



Why some choose the vegetarian option: Are all ethical motivations the same?

Daniel L. Rosenfeld¹

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Abstract

Many studies have demonstrated psychological differences between ethically motivated and health-motivated vegetarians. Adopting an ethical-health dichotomy in studying dietary motivation, however, may overlook meaningful variance between vegetarians motivated by different types of ethical concerns—namely, those related to animals and the environment. Through two preregistered studies, I compared dietary goal orientations, disgust toward meat, and dietary adherence between vegetarians motivated by animals, health, and the environment. In Study 1 ($N=361$), I found that environmentally motivated vegetarians resembled animal-motivated vegetarians in construing their diets as a means of achieving more prosocial and moral, but less personal, goals than did health-motivated vegetarians. In Study 2 ($N=562$), however, I found that environmentally motivated vegetarians resembled health-motivated vegetarians in reporting less disgust toward meat and lower dietary adherence than did animal-motivated vegetarians. Stronger feelings of disgust toward meat explained why animal-motivated vegetarians exhibited the most stringent dietary adherence. Distinguishing between various types of ethical motivation may reveal more nuanced insights into eating behavior.

Keywords Vegetarian · Motivation · Disgust · Food choice

In social scientific explorations of vegetarianism, dietary motivation has often been at center stage (Rosenfeld and Burrow 2017b; Rothgerber 2017; Ruby 2012). Many studies have found that whether people follow a vegetarian diet for ethical or health reasons predicts notable facets of their attitudes, self-perceptions, and behaviors (e.g., Fox and Ward 2008; Hoffman et al. 2013, Jabs et al. 1998; Radnitz et al. 2015; Rothgerber 2014a, b). Categorizing vegetarian motivations dichotomously as pertaining to either ethics or health, however, may conflate different types of ethical motivation within one overly reductionist construct (Janssen et al. 2016; Rosenfeld and Burrow 2017a, b; Stiles 1998). Namely, might concerns about the effects of meat consumption on animals and the environment constitute two distinct ethical motivations that divergently shape how vegetarians construe and maintain their diets?

The motivations people have for consuming a vegetarian diet shape how they perceive not only their food choices

but also their dietary group membership and its ideological significance (Fox and Ward 2008; Greenebaum 2012; Stiles 1998). Accordingly, it is unsurprising that ethically motivated and health-motivated vegetarians report having converted to vegetarianism through different processes and employ different rhetorical strategies when explaining their food choices to others (Jabs et al. 1998; Wilson et al. 2004). Moreover, compared to health-motivated vegetarians, ethically motivated vegetarians hold stronger attitudes toward animal rights, attribute greater mind to animals, feel greater disgust toward meat, and set higher standards of dietary adherence for themselves (Jabs et al. 1998; Janssen et al. 2016; Rothgerber 2013, 2014a; Rozin et al. 1997). Motivation also may predict the maintenance of vegetarianism over time, as people who initially became vegetarian for ethical reasons report having followed their diets for a longer duration than do those who became vegetarian for health reasons (Hoffman et al. 2013).

The ambiguous scope of ethical motivation, however, limits the generalizability of these and other findings. A more rigorous understanding of the psychological correlates of vegetarian motivation is needed for investigators to advance theory-driven research on this eating behavior, for

✉ Daniel L. Rosenfeld
rosenfeld@g.ucla.edu

¹ University of California, Los Angeles, Los Angeles, CA, USA

health practitioners to understand their vegetarian clients better, and for individuals to understand how to maintain a vegetarian diet most effectively. Social psychological theories of morality, cognitive dissonance, and identity play a central role in research on vegetarianism (Rosenfeld 2018). However, the empirical tests that investigators derive from these theories may encounter undue variance when considering animal, environmental, and other ethical concerns within a single motivational construct. Moreover, given that high proportions of vegetarians actually eat meat on occasion (Rothgerber 2017) or ultimately decide to give up vegetarianism altogether (Herzog 2014), identifying the processes surrounding specific types of ethical motivation and dietary adherence can provide critical insights into research on, and practical recommendations for, behavioral change.

