = 4.65$, $SD = 1.41$) rather than radically change their diet ($M = 3.42$, $SD = 1.40$), $t(389) = -21.28$, $p < .001$, $d = 0.88$.

2.2.2. Mediation analysis

2.2.2.1. Step 1. In order to test H3/4b and H7, we tested the preregistered mediation model (p. 14 in our OSF-preregistration; PROCESS model 6) for the effect of vegan advocate type on willingness to change diet via arrogant overcommitment (fused as first mediator) and social attractiveness (second mediator). Results of this analysis are shown in Fig. 2 (Step 1). Consistent with the results of the *t* tests (Table 2), advocate type did not have a significant effect on arrogant overcommitment, $a_{AO} = -0.06$, $SE = 0.12$, $t(388) = -0.50$, $p = .616$, or social attractiveness, $a_{SA} = -0.07$, $SE = 0.09$, $t(387) = -0.75$, $p = .452$. In line with H3/4b, however, we found that arrogant overcommitment negatively predicted social attractiveness, $b_{AO} = -0.66$, $SE = 0.04$, $t(387) = -15.00$, $p < .001$, which in turn positively predicted participants' willingness to change diet, $d_{SA} = 0.39$, $SE = 0.06$, $t(386) = -5.76$, $p < .001$, consistent with H7. Arrogant overcommitment predicted willingness to change diet indirectly via social attractiveness, $IE = -0.25$, $BootSE = 0.05$, 95% BootCI [−0.35, −0.17], not directly, $d_{AO} = -0.05$, $SE = 0.06$, $t(386) = -0.76$, $p = .438$. Three separate exploratory analyses (details not shown for brevity) revealed that this indirect effect of arrogant overcommitment on willingness to change diet was robust against the effect of including as additional covariate predictors to the model sociability, eccentricity, and perceived healthiness, $IE = -0.11$, $BootSE = 0.03$, 95% BootCI [−0.18, −0.06], the demographic variables gender, age, education, ethnicity, and income, $IE = -0.24$, $BootSE = 0.05$, 95% BootCI [−0.34, −0.15], and COVID-related anxiety, $IE = -0.25$, $BootSE = 0.05$, 95% BootCI [−0.34, −0.16].

2.2.2.2. Step 2. In order to assess H5b and RQ1, we included perceived morality and commitment as parallel mediators to the preregistered mediation model described in Step 1, using PROCESS model 80. Results shown in Fig. 2 (Step 1 + 2) suggest that the higher perceived morality of the animal ethics (vs. health) vegan advocate, $a_{Mor} = 0.27$, $SE = 0.09$, $t(388) = 2.97$, $p < .003$, predicted a higher social attractiveness (consistent with H5b), $b_{Mor} = 0.34$, $SE = 0.07$, $t(385) = 5.19$, $p < .001$, which in turn predicted a higher willingness to change diet, $d_{SA} = 0.35$, $SE = 0.07$, $t(384) = 5.07$, $p < .001$. This indirect effect of vegan advocate type on willingness to change diet was significant, $IE = 0.03$, $BootSE = 0.02$, 95% BootCI [0.01, 0.07]. Perceived morality only predicted willingness to change diet indirectly via social attractiveness, not directly, $d_{Mor} = 0.11$, $SE = 0.08$, $t(384) = 1.32$, $p = .186$. In contrast, perceived commitment did not have any direct effect on social attractiveness (answering RQ1), $b_{Com} = 0.02$, $SE = 0.07$, $t(385) = 0.26$, $p = .797$, or willingness to change diet, $d_{Com} = -0.02$, $SE = 0.09$, $t(384) = -0.21$, $p = .836$, and consistent with the *t* test in Table 2, vegan advocate types did not significantly differ in terms of commitment, $a_{Com} = 0.02$, $SE = 0.08$, $t(388) = 0.32$, $p = .749$, so there was no evidence for indirect effects via perceived commitment.

2.2.3. Exploratory mediation analysis: diet-related variables

Lastly, we performed separate exploratory mediation analyses (PROCESS model 6), which indicated that flexitarians (vs. non-flexitarians) and those who eat less meat were more likely to affiliate with the vegan advocates, an effect fully mediated by both carnist beliefs and perceptions of arrogant overcommitment. In particular, a lower

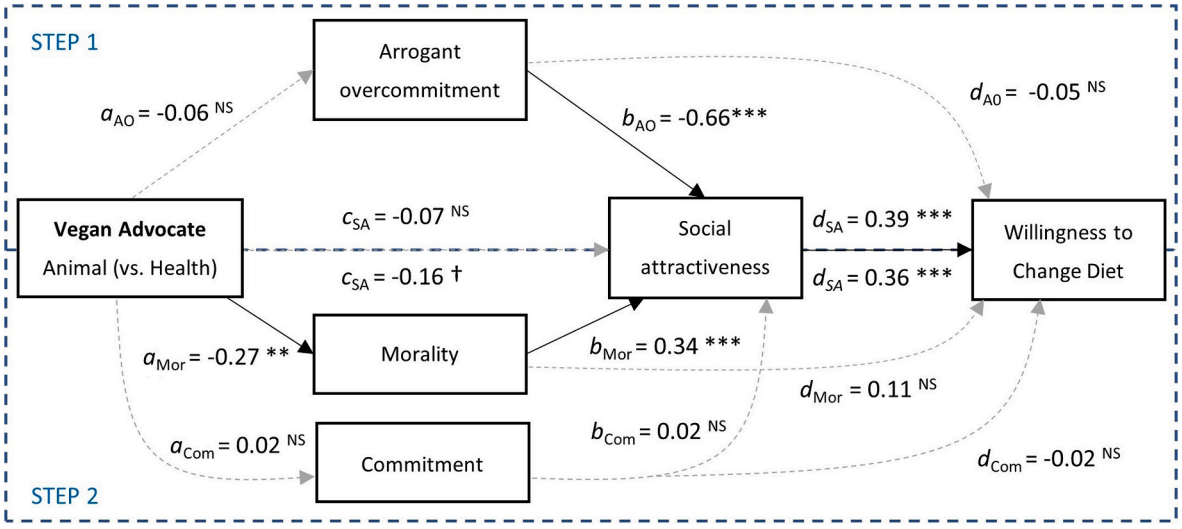

Fig. 2. *Results of Mediation Analyses Step 1 and Step 2*

Note. Unstandardized regression coefficients are noted and grey dashed arrows indicate insignificant effects for both steps. In Step 1, arrogant overcommitment and social attractiveness are specified as serial mediators of the effect of vegan advocate type on willingness to change diet. In Step 2, morality and commitment are added as parallel mediators of arrogant overcommitment (all regression coefficients are shown, apart from the downstream effects of arrogant overcommitment which became slightly smaller: $b_{AO} = -0.57$ *** and $d_{A0} = -0.04$ NS). Significant indirect effects are described in the text. NS $p \geq .10$, †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

endorsement of carnist beliefs predicted higher social attractiveness, partially explained by lower perceptions of arrogant overcommitment. For details about these analyses, see Table S3 in the supplementary materials.

2.3. Discussion

In Study 1, we examined omnivores' responses to a vegan advocate motivated by animal ethics reasons versus health reasons. In line with our expectations, the animal ethics (vs. health) vegan advocate was perceived as more moral, which was associated with a higher social attractiveness and, consequently, a higher willingness to change diet among omnivore targets. The animal ethics (vs. health) vegan advocate was also perceived as marginally less healthy. Consistent with our hypothesizing, we also found that higher ratings for arrogance and overcommitment – as a composite measure – robustly predicted lower social attractiveness and lower willingness to change diet. Perceived commitment did not have any relationship with social attractiveness or willingness to change diet (answering RQ1).

Contrary to our expectations, factor analysis suggested that arrogance and overcommitment traits could not be separated, and overall, we found that omnivores did not respond differently to the advocate types in terms of arrogant overcommitment, social attractiveness, or willingness to change (and also sociability and eccentricity). It seems that the measures that were most closely associated with our manipulation (morality and healthiness) generated the largest effects, with small-medium effect sizes. Our findings therefore contradict previous findings that animal-motivated vegans and pro-vegan animal messages generate less favorable responses among non-vegans compared to health-motivated vegans and messages (MacInnis & Hodson, 2017; Parkinson et al., 2019; Weiper & Vonk, 2021).

To explain these contradicting findings, it is informative to compare our study design with that of MacInnis and Hodson (2017). In their study, participants were simply asked to evaluate "vegans for animal rights (/health) reasons". In our study, however, we compared omnivores' perceptions of *advocates* for vegan dieting (not simply ordinary vegans) motivated by animal versus health reasons, which were also explicitly described as avoiding *animal* products. First, it is possible that this "animal" cue in our description made the meat paradox (Kunst & Hohle, 2016) and the stereotypical view of vegans as animal rights advocates (Parkinson et al., 2019) more salient in our description of the health vegan advocate, making it less distinguishable from our description of the animal ethics vegan advocate. Second, recent studies on vegan advocacy cast doubt on our original hypotheses and suggest that the act of advocacy itself might attenuate omnivores' responses toward animal ethics versus health vegans. For example, a recent study by Phua et al. (2019) found that meat-eaters did not respond differently to a (celebrity) vegan promoting veganism for altruistic reasons (animal ethics and the environment) versus egoistic reasons (health) in terms of intention to become vegan (see also Phua et al., 2020). One could reason that omnivores are more concerned about maintaining their diet, irrespective of animal and health motivations that oppose it (Trethewey & Jackson, 2019). Nevertheless, some studies did find differences in evaluations of morally motivated advocates, being more negative if advocates were presented as "typical" (vs. atypical) (Bashir et al., 2013) and if the participants were self-involved (vs. uninvolved) (Bolderdijk et al., 2018). These explanations informed Study 2.

3. Study 2: does advocacy status attenuate perceived differences between animal ethics and health vegans?

The aim of Study 2 was to test whether the act of advocacy attenuates perceived differences between animal ethics and health vegans by comparing omnivores' perceptions toward advocating animal ethics and health vegans with *non*-advocating ones. Animal ethics (vs. health) vegans were expected to evoke more divergent characterizations (more moral, more arrogantly overcommitted) and less social attraction, but only when they are described as non-advocating. We thus manipulated both vegan *motivation* (animal ethics versus health) and vegan *advocacy* (present versus absent). In doing so, we also tested whether our findings of Study 1 were replicable when using new experimental manipulations in which cues to "animal" products were avoided (referring to meat, dairy, and eggs instead) and in which advocacy was manipulated more strongly.

Central to Study 2 was a hypothesized interaction effect between a vegan's motivation and advocacy status on their social attractiveness (H1) and arrogant overcommitment (H2a). In line with Study 1, we expected that omnivores would perceive animal ethics (vs. health) vegans as more arrogantly overcommitted and that this would have a negative effect on social attractiveness (H2b). However, we hypothesized that these effects would only occur when vegans are described as non-advocating (cf. MacInnis & Hodson, 2017), while no perceived differences were expected for advocating vegans (see results Study 1). In addition, we expected that advocating vegans would be perceived as more arrogantly overcommitted and less socially attractive compared to non-advocating vegans, because the act of advocacy directly challenges majority norms. We expected that the non-advocating animal ethics (vs. health) vegan would be perceived as more akin to both advocating vegans in terms of arrogant overcommitment and social attractiveness. The form of these hypothesized interactions can be found in our preregistration of Study 2 on OSF (p. 1–2): https://osf.io/a3hm9/.

Concerning morality, we hypothesized an interaction effect between vegan motivation and advocacy status (H3a), namely that an animal ethics (vs. health) vegan would be perceived as more moral, but that the difference in perceived morality would be smaller when a vegan is described as advocating (vs. non-advocating). We did not preregister expectations with regard to the form of the interaction. In line with Study 1, we hypothesized that morality would have a positive effect on social attractiveness (H3b). In this study, however, we also hypothesized that perceived arrogant overcommitment would have a negative effect on perceived morality (H3c) based on previous findings that moralistic stereotypes may (partly) downplay moral impressions (De Groeve et al., 2021). This negative effect may (partly) explain why the difference in perceived morality would be smaller between advocating vegans compared to non-advocating ones.

Concerning commitment, we expected that an advocating vegan would be perceived as more committed than a non-advocating one (H4), because advocacy indicates a higher dedication to attain goals; though we did not have a clear expectation as to whether vegan motivation and advocacy status would interact to predict perceived commitment (RQ1). We expected that perceived commitment would not differ between animal ethics and health vegan advocates (see Study 1) and that a non-advocating animal ethics (vs. health) vegan would be perceived as more akin to the advocates in terms of commitment (this hypothesis was not preregistered). In line with Study 1, we expected no effect of perceived commitment on social attractiveness and therefore did not formulate any hypothesis to test this effect.

Lastly, concerning willingness to change, we expected that omnivores would not respond differently to animal ethics versus health vegan advocates (see Study 1: there was an indirect effect via morality, but no full mediation), and we had no clear expectations as to how omnivores would respond to non-advocating animal ethics versus health vegans, so it remained an open question to us how omnivores would respond to the conditions in terms of willingness to change diet (RQ2). We did expect, however, that social attractiveness would have a positive effect on willingness to change diet (H5; see also Study 1). We also added some exploratory variables (see §3.1.3 Measures).

Fig. 3 gives a conceptual overview of our hypotheses for Study 2, which were also preregistered (see p. 1–2 of our OSF-preregistration).

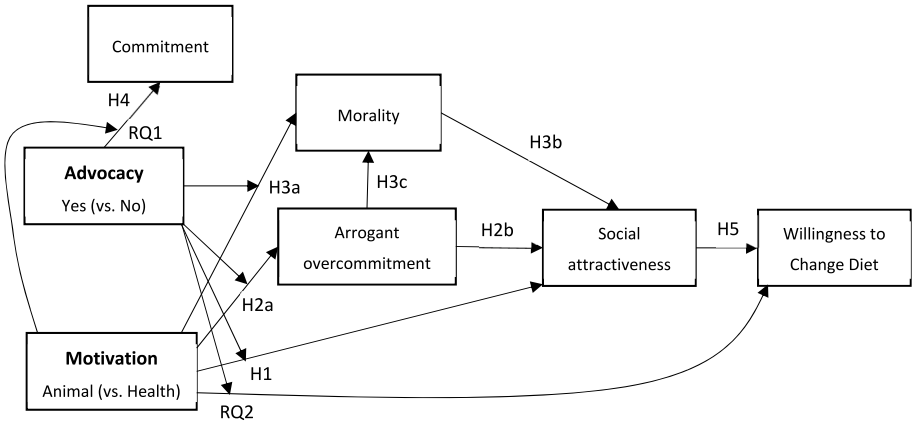

Fig. 3. *Conceptual Overview of our Hypotheses for Study 2*
Note. Our hypotheses (H1-5) and research questions (RQ1 and RQ2) were tested in several steps, following our preregistered analysis plan. Because of this, and due to deviations from the plan, the figures in the Results section (§3.2, notably Figs. 5 and 6) do not exactly correspond with this figure.

3.1. Methods

3.1.1. Participants

To test our hypotheses, a sample of UK omnivorous participants were recruited via Prolific (January 2021). To estimate the sample size needed, we performed power simulations for interactions in 2 × 2 between-subjects factorial designs using the Shiny web app of White II (https://markhw.shinyapps.io/power_twoway/). Our power analysis indicated that we needed a total sample size of 800 to allow to detect our hypothesized interaction effects for social attractiveness and arrogant overcommitment with a power of .80 at a standard 0.05 alpha error probability (for more details, see p. 6–7 of our preregistration). To further improve the power of our analyses, we aimed to gather a sample of 1200 participants (about 300 per condition). The same inclusion criteria as in Study 1 were used to prescreen Prolific volunteers for eligibility, with the addition that Study 1 participants were ineligible.

In total, 1316 participants started the survey, of which 17 stopped early in the survey (5 at the beginning, 12 before the manipulation checks) and either returned their submission (11) or were timed out (6). Based on disclosed exclusion criteria, 97 participants (7.5% of the remaining 1299) were asked to return their submission because they failed the motivation-manipulation check. One participant failed the two attention checks and another participant returned their submission after finishing the survey. Of the 1200 remaining participants who completed the survey, 23 participants did *not* indicate eating meat (red meat, poultry, fish or seafood) at least occasionally. Based on their indicated dietary pattern, four were dietary vegan and the remaining (19) were non-vegan vegetarians. As in Study 1, we excluded these participants from our analysis. Following our preregistration, four participants that were timed out but completed the survey were retained. After data cleaning, the final sample included 1177 participants, more or less equally distributed across conditions ($n_{\text{animal, no advocacy}} = 298$; $n_{\text{health, no advocacy}} = 306$; $n_{\text{animal, advocacy}} = 294$; $n_{\text{health, advocacy}} = 302$). As can be seen in Table 1, the demographics of the Study 2 sample were highly similar to those in Study 1 in terms of gender (60.4% female), age (range from 18 to 86; $M_{\text{age}} = 37.90$; $SD = 13.57$), ethnicity, education, income, and diet-related variables (meat consumption frequency, flexitarian and semi-vegetarian status, carnism). These variables did not significantly differ across conditions, apart from flexitarian status.