In reviewing conceptual frameworks for studying vegetarian motivations, Rosenfeld and Burrow (2017b) highlight that the preponderance of existing research comparing vegetarians with different motivations has categorized individuals as either ethically motivated or health-motivated, with much less research categorizing those reporting ethical concerns by their specific types of ethical motivation. Yet focusing on people's specific motivations can reflect more concretely what people think about when deciding which animal products to consume—that is, what comes to mind when they envision the consequences of consuming a food they deem off limits? Whereas some studies (e.g., Fox and Ward 2008; Janssen et al. 2016; Radnitz et al. 2015) have conceived ethical motivation as synonymous with concerns about animals, other studies (e.g., Haverstock and Forgyas 2012; Hoffman et al. 2013) have considered additional concerns beyond animal concerns—such as those related to religion, the environment, or politics—to be types of ethical motivation. This latter method may produce ambiguity, as Stiles (1998) notes that, “While moral concerns may be embedded within either animal rights, ethics, environmental concerns, or religious motives, and, thus, cause some overlap, simply placing these concerns into a broad ‘moral’ category provides little in delineating what differences are involved and more precise meanings attached to each category” (p. 217). The current research aimed to address this knowledge gap.

Through two studies, I sought to categorize vegetarians by their specific motivations regarding animals, health, and the environment, as recent studies suggest that these constitute the three most common motivations of vegetarians in Western cultures (Dyett et al. 2013; Fox and Ward 2008; Hoffman et al. 2013; Izmirli and Phillips 2011; Janssen et al. 2016; Radnitz et al. 2015; Ruby 2012; Timko et al. 2012). In Study 1, I investigated the extents to which vegetarians with animal, health, and environmental motivations differ in their prosocial, personal, and moral dietary goal orientations. In Study 2, I examined the link

between dietary motivation and dietary adherence, testing disgust toward meat as a potential mediator of this link. Across these two studies, I predicted that whereas both animal-motivated and environmentally motivated vegetarians would exhibit a stronger moral goal orientation than would health-motivated vegetarians, this increased moralization would promote particularly strong disgust toward meat and dietary adherence for animal-motivated vegetarians—that is, I predicted that animal-motivated vegetarians would be more disgusted by meat and adhere to their diets more strictly than would either health-motivated or environmentally motivated vegetarians.

Prosocial, personal, and moral goal orientations

Ultimately, vegetarian motivation characterizes why people follow a meatless dietary pattern—what goals they aim to attain by eating this way. Rooted in the Unified Model of Vegetarian Identity (Rosenfeld and Burrow 2017a), Rosenfeld and Burrow's (2018) dietarian identity framework posits that, when it comes to eschewing animal products, people construe their dietary patterns as a means of achieving prosocial, personal, and moral goals to varying extents. Whereas prosocial goals embody aims of following one's dietary pattern in order to benefit something beyond oneself, personal goals constitute one's aims to improve oneself in some way. Moral goals refer to the extent to which one's perceptions of right and wrong underlie one's decision to follow one's dietary pattern.

Reviewing qualitative investigations into vegetarian motivation (e.g., Fox and Ward 2008; Greenebaum 2012), Rosenfeld and Burrow (2017a, b) have posited that animal-motivated and environmentally motivated vegetarians are likely to construe their food choices as prosocial, whereas health-motivated vegetarians are likely to draw upon a personal aim. Concerns about animals and the environment extend one's focus beyond one's self, whereas a concern about health is rooted in securing one's own well-being. Yet goal orientations are mutually inclusive, such that concerns about morality may be intertwined with both prosocial and personal aims (Rosenfeld and Burrow 2017a, b). Prior research that has categorized vegetarians as either ethically or health-motivated has left two matters ambiguous: first, whether animal-motivated and environmentally motivated vegetarians moralize their diets to varying extents and second, whether health-motivated vegetarians moralize their diets to any meaningful extent at all. As such, the current study is needed to clarify how people construe specific animal, health, and environmental motivations as related to these three goal orientations.