3.1.2. Procedure and stimuli

Upon providing informed consent, participants were randomly allocated to answer questions about one of four conditions, namely Jane as an animal ethics or health vegan (factor motivation, coded 1 and 0, respectively) that was either advocating or not (factor advocacy status, coded 1 and 0, respectively). The stimuli for motivation were the same as in Study 1, but we removed cues to "animal" products to manipulate animal ethics versus health motivation more dissimilarly, referring to meat, dairy, and eggs instead. We included a non-advocating condition and strengthened the description of advocating Jane. More specifically, we used identity-first language ("Jane is a vegan advocate") instead of person-first language ("Jane follows a vegan diet (…). She advocates for (…)") and emphasized that the vegan advocate "publicly supports" plant-based products and "actively advocates for" a plant-based diet, while the non-advocating vegan was described as merely eating a plant-based diet. We used the term "plant-based" diet because it is more descriptive than "vegan" diet. These multiple changes allowed us to challenge the replicability of Study 1 and test the attenuating effect of advocacy more strongly but with the consequence that we would not be able to readily attribute potential differences between the studies to one variable. Participants read the following description:

"Jane is a **vegan** [advocate], so she **only eats** [/publicly supports eating] plant-based products and avoids eating meat, dairy and eggs. She **eats** [/actively advocates for] a plant-based diet to prevent" [stimuli for advocating vegan between brackets]:

- "health issues such as an increased risk of heart disease and type 2 diabetes" [health motivation]
- "animal rights/welfare issues such as the confinement and harmful treatment of animals in factory farms" [animal ethics motivation]

Participants were asked to proceed if they had a picture of Jane in their mind. Next, participants were exposed to our measures, and at the end, participants were thanked and debriefed. Our manipulations were effective (see the supplementary materials §2.1 and Table S4 for more details on our manipulation checks).

3.1.3. Measures

Apart from a manipulation check for advocacy status, a control variable measuring perceived persuasiveness instead of COVID-19-related Anxiety and the inclusion of additional control variables downstream in the survey, the measures of Study 2 were the same as in Study 1.

3.1.3.1. Trait attributions, social attractiveness and willingness to change diet. Participants rated 28 traits using 7-point unipolar scales (1 = *Not at all*, 4 = *Neutral*, 7 = *Extremely*) based upon how well they matched their perception of Jane, with all scale items being pooled and randomized across five pages. These traits were derived from Study 1 with the exception that we excluded the traits "virtuous" and "uncompromising"

because they did not load on their respective factors. EFA indicated that the three scales for morality (α = 0.83), commitment (α = 0.83), and arrogant overcommitment (α = 0.92) were again separable (all loadings >0.57). The other variables had good internal consistencies: sociability (α = 0.84), eccentricity (α = 0.72), healthiness (α = 0.73), social attractiveness (α = 0.93), and willingness to change diet (α = 0.91), including radical change (α = 0.87) and reducetarian change (α = 0.89).

3.1.3.2. Perceived persuasiveness. Instead of measuring COVID-related anxiety, we asked participants about the persuasiveness of Jane's reasons for eating/advocating for a plant-based diet using a 7-point scale from Yoon et al. (2016) consisting of 3 items: Very weak – Very strong, Not at all convincing – Very convincing, Not at all persuasive – Very persuasive (α = 0.91). Because this measure followed the motivation manipulation check, omnivores were primed to compare the persuasiveness of different motivations.

3.1.3.3. Demographics and diet-related variables. Demographic variables (gender, age, highest education level, ethnicity, and income) and diet-related variables (dietary pattern, meat consumption frequency, flexitarian status, carnism) were measured in the same way as in Study 1. However, before measuring carnism (α = 0.78), we also measured omnivore identification using a single item inspired by Allen et al. (2000) and Rosenfeld et al. (2019).

3.1.3.4. Personal-health and animal-welfare values. Lastly, we measured personal-health values (e.g., "I care about the health of my body") and animal-welfare values (e.g., "I am against animal cruelty") using three-item scales from Trethewey and Jackson (2019), with responses ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The measures had a good reliability (α = 0.82 and α = 0.80). Participants valued personal health quite strongly (M = 5.07; SD = 1.03), but animal-welfare values were more strongly (and uniformly) endorsed (M = 6.14; SD = 0.85) and this difference was highly significant according to a Paired Sample t-test, t (1176) = 29.60, $p < .001$.

See OSF for the full survey questionnaire: https://osf.io/a3hm9/.

3.1.4. Analysis

Our preregistered analysis plan, with mention of deviations from the plan, is available via the OSF-link above (p. 3–6 in the preregistration). In the Results section, we refer to our hypotheses using the numbering in Fig. 3. We used SPSS to calculate two-way between-subjects ANOVAs to test interaction effects, which allowed to assess H1, H2a, H3a, H4, RQ1 and RQ2 (§3.2.1). To assess H2b, H3b, H3c and H5, we calculated (moderated) mediation models (§3.2.2) using PROCESS. We used the same settings and methods for statistical inference as in Study 1 and continuous predictors in moderation models were mean-centered (Hayes, 2018). We refer to Table S5 in the supplementary materials (§2.3) for an initial correlation analysis of study variables.

3.2. Results

3.2.1. Test of interaction effects

To test whether advocacy status (present versus absent) moderated the effect of motivation (animal ethics versus health) on social attractiveness (H1), arrogant overcommitment (H2a), morality (H3a), commitment (RQ1), willingness to change (RQ2) as well as perceived persuasiveness and the exploratory trait attributions (sociability, eccentricity, healthiness), we conducted 2 (motivation: animal ethics vs. heath) x 2 (advocacy: yes vs. no) between-subjects ANOVAs (see Table 3 for results). The ANOVA for commitment also allowed to assess H4. Levene's test indicated that the homogeneity assumption for ANOVA was violated for social attractiveness, $F(3, 1273) = 6.130$, $p = .001$, and for sociability, $F(3, 1273) = 3.567$, $p = .014$. For these variables, we performed ANOVAs using a heteroscedasticity-consistent standard errors estimator to account for the homogeneity violation (HC3; Hayes & Cai, 2007). Although normality was violated for most variables, we assumed that the ANOVAs were robust against violations of normality because our sample sizes were larger than 30–40 (Ghasemi & Zahediasl, 2012). In addition, although we calculated both main and simple effects for completeness, we only interpreted simple effects when there was an interaction and we only interpreted main effects when there was no interaction. Main and simple effects are both reported as mean differences (M_{diff}) and effect sizes as Cohen's d to ease comparison and interpretability. Partial eta-squared (η_p^2) was used to express the effect size of interaction effects in ANOVA using rules of thumb derived from Cohen (1988), $\eta_p^2 \approx 0.01$ (small), $\eta_p^2 \approx 0.06$ (medium), and $\eta_p^2 \approx 0.14$ (large). Fig. 4 shows bean plots for the study variables across conditions (plots were made in *R* using the *yarrr* package). In the next subsections, we describe the results (H1, H2a, H3a, H4, RQ1 and RQ2) for our confirmatory variables (§3.2.1.1) and for our exploratory variables (§3.2.1.2) based on Table 3 and Fig. 4. Results with or without outliers showed similar patterns of significance (see supplementary materials §2.2).

3.2.1.1. Confirmatory variables. **Social Attractiveness and Arrogant Overcommitment**. For social attractiveness and arrogant overcommitment, we did not find an interaction effect between advocacy status and motivation (Table 3). However, we did find significant main effects of advocacy status and motivation on both social attractiveness and arrogant overcommitment. As can be seen in Fig. 4a and b, the advocating vegans were perceived as less socially attractive (M = 4.03; SD = 1.27) and more arrogantly overcommitted (M = 4.14; SD = 1.30) compared to the non-advocating vegans (social attractiveness: M = 4.37; SD = 1.12; arrogant overcommitment: M = 3.77; SD = 1.19), and vegans motivated by animal ethics were perceived as less socially attractive (M = 4.12; SD = 1.25) and more arrogantly overcommitted (M = 4.05; SD = 1.26) compared to those motivated by health (social attractiveness: M = 4.29; SD = 1.16; arrogant overcommitment: M = 3.85; SD = 1.25), independent of their advocacy status. H1 and H2a were thus partially supported, while two of our original hypotheses in Study 1 (H1 and H3/4a in Fig. 1) were supported independent of advocacy status.

Morality and Commitment. For perceived morality, our hypothesized spreading interaction (H3) between advocacy status and motivation was supported (Table 3). For commitment, we also found a small but significant interaction effect between advocacy status and motivation (answering RQ1; Table 3). As can be seen in Fig. 4c and d, a comparative analysis of the simple effects shows that the non-advocating animal ethics vegan was indeed perceived as significantly more moral (M = 5.64; SD = 0.92) and more committed (M = 5.92; SD = 0.73) than the non-advocating health vegan (morality: M = 5.13; SD = 0.86; commitment: M = 5.78; SD = 0.79), while differences in perceived morality and commitment were smaller and not significant if the advocating animal ethics vegan (morality: M = 5.29; SD = 0.97; commitment: M = 5.88; SD = 0.82) was compared to the advocating health vegan (morality: M = 5.19; SD = 0.88; commitment: M = 5.97; SD = 0.75). The advocating animal ethics vegan was perceived as less moral than the non-advocating animal ethics vegan but as equally committed (no significant difference), while the advocating health vegan was perceived as equally moral (no significant difference), but as significantly more committed compared to the non-advocating one. Although it seems that H4 was thus only supported in the health condition, an exploratory analysis below (§3.2.3.1) further qualifies the results for commitment.

Willingness to Change Diet. For willingness to change diet, we did not find a significant interaction, nor did we find a significant main effect for advocacy status or motivation on willingness to change diet (answering RQ2; Table 3). Omnivores were marginally less willing to change their diet when exposed to advocating vegans (M = 4.13; SD = 1.33) compared to non-advocating ones (M = 4.26; SD = 1.29), as

Table 3
Two-Way ANOVAs with Advocacy Status (advocacy: yes vs. no) and Motivation (health vs. animal ethics) as Predictors of Study 2 Outcome Variables. For each variable, Test Statistics for the Interaction effect, Main effects and Simple effects are reported, including p values and Effect sizes.

Effect Type	Interaction	Main effect		Simple effect			
	Advocacy * Motivation	Advocacy (Yes – No)	Motivation (Animal – Health)	Adv Health – No adv Health	Adv Animal – No adv Animal	No adv Animal – No adv Health	Adv Animal – Adv Health
Outcome	***F*(1, 1173), *p*, η_p^2**	***M*diff (*SE*), *p*, *d***	***M*diff (*SE*), *p*, *d***	***M*diff (*SE*), *p*, *d***	***M*diff (*SE*), *p*, *d***	***M*diff (*SE*), *p*, *d***	***M*diff (*SE*), *p*, *d***
Social attractiveness [a]	$F = 0.757$ $p = .384$ $\eta_p^2 = 0.001$ (H1)	**$M_{diff} = -0.34$ (0.07) $p < .001$, $d = 0.28$**	**$M_{diff} = -0.17$ (0.07) $p = .018$, $d = 0.14$**	**$M_{diff} = -0.28$ (0.10) $p = .004$, $d = 0.24$**	**$M_{diff} = -0.40$ (0.10) $p < .001$, $d = 0.32$**	$M_{diff} = -0.10$ (0.09) $p = .258$, $d = 0.09$	**$M_{diff} = -0.23$ (0.11) $p = .032$, $d = 0.18$**
Arrogant overcommitment	$F = 0.028$,$p = .867$ $\eta_p^2 = 0.000024$ (H2a)	**$M_{diff} = 0.37$ (0.07) $p < .001$, $d = 0.30$**	**$M_{diff} = 0.21$ (0.07) $p = .004$, $d = 0.16$**	**$M_{diff} = 0.38$ (0.10) $p < .001$, $d = 0.31$**	**$M_{diff} = 0.36$ (0.10) $p < .001$, $d = 0.29$**	**$M_{diff} = 0.22$ (0.10) $p = .032$, $d = 0.18$**	$M_{diff} = 0.19$ (0.10) $p = .060$, $d = 0.15$
Morality[a]	**$F = 15.83$ $p < .001$ $\eta_p^2 = 0.013$ (H3a)**	**$M_{diff} = -0.14$ (0.05) $p = .008$, $d = 0.15$**	**$M_{diff} = 0.31$ (0.05) $p < .001$, $d = 0.34$**	$M_{diff} = 0.07$ (0.07) $p = .354$, $d = 0.08$	**$M_{diff} = -0.35$ (0.08) $p < .001$, $d = 0.37$**	**$M_{diff} = 0.52$ (0.07) $p < .001$, $d = 0.58$**	$M_{diff} = 0.10$ (0.08) $p = .205$, $d = 0.10$
Commitment	**$F = 15.83$ $p < .001$ $\eta_p^2 = 0.006$ (RQ1)**	$M_{diff} = 0.08$ (0.05) $p = .078$, $d = 0.10$ (H4)	$M_{diff} = 0.03$ (0.05) $p = .494$, $d = 0.04$	**$M_{diff} = 0.19$ (0.06) $p = .002$, $d = 0.25$**	$M_{diff} = -0.04$ (0.06) $p = .570$, $d = 0.05$	**$M_{diff} = 0.15$ (0.06) $p = .021$, $d = 0.19$**	$M_{diff} = -0.09$ (0.06) $p = .186$, $d = 0.11$
Willingness to Change	$F = 0.002$ $p = .962$ $\eta_p^2 = 0.000002$ (RQ2)	$M_{diff} = -0.13$ (0.07) $p = .092$, $d = 0.10$	$M_{diff} = -0.01$ (0.07) $p = .917$, $d = 0.02$	$M_{diff} = -0.13$ (0.11) $p = .217$, $d = 0.10$	$M_{diff} = -0.13$ (0.11) $p = .250$, $d = 0.10$	$M_{diff} = -0.01$ (0.11) $p = .914$, $d = 0.01$	$M_{diff} = -0.004$ (0.11) $p = .969$, $d = 0.01$
Persuasiveness	$F = 0.475$ $p = .491$ $\eta_p^2 = 0.0004$	**$M_{diff} = -0.20$ (0.08) $p = .008$, $d = 0.15$**	**$M_{diff} = -0.27$ (0.08) $p < .001$, $d = 0.20$**	$M_{diff} = -0.15$ (0.11) $p = .165$, $d = 0.11$	**$M_{diff} = -0.26$ (0.11) $p = .020$, $d = 0.20$**	**$M_{diff} = 0.32$ (0.11) $p = .003$, $d = 0.25$**	**$M_{diff} = 0.22$ (0.11) $p = .049$, $d = 0.16$**
Sociability [a]	$F = 2.187$ $p = .140$ $\eta_p^2 = 0.002$	**$M_{diff} = -0.21$ (0.05) $p < .001$, $d = 0.25$**	$M_{diff} = -0.06$ (0.05) $p = .258$, $d = 0.06$	**$M_{diff} = -0.14$ (0.06) $p = .032$, $d = 0.18$**	**$M_{diff} = -0.29$ (0.07) $p < .001$, $d = 0.32$**	$M_{diff} = 0.02$ (0.06) $p = .791$, $d = 0.02$	$M_{diff} = -0.13$ (0.08) $p = .085$, $d = 0.14$
Eccentricity	$F = 0.006$ $p = .938$ $\eta_p^2 = 0.000005$	$M_{diff} = 0.06$ (0.07) $p = .377$, $d = 0.05$	$M_{diff} = 0.08$ (0.07) $p = .276$, $d = 0.06$	$M_{diff} = 0.05$ (0.10) $p = .566$, $d = 0.05$	$M_{diff} = 0.06$ (0.10) $p = .500$, $d = 0.06$	$M_{diff} = 0.07$ (0.09) $p = .471$, $d = 0.06$	$M_{diff} = 0.08$ (0.10) $p = .412$, $d = 0.07$
Healthiness	**$F = 5.251$ $p = .022$ $\eta_p^2 = 0.004$**	$M_{diff} = -0.04$ (0.06) $p = .460$, $d = 0.04$	**$M_{diff} = -0.28$ (0.06) $p < .001$, $d = 0.28$**	$M_{diff} = 0.09$ (0.08) $p = .270$, $d = 0.09$	**$M_{diff} = -0.18$ (0.08) $p = .033$, $d = 0.17$**	$M_{diff} = -0.15$ (0.08) $p = .076$, $d = 0.15$	**$M_{diff} = -0.42$ (0.08) $p < .001$, $d = 0.41$**

Note. Significant effects indicated in **bold**. Simple effects are more informative if there is a significant interaction. [a] Heteroscedasticity-consistent standard errors were used.

Fig. 4e shows, though on average they were rather neutral about changing their diet ($M = 4.19$) and there was considerable variation around the mean ($SD = 1.31$).

As in Study 1, participants were also more willing to *reduce* their consumption of animal products ($M = 4.81$, $SD = 1.41$) rather than radically change their diet ($M = 3.56$, $SD = 1.44$), but the ratings did not significantly differ across the four experimental conditions according to a repeated measures ANOVA with type of change (reducetarian versus radical) as within-subjects factor and our manipulations as between-subjects factors (for all tests of within-subject interactions: $p > .245$).

3.2.1.2. Exploratory variables. **Persuasiveness**. In contrast, for perceived persuasiveness we did find main effects of advocacy status and motivation (but no interaction effect, see Table 3). As Fig. 4f shows, the advocating vegans were perceived as less persuasive ($M = 5.08$; $SD = 1.36$) compared to the non-advocating vegans ($M = 5.28$; $SD = 1.31$), but vegans motivated by animal ethics were perceived as more persuasive ($M = 5.32$; $SD = 1.29$) compared to those motivated by health ($M = 5.04$; $SD = 1.37$).