Vegetarian motivation and dietary adherence

In addition to goal orientations, a second outcome that can elucidate a potential contrast between animal-motivated and environmentally motivated vegetarians is dietary adherence. Imagine a vegetarian at a colleague's dinner party. After bearing through a cocktail hour with no meatless options, the vegetarian is relieved to hear the host invite guests to take a seat for the main course. It seems like all day since she'd eaten lunch! But the evening's main course options—bean chili and chicken scampi—leave her with a tough choice. She has a strong disdain for beans, on the one hand, but would like to follow her vegetarian diet, on the other. In such a scenario, will she accept a dietary violation and order the chicken dish or will she adhere to her diet and tolerate beans for the evening?

This vegetarian is grappling with a consideration of dietary strictness, or the extent to which she adheres to her dietary pattern (Rosenfeld and Burrow 2017a). Many studies have highlighted that vegetarians exhibit varying levels of strictness, recurrently documenting the seemingly contradictory finding that some people who self-identify as vegetarian report that they eat meat from time to time (Dietz et al. 1995; Rothgerber 2014a; Ruby 2012; White et al. 1999; Willetts 1997). Why do some vegetarians exercise a high level of strictness while others are more flexible with their adherence? Evidence exists to suggest that the motivations one has for being a vegetarian may influence one's willingness to eat meat and one's reactivity to dietary breaches.

Central to vegetarianism is the aim to refrain from consuming meat, and ethical motivation—but not health motivation—is associated with successfully excluding a food group from one's diet (Ogden et al. 2006). Having an ethical aim thus might promote greater dietary adherence, as Rozin et al. (1997) found that morally motivated, but not health-motivated, vegetarians construe meat avoidance as an "ought"—that is, a moral obligation. Likewise, Hamilton (2006) suggests that vegetarians with an ethical stance behind their dietary patterns are more likely than are health-motivated vegetarians to exercise a greater dietary strictness.

In some circumstances, it may be difficult to follow one's dietary pattern due to social pressures or a lack of food options (Jabs et al. 2000). Jabs and colleagues (2000) suggest that, in such cases, health-motivated vegetarians would be more likely to violate their dietary pattern in order to avoid straining a social interaction than would ethically motivated vegetarians. Supporting this notion, more recently, Rothgerber (2014a) found that vegetarians who would refuse to eat any type of meat were more

likely to be ethically motivated than were vegetarians who would reluctantly or readily consume meat. This pattern may tie directly into one's perceptions of animal rights. In a sample of vegetarians and conscientious omnivores, Rothgerber (2015) found that stronger animal rights attitude was associated with fewer dietary violations and a greater belief that following one's dietary pattern without exception is absolutely necessary. As such, several sources of evidence suggest that ethically motivated vegetarians exhibit a higher dietary strictness than do health-motivated vegetarians. However, not all forms of ethical motivation may operate similarly: concerns about animals and the environment likely promote dietary strictness to varying extents.