Sociability and Eccentricity. For perceived sociability and eccentricity, we did not find significant interaction effects (Table 3), though we did find a main effect of advocacy status on sociability. Advocating vegans were seen as less sociable ($M = 5.06$; $SD = 1.90$) compared to non-advocating ones ($M = 4.27$; $SD = 1.79$), irrespective of their motivation. For eccentricity, there were no significant main effects of advocacy status or motivation.

Healthiness. For perceived healthiness, we also found a significant interaction effect (Table 3). As can be seen in Fig. 4i, the advocating health vegan ($M = 5.13$; $SD = 0.97$) was perceived as healthier than the advocating animal ethics vegan ($M = 4.72$; $SD = 1.05$), while differences in perceived healthiness for the non-advocating health vegan ($M = 5.04$; $SD = 1.01$) compared to the non-advocating animal ethics vegan ($M = 4.89$; $SD = 0.99$) were marginally significant. The advocating animal ethics vegan was also perceived as significantly less healthy compared to the non-advocating animal ethics vegan, while for the vegans motivated by health, there was no significant difference in perceived healthiness depending on their advocacy status.

Having described these interaction effects,[1] we now turn to the (moderated) mediation analyses that allow us to assess H2b (§3.2.2.1), H5 (§3.2.2.2), H3b and H3c (§3.2.2.3), respectively.

3.2.2. Mediation analyses

3.2.2.1. Step 1: manipulation exposure predicts social attractiveness via arrogant overcommitment. Because we found significant main effects of advocacy status and motivation for both social attractiveness and arrogant overcommitment, we used PROCESS model 4 to examine whether the negative effects of advocacy status, $d_{AS,\ total} = -0.34$, $SE = 0.07$, $t(1,174) = -4.80$, $p < .001$, and motivation, $d_{Mot,\ total} = -0.16$, $SE = 0.07$, $t(1,174) = -2.35$, $p = .019$, on social attractiveness were mediated by perceptions of arrogant overcommitment (thereby also testing H2b). The results of this dual predictor mediation model are shown in Fig. 5, which is the same mediation model as the one we preregistered (see p. 4 of our OSF-preregistration), except that we removed the hypothesized interactions between advocacy status and motivation on arrogant overcommitment and social attractiveness because our ANOVAs did not support these interactions.

[1] Because the effect of advocacy status and motivation on the outcome variables (social attractiveness, trait attributions, willingness to change and perceived persuasiveness) may depend on participants' demographic traits (e.g., gender), diet-related traits (e.g., carnism) and values (personal health, animal welfare), we also conducted a moderated moderation analysis for each outcome variable and participant characteristic separately. Significant results of this exploratory analysis are reported in the supplementary materials §2.4.

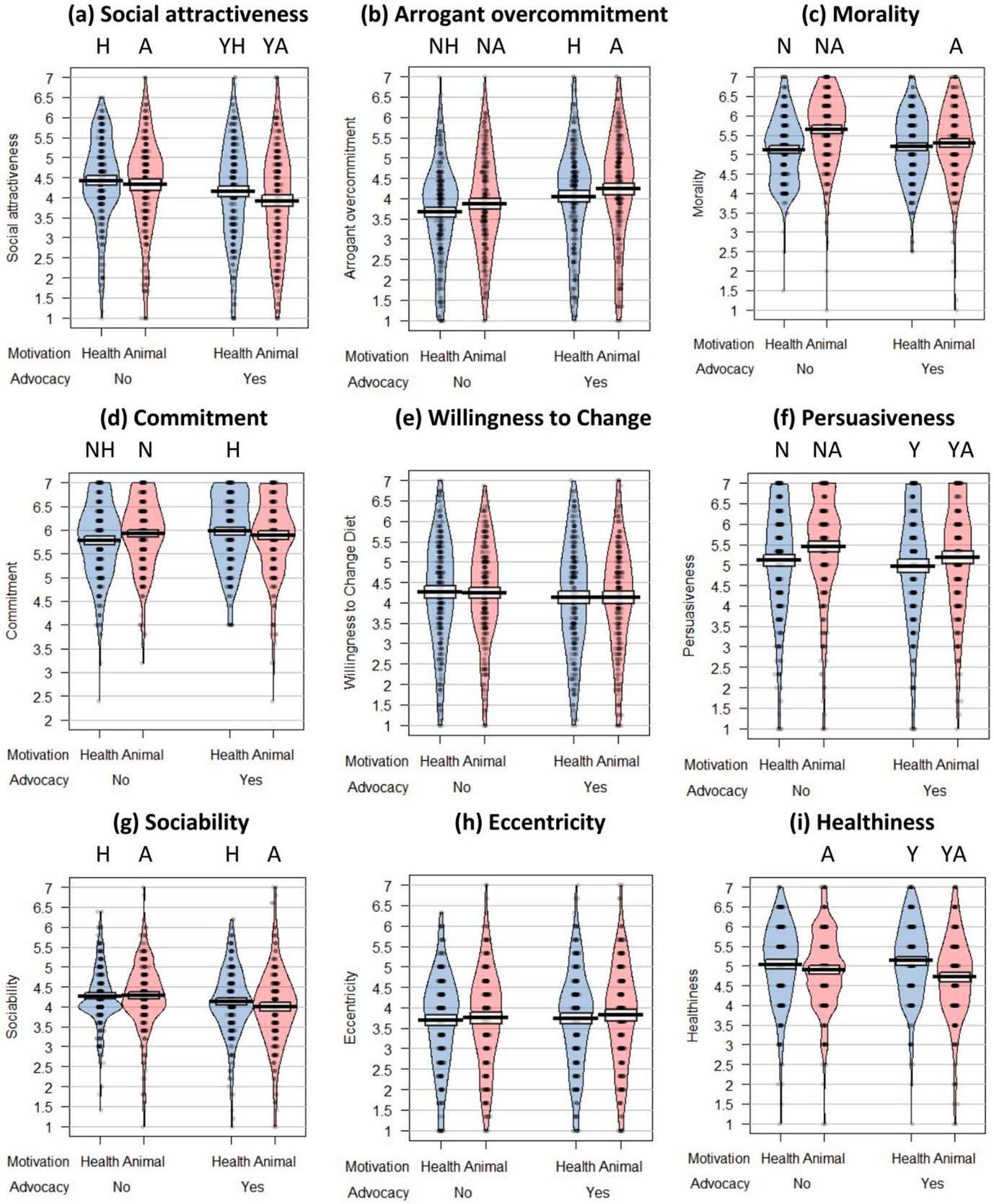

Fig. 4. *Bean plots for Study Variables Across Conditions*.
Note. For each subfigure, black dots represent raw data, horizontal bars represent means, white rectangles represent 95%-confidence intervals, and colored "beans" represent data densities. Means with the same letters (N, Y, H, A) differ significantly at $p < .05$. Only for (c) morality, (d) commitment, and (i) healthiness there was a significant interaction effect and simple effects were interpreted.