Variations in the extents to which ethically motivated and health-motivated vegetarians feel disgusted by meat may explain differences in their levels of dietary strictness. As an emotion central to processes of intuitive moral judgment (Inbar et al. 2009) and food choice (Egolf et al. 2018; Rozin and Fallon 1987), disgust constitutes an aversion that often underlies people's decisions to eschew animal products (Rosenfeld and Burrow 2017b). Many studies suggest that ethically motivated vegetarians are more disgusted by meat than are health-motivated vegetarians (Arora et al. 2017, Jabs et al. 1998; Rothgerber 2014a, 2015; Rozin et al. 1997). Notably, ethically motivated vegetarians' greater level of disgust sensitivity toward meat is a result, rather than a cause, of their moral convictions (Fessler et al. 2003). Still unclear, however, is the extent to which meat disgust differs between animal-motivated, health-motivated, and environmentally motivated vegetarians. Given that associating meat with its animal origins can promote greater disgust toward meat (Kunst and Haugestad 2018; Kunst and Hohle 2016; Ruby and Heine 2012), I reasoned that animal-motivated vegetarians would report greater disgust toward meat than would vegetarians with either health or environmental motivations. This heightened level of disgust may lead animal-motivated vegetarians to follow their diets particularly strictly, as people seek to eschew foods they view as disgusting in order to avoid ingesting contaminants (Rozin and Fallon 1987).

As reviewed earlier, many vegetarians report that they eat meat occasionally, which raises an interesting question: How do vegetarians feel about their dietary violations? Dietary strictness indicates a standard to which one holds oneself but fails to explain how much negative affect would result from violating that standard. While I reasoned that feelings of disgust toward meat would promote both greater dietary strictness and greater emotional upset at the thought of eating meat, I considered the possibility that disgust-strictness and disgust-upset links might diverge depending on a vegetarian's motivation. For example, meat disgust among animal-motivated vegetarians may originate from animal-meat association and relate to the avoidance of disease brought on by oral ingestion

of contaminants (Rozin and Fallon 1987). Meat disgust among environmentally motivated vegetarians, meanwhile, may be more related to social disgust (e.g., Haidt 2000), constituting a moral disdain for normative environmental degradation due to meat production and consumption. Thus, for environmentally motivated vegetarians, the same levels of reported meat disgust might not induce the same sensory-affective responses as they would for animal-motivated vegetarians. Although disgust should predict affective and behavioral facets of dietary adherence among both animal-motivated and environmentally motivated vegetarians, I nevertheless aimed to examine both dietary strictness and imagined emotional upset from eating meat in order to test for such a possible divergence in behavioral and affective components of adherence between these groups.

Whereas vegetarians might violate their dietary pattern knowingly and willingly in some cases, perhaps due to a craving for meat, other scenarios may occur in which a vegetarian eats meat unknowingly. Consider our earlier vignette vegetarian dining at the dinner party. In the end of this story, she decides to stick to her diet and have the bean chili. After dinner, she thanks the host for preparing a vegetarian dish, only for the host to inform her that the chili contained small chunks of ground beef for flavoring. In such a scenario, would an animal-motivated, health-motivated, or environmentally motivated vegetarian be most upset? Evidence exists to suggest that the animal-motivated vegetarian would be.

Through in-depth interviews, Hamilton (2006) found that when thinking about either how they have felt in the past or how they would feel hypothetically after eating meat inadvertently, ethically motivated vegetarians—but not health-motivated vegetarians—tended to report feelings of anger, anxiety, and guilt. Similarly, Rozin and colleagues (1997) found that ethically motivated vegetarians have more emotional reactions to meat consumption. Rozin et al. (1997) speculate that unintended dietary violations would disturb ethically motivated vegetarians more than they would health-motivated vegetarians because ethically motivated vegetarians are more disgusted by meat. Likewise, Rothgerber (2015) found that greater meat disgust explains why vegetarians feel guiltier about violating their diets than do conscientious omnivores. As such, having a higher level of disgust toward meat, animal-motivated vegetarians may be more upset than would either health-motivated or environmentally motivated vegetarians to learn that a meal they just consumed contained meat.