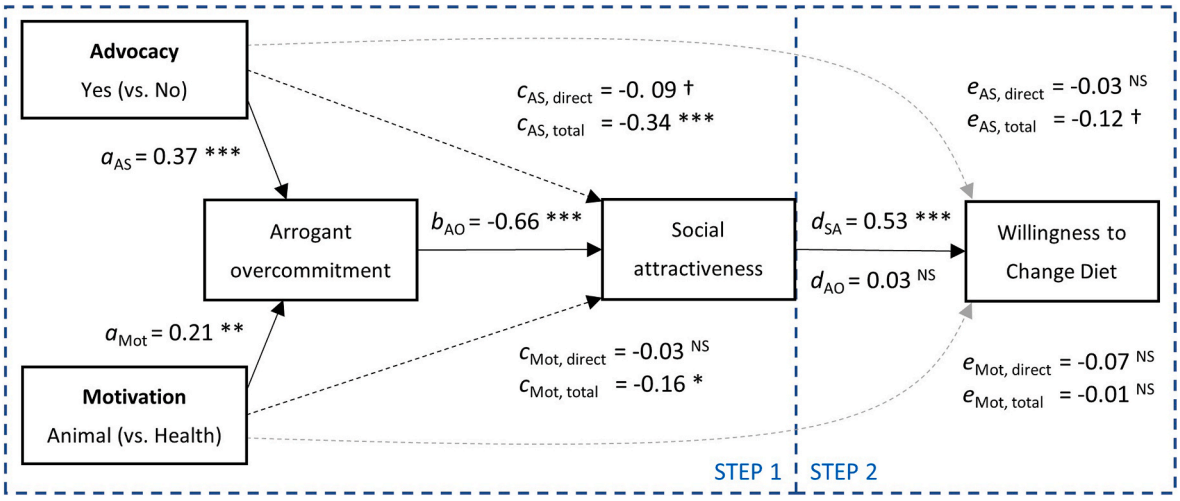

Fig. 5. *Results of Mediation Analyses Step 1 and Step 2 Note.* In Step 1, advocacy status and motivation were specified as predictors of social attractiveness via arrogant overcommitment. In Step 2, willingness to change diet was added as additional outcome variable downstream from social attractiveness. Unstandardized regression coefficients are noted, including total and direct effects of the experimental manipulations on social attractiveness (Step 1) and willingness to change diet (Step 2). ^{NS} $p \geq .10$, †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Consistent with the ANOVAs, higher perceptions of arrogant overcommitment were observed for both advocacy (vs. no advocacy), $a_{AS} = 0.37$, $SE = 0.07$, $t(1,174) = 5.15$, $p < .001$, and animal ethics (vs. health) motivation, $a_{Mot} = 0.21$, $SE = 0.07$, $t(1,174) = 2.85$, $p < .004$, and arrogant overcommitment in turn negatively predicted social attractiveness, $b_{AO} = -0.66$, $SE = 0.02$, $t(1,173) = -31.11$, $p < .001$, consistent with H2b. Perceptions of arrogant overcommitment fully mediated the negative effects of both advocacy (vs. no advocacy) and animal ethics (vs. health) motivation on social attractiveness, as the indirect effects of both advocacy (vs. no advocacy), $IE_{AS} = -0.25$, $BootSE = 0.05$, 95% BootCI [−0.34, −0.15], and animal ethics (vs. health) motivation, $IE_{Mot} = -0.14$, $SE = 0.05$, 95% BootCI [−0.23, −0.04], on social attractiveness via arrogant overcommitment were significant and the effects of advocacy (vs. no advocacy), $c_{AS,\ direct} = -0.09$, $SE = 0.05$, $t(1,173) = -1.73$, $p = .084$, and animal ethics (vs. health) motivation, $c_{Mot,\ direct} = -0.03$, $SE = 0.05$, $t(1,174) = -0.54$, $p = .587$, on social attractiveness were not significant anymore when controlling for arrogant overcommitment.

We performed the same robustness checks as in Study 1 on the indirect effects for both advocacy status and motivation (but with perceived persuasiveness instead of COVID-19-related anxiety), which indicated that the indirect effects were robust (not shown for brevity).

3.2.2.2. Step 2: effect on willingness to change diet. In order to test whether social attractiveness predicted participants' willingness to change their diet (H5), we added willingness to change diet as outcome variable downstream from social attractiveness. The results of this dual predictor serial mediation model, calculated using PROCESS model 6, are presented in Fig. 5 (Step 1 + 2). In line with H5, social attractiveness positively predicted participants' willingness to change diet, $d_{SA} = 0.53$, $SE = 0.04$, $t(1,172) = 12.74$, $p < .001$, while the effect of arrogant overcommitment on willingness to change diet, controlling for social attractiveness, was not significant, $d_{AO} = 0.03$, $SE = 0.04$, $t(1,172) = 0.76$, $p = .449$. Both advocacy (vs. no advocacy) and animal ethics (vs. health) motivation had an indirect effect on willingness to change via arrogant overcommitment and social attractiveness, $IE_{AS} = -0.13$, $BootSE = 0.03$, 95% BootCI [−0.19, −0.07] and $IE_{Mot} = -0.07$, $SE = 0.03$, 95% BootCI [−0.12, −0.02], respectively, while the indirect effects of the experimental manipulations on willingness to change diet via each mediator separately were not significant (i.e., there was only a serial mediation). However, advocacy (vs. no advocacy) and animal ethics (vs. health) motivation did not have a total effect on willingness to change diet, $e_{AS\ total} = -0.13$, $SE = 0.09$, $t(1,174) = -1.685$, $p = .092$, and $e_{Mot,\ total} = -0.01$, $SE = 0.08$, $t(1,174) = -0.105$, $p = .917$, or a direct effect on willingness to change diet, $e_{AS,\ direct} = 0.04$, $SE = 0.07$, $t(1,172) = 0.529$, $p = .597$, and $e_{Mot,\ direct} = 0.07$, $SE = 0.07$, $t(1,172) = 1.062$, $p = .288$, suggesting that other variables play a role in predicting willingness to change diet (counteracting the reported indirect effects).

3.2.2.3. Arrogant overcommitment downplays perceived morality. To test whether perceived arrogant overcommitment downplays the positive effect of morality on social attractiveness (thereby testing H3b and H3c), we used a serial mediation model with animal ethics (vs. health) motivation as predictor, social attractiveness as outcome, and perceived arrogant overcommitment and morality as first and second serial mediators, respectively. Because ANOVAs indicated that advocacy status only moderated the effect of motivation on morality, but not the effect of motivation on arrogant overcommitment and social attractiveness, we specified advocacy status only as a moderator of the first stage indirect effect of vegan motivation on morality. The results of this model are presented in Fig. 6.

Consistent with our theorizing, animal ethics (vs. health) motivation had two opposite indirect effects on social attractiveness. On the one hand, animal ethics (vs. health) motivation had a *positive* indirect effect on social attractiveness via perceived morality, and the strength of this indirect effect depended on advocacy status (index of moderated mediation: $IE = -0.14$, $BootSE = 0.03$, 95% BootCI [−0.22, −0.08]. Although both animal ethics (vs. health) vegans were perceived as more moral (when controlling for arrogant overcommitment), the difference in perceived morality was bigger for the non-advocating animal ethics (vs. health) vegan, $a_{\text{Mot (no)}} = 0.58$, $SE = 0.07$, $t(1,172) = 8.57$, $p < .001$, compared to the advocating animal ethics (vs. health) vegan, $a_{\text{Mot (yes)}} = 0.15$, $SE = 0.07$, $t(1,172) = 2.17$, $p = .030$ (test of highest order interaction: $R^2 = 0.013$, $F(1, 1172) = 19.19$, $p < .001$) and, in line with H3b, perceived morality had a positive effect on social attractiveness, $b_{\text{Mor}} = 0.33$, $SE = 0.03$, $t(1,173) = 1.062$, $p < .001$. As a result, there was a significant indirect effect of animal ethics (vs. health) motivation on social attractiveness via perceived morality when advocacy was present, $IE = 0.05$, $BootSE = 0.02$, 95% BootCI [0.004, 0.10], but especially when there was no advocacy, $IE = 0.19$, $BootSE = 0.02$, 95% BootCI [0.14, 0.25].

On the other hand, animal ethics (vs. health) motivation also had a *negative* indirect effect on social attractiveness because of increased perceptions of arrogant overcommitment, $a_{\text{Mot}} = 0.21$, $SE = 0.07$, t

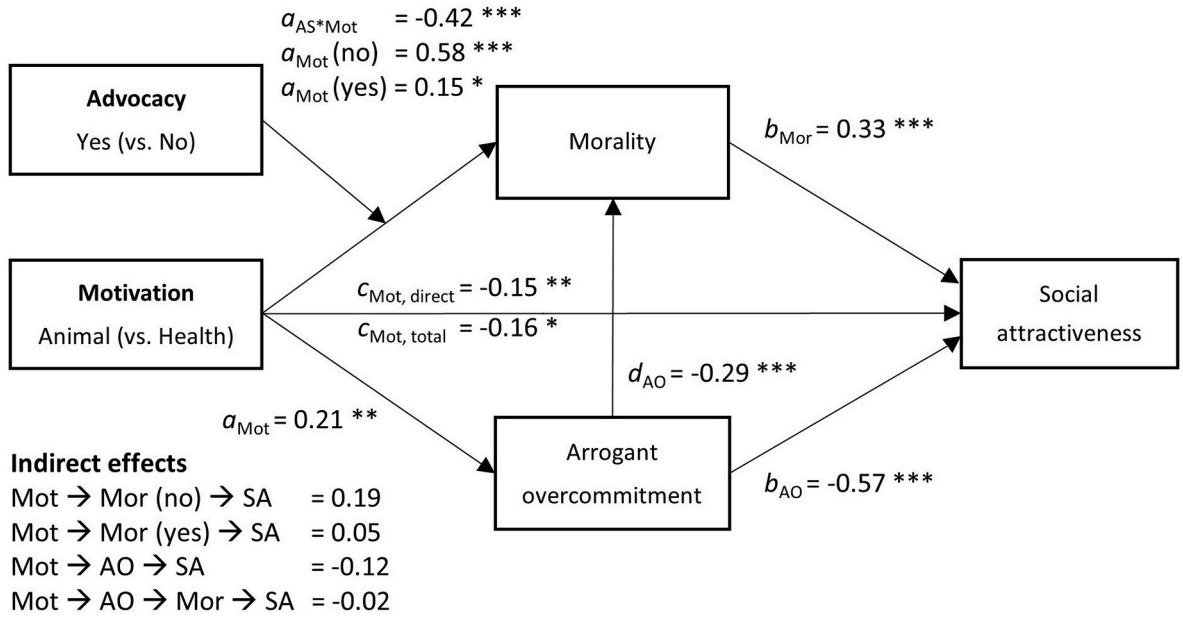

Fig. 6. *Effects of Animal Ethics (vs. Health) Motivation (Mot) on Social Attractiveness (SA) with Arrogant Overcommitment (AO) and Morality (Mor) as Serial Mediators and Morality Moderated by Advocacy Status (AS) Note.* All indirect effects were significant as the bootstrap intervals did not contain zero (see text). Similar opposing effects of morality and arrogant overcommitment were found for willingness to change diet and perceived persuasiveness as outcome variables (see §2.5 and Table S6 in supplementary materials). *$p < .05$, **$p < .01$, ***$p < .001$.