The current research: aims and hypotheses

In the current research, I aimed to provide more nuanced insights into ethically motivated vegetarianism. In Study 1, I investigated the extents to which vegetarians with

animal, health, and environmental motivations differ in their dietary goal orientations. Whereas concerns about animals and the environment tend to be intertwined with moral judgments and altruistic aims, concerns about personal health relate to desires to benefit one's own well-being and thus should correspond to a stronger personal goal orientation (Böhm and Pfister 2005; Ruby 2012). Accordingly, I hypothesized that both animal-motivated and environmentally motivated vegetarians would have higher prosocial and moral goal orientations than would health-motivated vegetarians and that health-motivated vegetarians would have a higher personal goal orientation than would either animal-motivated or environmentally motivated vegetarians. I set no specific hypotheses regarding how animal-motivated and environmentally motivated vegetarians would compare to one another on any goal orientation.

In Study 2, I sought to distinguish animal-motivated and environmentally motivated vegetarians from one another, theorizing these two groups would construe matters surrounding dietary adherence divergently. First, I hypothesized that animal-motivated vegetarians would exhibit greater disgust toward meat than would either health-motivated vegetarians or environmentally motivated vegetarians. Second, I hypothesized that animal-motivated vegetarians would have a higher dietary strictness than would either health-motivated vegetarians or environmentally motivated vegetarians. Third, I hypothesized that animal-motivated vegetarians would be more upset than would either health-motivated or environmentally motivated vegetarians to learn that a meal they just consumed contained meat. I predicted that disgust toward meat would mediate both of the relationships outlined in these latter two hypotheses.

As scholars have highlighted previously (e.g., Janssen et al. 2016; Rosenfeld and Burrow 2017a, b; Stiles 1998), vegetarians with varying forms of ethical motivations may construe meat avoidance in different ways, such that adopting an ethical-health dichotomy in studying vegetarian motivation may overlook meaningful variance. Still, however, little is known about this area of inquiry. In the current studies, I set to advance the current literature on vegetarianism and dietary motivation through implementing three procedures: first, by distinguishing animal and environmental motivations from one another, as opposed to grouping them together into a single category of ethical motivation; second, by documenting the relationship between animal, health, and environmental motivations and the dietarian identity framework's prosocial, personal, and moral goal orientations; and third, by examining the mediating role of meat disgust in the link between vegetarian motivation and dietary adherence.

Study 1

Method

Participants

Based on pilot testing, I estimated that approximately 34% of vegetarians recruited from Amazon Mechanical Turk (MTurk)¹ would report that their main dietary motivation was animals, 28% health, 8% the environment, and 6% either some other or no specific motivation, and that 24% would report being unable to choose which of multiple motivations was most important to them (i.e., mixed-motive). Taking this estimation into account, a power analysis indicated that a sample size of 513 participants would be sufficient to detect medium effect sizes (Cohen's $d=0.5$) between any two of the three groups of animal-, health-, and environmentally motivated vegetarians with at least 80% power at a significance threshold of $p=.05$.

Taking into consideration my plan to exclude participants who failed an attention check—which instructed them to leave their response to one of the survey questions blank—I recruited a total of 550 adult vegetarian participants (i.e., those who self-identified as vegetarian and/or vegan) from the United States via MTurk. Of these participants, 403 indicated that their main reason for being a vegetarian was for animals, health, or the environment and were retained in this study. Then, after excluding 42 participants who failed an attention check, 361 participants (51% female) between the ages of 18 and 78 ($M_{\text{age}} = 33.50$, $SD = 10.75$) were retained for analyses. Of these participants, 140 indicated that their main reason for being a vegetarian was for animals, 199 for health, and 22 for the environment.

Measures

Dietary goal orientations

Dietary goal orientations were assessed using Rosenfeld and Burrow's (2018) Diarian Identity Questionnaire (DIQ) prosocial, personal, and moral motivational orientations subscales. These scales began with an initial item that assessed which of the following animal products participants generally excluded from their diets: red meat, poultry, fish,

egg, and dairy. If participants generally ate all of these foods groups, they were instructed to select a sixth response that read, "I generally eat all of these food groups." Below this item was a prompt highlighting that, for the rest of the survey, a participant's "dietary pattern" referred to those foods he or she indicated above. Following this dietary pattern item were the prosocial, personal, and moral orientations scales. An example item for prosocial orientation ($\alpha=0.94$) included "I view my dietary pattern as a way of making the world a better place for others." An example item for personal orientation ($\alpha=0.84$) included "I follow my dietary pattern because I am concerned about the effects of my food choices on my own well-being." An example item for moral orientation ($\alpha=0.91$) included "I feel that I have a moral obligation to follow my dietary pattern." Responses to all items ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

Procedure

After consenting to take part in this research, participants first indicated their specific primary motivation for being a vegetarian. Then, participants completed the prosocial, personal, and moral goal orientation scales in a randomized order. Next, participants indicated whether they consider themselves, more specifically, to be vegetarian or vegan. Lastly, participants completed demographic questions.

Results

All confirmatory analyses were preregistered via Open Science Framework (OSF) (see <https://osf.io/kbm4d/register/5771ca429ad5a1020de2872e> for preregistration). Data and analysis scripts are available at <https://osf.io/ujq7v/>.

Planned contrasts within one-way analyses of variance (ANOVAs) revealed support for all hypotheses (see Table 1 for cell descriptive statistics). Animal-motivated vegetarians reported higher levels of prosocial orientation, $t(358)=8.40$, $p<.001$, $d=0.94$, and moral orientation, $t(356)=9.48$, $p<.001$, $d=1.06$, than did health-motivated vegetarians. Environmentally motivated vegetarians reported higher levels of prosocial orientation, $t(358)=4.26$, $p<.001$, $d=0.98$, and moral orientation, $t(356)=3.16$, $p=.002$, $d=0.73$, than did health-motivated vegetarians. Health-motivated vegetarians reported a higher level of personal orientation than did either animal-motivated vegetarians, $t(358)=3.37$, $p<.001$, $d=0.37$, or environmentally motivated vegetarians, $t(358)=2.99$, $p=.003$, $d=0.66$.

Exploratory analyses indicated that animal-motivated and environmentally motivated vegetarians did not report different levels of prosocial orientation, $t(358)=0.13$, $p=.89$, $d=0.04$,

¹ Amazon Mechanical Turk (MTurk) is a crowd-sourced labor pool that is often used for research data collection. Investigators can upload a survey onto MTurk's website, along with a description of the survey (e.g., how long it will take to complete, what tasks participants will be asked to do, and how much money participants will be compensated) for prospective participants to view. Participants can complete surveys of their choosing and receive payments through MTurk's platform after submitting a completed survey.

Table 1 Dietary goal orientation differences between vegetarians motivated by animals, health, and the environment, as assessed on scales ranging from 1 to 7

Dietary goal orientation	Animal (<i>n</i> = 140) Mean (SD)	Health (<i>n</i> = 199) Mean (SD)	Environment (<i>n</i> = 22) Mean (SD)	<i>F</i> value	Partial eta sq
Prosocial	5.32 (1.31)	3.90 (1.69)	5.37 (1.30)	38.70***	0.18
Personal	5.45 (1.36)	5.91 (1.14)	5.08 (1.38)	8.45***	0.05
Moral	5.73 (1.31)	4.06 (1.79)	5.20 (1.30)	45.73***	0.20

* $p < .05$; ** $p < .01$; *** $p < .001$

personal orientation, $t(358) = 1.31$, $p = .19$, $d = 0.27$, or moral orientation, $t(356) = 1.47$, $p = .14$, $d = 0.41$.

Discussion

These results suggest that vegetarians motivated by concerns about animals and the environment exhibit different goal orientations than do vegetarians motivated by health. In particular, both animal-motivated and environmentally motivated vegetarians exhibited stronger prosocial and moral goal orientations than did health-motivated vegetarians, whereas health-motivated vegetarians exhibited a stronger personal goal orientation than did either animal-motivated or environmentally motivated vegetarians. Thus, stronger aims to benefit causes beyond themselves and to adhere to their moral principles distinguish animal-motivated and environmentally motivated vegetarians from health-motivated vegetarians, whereas a stronger aim to improve their own well-being distinguishes health-motivated vegetarians from either animal-motivated or environmentally motivated vegetarians.