(1,175) = 2.82, $p = .005$, which negatively predicted social attractiveness, in part because perceptions of arrogant overcommitment had a negative effect on perceived morality, $d_{AO} = -0.29$, $SE = 0.02$, $t(1,173) = -11.92$, $p < .001$, in line with H3c, but more so because of its direct, negative effect on social attractiveness when controlling for perceived morality, $b_{AO} = -0.56$, $SE = 0.02$, $t(1,173) = -26.34$, $p < .001$. As a result, animal ethics (vs. health) motivation had a negative effect on social attractiveness indirectly via perceptions of arrogant overcommitment, $IE = -0.12$, $BootSE = 0.04$, 95% BootCI [−0.20, −0.04] and to a lesser extent because perceived arrogant overcommitment also downplays the effect of perceived morality, $IE = -0.02$, $BootSE = 0.01$, 95% BootCI [−0.04, −0.01].

Notably, the direct effect of animal ethics (vs. health) motivation on social attractiveness was more negative and significant again (compared to the mediation model in Step 1) when controlling for the effect of perceived morality, $c_{Mot, direct} = -0.15$, $SE = 0.05$, $t(1,173) = -2.91$, $p = .004$ (see Fig. 6). This effect became smaller and insignificant again when perceived healthiness was added as covariate in predicting the effect of motivation on social attractiveness, $c_{Mot, direct} = -0.09$, $SE = 0.05$, $t(1,173) = -1.69$, $p = .092$.

Having described the results of our main analysis, we will now turn to the results of two final exploratory analyses to further qualify our findings.

3.2.3. Exploratory analyses

3.2.3.1. Commitment. Exploratory analyses were performed to gain insight in the results for perceived commitment, and indicated that (a) a higher perceived morality fully mediated the higher perceived commitment of the non-advocating animal ethics (vs. health) vegan, that (b) the lower perceived commitment of the advocating animal ethics (vs. health) vegan could be explained by the lower perceived morality, that (c) advocacy had a positive effect on commitment when controlling for morality (in line with H4), that (d) animal ethics (vs. health) vegans were seen as slightly *less* committed when controlling for advocacy status and perceived morality, and that (e) perceived healthiness positively predicted perceived commitment. See supplementary materials §2.6 for more details on these analyses.

3.2.3.2. Moderated mediation analysis: omnivore identification, carnism, and gender. Lastly, an exploratory moderated mediation analysis revealed that omnivore identification negatively predicted social attractiveness and this effect was partially mediated by both carnist beliefs and perceptions of arrogant overcommitment as serial mediators. In addition, this indirect effect was stronger when omnivores were exposed to animal ethics (vs. health) vegans, irrespective of their advocacy status. Because men (vs. women) identify more strongly as omnivores (see Table S5), we performed the same analysis with gender entered as the predictor instead of omnivore identification. The findings were similar: male (vs. female) gender negatively predicted social attractiveness, yet this effect was *fully* mediated by carnism and arrogant overcommitment. Again, this indirect effect was stronger when males were exposed to animal ethics (vs. health) vegans (for details, see §2.7 and Table S7 in the supplementary materials).[2]

4. General discussion

In the present studies, we tested the possibility that vegan advocacy focused on animal ethics (vs. health) acts as a double-edged sword: We expected that omnivores would view animal ethics vegans as more moral and committed, but also as more moralistic (arrogant and overcommitted) – which would predict a lower social attractiveness of vegans and a lower willingness to adopt a more vegan diet. In general, the findings of Study 2 were in line with this initial theorizing, but we found that advocacy attenuates relative morality and commitment perceptions. In line with expectations based on Study 1, we also found that animal ethics and health vegan advocates did not differ in terms of perceived commitment nor did they elicit in participants a different willingness to change diet. In the following sections, we first discuss the effects of our manipulations on arrogant overcommitment and social attractiveness, then the role of perceived morality and commitment, and

[2] We also redid the mediation analyses covered in section §3.2.2 (Figs. 5 and 6) with gender added as a moderator. Because the few gender differences we found were small, we only briefly report the results in the supplementary materials (§2.8).

finally the role of willingness to change diet, carnism, gender, and perceived persuasiveness.

4.1. Arrogant overcommitment and social attractiveness

In contrast with our hypotheses formulated in Study 2, advocacy did not attenuate perceived differences in arrogant overcommitment and social attractiveness; the effects of advocacy and vegan motivation instead seemed to be independent and additive. Omnivores rated advocating vegans as significantly more arrogantly overcommitted than non-advocating vegans, which could explain a lower social attraction toward them. Similarly, advocating vegans were seen as less sociable and less persuasive. Irrespective of the advocacy status of vegans, we also found that omnivores viewed animal ethics (vs. health) vegans as more arrogantly overcommitted, and consequently, as less socially attractive, consistent with a recent study (Weiper & Vonk, 2021).

Because the design and samples of both our studies were very similar, the different results for the advocacy condition are likely due to differences in our experimental manipulations. The design of Study 2, however, does not allow us to provide a clear causal explanation, as we cannot disentangle whether the different results are due to an avoidance of "animal" cues that arguably made the stimuli for the animal ethics versus health vegan advocates more distinguishable and/or due to the fact that we manipulated advocacy status more strongly (e.g., identity-first language, amplifying language such as "publicly supports"). It is possible that these stronger manipulations of advocacy increased participants' self-involvement and feelings of threat relatively more in omnivores exposed to the (now more distinct) animal ethics (vs. health) vegan advocates (Bolderdijk et al., 2018). We also used the terms "vegan diet" and "plant-based diet" interchangeably, but a plant-based diet may or may not include animal products (Corrin & Papadopoulos, 2017). Although it might have been clear from the context that the plant-based diet referred to a vegan diet, different connotations may exert different effects. Besides the potential effects exerted by the variables in our design, researchers have identified a long list of moderators of the outgroup homogeneity effect (Rubin & Badea, 2007). Future research could thus focus more on moderating factors.

4.2. Morality and commitment

With regard to perceived morality, our hypothesized interaction in Study 2 was supported: Animal ethics (vs. health) vegans were seen as more moral, but the difference in perceived morality was smaller when the vegans were described as actively advocating. As a result, the positive indirect effect of motivation on social attractiveness via perceived morality was weaker in the advocacy (vs. non-advocacy) condition. Furthermore, we found that the positive effect of animal ethics (vs. health) motivation on social attractiveness via perceived morality was counteracted by a negative effect of perceived arrogant overcommitment on both morality and social attractiveness, reflecting do-gooder derogation (Minson & Monin, 2012).

The finding that the advocating animal ethics vegan was perceived as less moral than the non-advocating one (while no difference was found for the health vegan), resembles a common theme within minority influence research: Agreement with minorities is most marked at a private level while resistance to minorities is typical in public settings because people experience normative pressures to avoid appearing deviant and to comply with the majority position (Moscovici, 1985; Mugny & Pérez, 1991; Wood et al., 1994). Animal ethics motivations are stigmatized (Greenebaum, 2012), and expressing agreement with a vegan who publicly promotes them (as reflected by morality ratings) would appear self-contradicting for omnivores, while health motivations for veganism are more mainstream and do not radically undermine omnivore practices. A pattern of private acceptance and public disagreement with animal ethics motivations might also explain why omnivores generally perceived the animal ethics vegan as equally healthy as the health vegan in the ("private") non-advocacy condition, but as less healthy in the ("public") advocacy condition, while the neutrality of health motivations pro veganism may explain why advocating and non-advocating health vegans were perceived as equally healthy. By signaling conflicting interests as outgroups (Brewer, 1999), omnivorous may also view vegan and animal ethics advocates more suspiciously as having a self-serving agenda (Parkinson et al., 2019) or threatening cherished traditions (Dhont & Hodson, 2014), thus reducing moral impressions.

Concerning commitment, we found that the non-advocating animal ethics (vs. health) vegan was perceived as more committed, which could be explained by their higher perceived morality. The fact that the advocating animal ethics vegan was perceived as less moral than the non-advocating one could also explain why the advocating animal ethics vegan was not perceived as more committed, despite engaging in advocacy. Surprisingly, when we controlled for morality, omnivores viewed health (vs. animal ethics) vegans as *more* committed irrespective of their advocacy status, perhaps because it may appear more difficult to commit to veganism for (less persuasive) health reasons. Overall, our article suggests that commitment perceptions might be affected by a variety of factors including dietary adherence (high commitment), advocacy (higher commitment), perceived morality and perceived healthiness (higher commitment).

4.3. Willingness to change diet, carnism, gender, and perceived persuasiveness

Concerning willingness to change diet, our results suggest that animal ethics (vs. health) vegans and advocating (vs. non-advocating) vegans induce a *lower* willingness to change diet via perceptions of arrogant overcommitment and social attractiveness. At the same time, an exposure to animal ethics (vs. health) vegans is also indirectly associated with a *higher* willingness to change via perceived morality, especially in the non-advocacy condition. Consistent with minority influence research (Wood et al., 1994), we also found that omnivores were more likely to show a willingness to change on the measure not directly related to the minority identity; they were open for reducetarian changes, but not radical changes to their diet. However, the ratings for the willingness to change (sub)scales did not significantly differ across conditions, corroborating minority influence studies showing that the influence minorities exert on majority members is usually non-existent at a manifest level (Moscovici, 1985; Mugny & Pérez, 1991; Wood et al., 1994). In the case of veganism, eating meat and other animal products is embedded in deeply rooted habits (Bastian & Loughnan, 2017; Graça et al., 2015) and supported by the carnist majority ideology (Joy, 2009; Monteiro et al., 2017), with which a willingness to change diet is strongly inversely correlated.

Concerning the role of carnism, our exploratory analyses showed that carnism endorsement was positively predicted by meat consumption frequency (Study 1), being non-flexitarian (Study 1) and strength of identification as an omnivore (Study 2). Carnism endorsement itself predicted a lower social attractiveness of vegans, partially via arrogant overcommitment perceptions. In addition, participants who endorsed carnism more strongly were more likely to derogate animal ethics (vs. health) vegans as arrogantly overcommitted and socially unattractive. These analyses corroborate Joy's (2018) theorizing that primary carnist defenses which validate the consumption of animals are interrelated with "secondary" defenses that invalidate vegan ideology and practice.

Men (vs. women) also endorsed carnism more strongly and had more negative attitudes toward vegans; animal ethics (vs. health) vegans in particular. Although gender differences in our exploratory analyses were not highly pronounced, our findings are consistent with research showing that (traditional) notions of masculinity conflict with veganism in general (Thomas, 2016; Vartanian, 2015), but also with animal rights motives and – to a lesser extent – health motives in specific (Hopwood et al., 2020; Rothgerber, 2013). Future research could include the role of perceived masculinity threat as an explanatory variable for gender

differences.

Despite the findings covered above, we also found that omnivores in general strongly endorsed animal-welfare values, that carnism endorsement was fairly low, and that animal ethics motivations were generally considered persuasive, and more so than health motivations. Although previous research (Parkinson et al., 2019) reported that omnivores attribute higher credibility to pro-vegan health (vs. animal ethics) messages, this contradicting finding can be explained by a pattern of private acceptance versus public disagreement (i.e., pluralistic ignorance) with animal ethics motivations. The study of Parkinson et al. (2019) was carried out in a public setting (i.e., focus groups), which might prompt omnivores to engage in normative reasoning and advertise health (vs. animal ethics) motives pro veganism as more persuasive to enable consensus and eliminate deviance, while in a (more) private setting (e.g., our questionnaire) omnivores may indicate that they find animal ethics arguments more persuasive based on the informational content.

Having discussed our main findings, we will now turn to the limitations of our study, which may inspire future research, and conclude with practical and theoretical implications.

4.4. Limitations and future research

First, researchers may question the ecological validity of the vignette method because reading about a vegan is very different from being exposed to an actual vegan. Future research may thus rely on more practically relevant stimuli (e.g., video fragments of vegan advocates). Future research could also manipulate animal ethics or health motivations differently (De Groeve & Rosenfeld, 2022) or use stimuli of vegans with other motivations (e.g., the environment, social justice, religion) (MacInnis & Hodson, 2021); other calls for change (e.g., reducetarianism) or different source attributes (De Groeve & Rosenfeld, 2022; Weiper & Vonk, 2021), such as gender. Concerning gender, our choice for a female vegan ("Jane") is consistent with the fact that women are more often vegan (Ruby, 2012) and engage in lifestyle choice activism on behalf of animals (Costa et al., 2019), yet future studies with more sophisticated experimental designs could examine gender matching versus mismatching effects in perceptions of vegans (Phua et al., 2019).

Secondly, for some variables we used scales that were not rigorously validated, yet all our initial scales were grounded by theory and their use was substantiated by empirical evidence (e.g., factor analysis, reliability measures). Concerning arrogant overcommitment, we did not anticipate that the arrogance and overcommitment traits would be inseparable in factor analysis. One explanation is that moralistic stereotypes capture both arrogance and overcommitment simultaneously (e.g., preachy, judgmental) and was therefore an underlying factor in omnivores' trait judgments. Future research should assess the validity of the construct more rigorously. Concerning our morality scale, we used traits that are directly relevant to having helpful intentions, but the scale did not include traits related to truthfulness (e.g., trustworthy, honest) or justice (e.g., fair), which are generally considered highly relevant to morality in stereotype content research (Brambilla & Leach, 2014; Goodwin et al., 2014). As a result, our findings are not generalizable to all morality traits and future research may include these traits.

Thirdly, we also acknowledge that, apart from the causal relations imposed by our experimental manipulations, our cross-sectional data and statistical analyses on themselves do not allow us to infer the causal relations we deduced theoretically. Additional research is needed to empirically demonstrate theorized mechanism(s) underlying omnivores' impressions of animal ethics and health vegans. Although we found that diet-related variables and carnism endorsement were associated with attributions of arrogant overcommitment, future studies could also consider the role of moral identity, anticipated moral reproach, and feelings of self-involvement or threat. In addition, future research on right-wing ideology and moralistic stereotyping seems promising. Measures of right-wing ideologies have been shown to predict negative attitudes toward animals and vegans (Dhont & Hodson, 2014; Judge & Wilson, 2019; MacInnis & Hodson, 2017) and are associated with omnivore identification, traditional masculinity (Allen et al., 2000), and carnism (Dhont & Hodson, 2014; Monteiro et al., 2017).

Lastly, despite potential concerns about generality, we found that our findings were mostly robust against our demographic variables and COVID-related anxiety (Study 1). Other important strengths of our study include its reliance on preregistration, its theoretical grounding, and the use of factor and power analysis to ensure proper measurement.

4.5. Practical implications, theoretical implications and conclusion

Practically, our findings inform recurring debates within the vegan movement on how to effectively persuade others (Greenebaum, 2015; Leenaert, 2020). We provide experimental evidence for what vegans already experience (Greenebaum, 2012): To remain socially attractive to omnivores, it is better for vegans to remain silent about their identity, and if they do advocate for plant-based dieting, health (vs. animal ethics) motivations will evoke less rejection. On the other hand, we provide clear evidence that an animal ethics vegan is seen as more persuasive and as distinctively more morally committed when *not* advocating. Omnivores show a pattern of private acceptance and public disagreement in this regard; raising awareness about it might help to break pluralistic ignorance among omnivores. Overall, women and people with weaker carnist identities (e.g., flexitarian, low omnivore identification) are more likely to respond favorably to vegan advocacy, while men are more likely to derogate (animal ethics) vegans. Although animal ethics advocacy may evoke the most direct resistance, its indirect, long-term effects remain to be explored (De Groeve & Rosenfeld, 2022; Mathur et al., 2021).

Theoretically, we provide empirical support for the central premise within vegan paradox theorizing that the meat paradox and the vegan paradox are interrelated. Just like there is an ambiguity in caring for animals and eating animal products, animal ethics vegans may simultaneously have a moral ring to them and a moralistic sting; an ambiguity less pronounced in health vegans. We extend this theorizing by highlighting the attenuating role of advocacy on perceptions of moral commitment. We also contribute to the psychology of do-gooder derogation (Minson & Monin, 2012) and corroborate Joy's (2018) theorizing that the derogation of vegans is a manifestation of carnism. Although omnivores' dietary orientation seems largely pre-established, our research provides a first step to revive the topic of minority influence within research on the promotion of plant-based diets by examining the underexplored topic of vegan advocacy (De Groeve & Rosenfeld, 2022).

Open practices

Preregistered materials, data, and analysis scripts are available via https://osf.io/v8a63/.

Author contributions

All authors contributed to the design of the study. The first author performed the experiment, analyzed the data, and wrote the manuscript with the second, third and last author providing edits, guidance and suggestions. All authors have read and approved the final article.

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Ethical approval

The studies are part of a project for which ethical approval was obtained from the Ethical Committee of the Faculty of Political and Social Sciences at Ghent University (Belgium). Participants were guaranteed anonymity and were informed that the questionnaires were entirely voluntary: Participants could withdraw their participation at any time.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2022.106006.

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