Despite having lower personal goal orientation than health-motivated vegetarians, both animal-motivated and environmentally motivated vegetarians exhibited levels of personal orientation that were similarly as strong as their prosocial and moral orientations. Health-motivated vegetarians, meanwhile, reported being much more personally oriented than they were either prosocially or morally oriented. As such, vegetarians who are motivated by concerns about animals or the environment view their diets as encompassing strong prosocial, personal, and moral aims, whereas vegetarians motivated by health view their diets as a particularly self-focused pursuit. Animal-motivated and environmentally motivated vegetarians did not differ from one another on any goal orientation, suggesting that these two groups of vegetarians may have similar aims in mind when it comes to following their dietary patterns.

Study 2

Method

Participants

Based on the results of Study 1, I estimated that approximately 28% of vegetarians recruited from MTurk would report that their main dietary motivation was animals, 40% health, 5% the environment, and 7% either some other or no specific motivation, and that 20% would report being unable to choose which of multiple motivations was most important to them (i.e., mixed-motive). Taking this estimation into account, a power analysis indicated that 760 participants would be needed to detect medium effect sizes between animal-motivated vegetarians and either health-motivated or environmentally motivated vegetarians with at least 80% power at a significance threshold of $p = .05$. This sample would also provide more than 80% power to detect medium effect sizes between health-motivated and environmentally motivated vegetarians. An additional power analysis indicated that 760 participants would provide more than 80% power to detect medium mediation effect sizes conducting distribution-of-the-product confidence limits for the indirect effect (Fritz and MacKinnon 2007).

Taking into consideration my plan to exclude participants who failed an attention check—which, as in Study 1, instructed them to leave their response to one of the survey questions blank—I recruited a total of 850 adult vegetarian participants from the United States via MTurk. Of these participants, 626 indicated that their main reason for being a vegetarian was for animals, health, or the environment and were retained in this study. Then, after

Table 2 Differences between vegetarians motivated by animals, health, and the environment in terms of disgust toward meat, dietary strictness, and imagined degree of feeling upset from eating meat accidentally, as assessed on scales ranging from 1 to 7

Measure	Animal (<i>n</i> = 195) Mean (SD)	Health (<i>n</i> = 319) Mean (SD)	Environment (<i>n</i> = 48) Mean (SD)	<i>F</i> value	Partial eta sq
Disgust	5.22 (1.42)	3.87 (1.70)	3.61 (1.72)	47.38***	0.15
Strictness	6.03 (1.44)	5.00 (1.75)	4.94 (1.62)	25.45***	0.08
Upset	5.71 (1.38)	4.72 (1.65)	4.33 (1.65)	29.67***	0.10

* $p < .05$; ** $p < .01$; *** $p < .001$

excluding 64 participants who failed an attention check, 562 participants (52% female) between the ages of 18 and 71 ($M_{\text{age}} = 32.14$, $SD = 9.50$) were retained for analyses. Of these participants, 195 indicated that their main reason for being a vegetarian was for animals, 319 for health, and 48 for the environment.

Measures

Meat disgust

Meat disgust was assessed using a 4-item scale ($\alpha = 0.87$) adapted from Rozin et al. (1997). These items included, “I dislike meat because of where it comes from,” “The thought of eating meat makes me nauseous,” “Eating meat is repulsive or disgusting,” “If a tiny drop of meat broth were to fall into a food I was eating, it would ruin that food for me,” and were measured via a Likert-type scale of 1 (Strongly Disagree) to 7 (Strongly Agree).

Dietary strictness

Dietary strictness was assessed using a varied version of Rosenfeld and Burrow’s (2018) 3-item DIQ strictness subscale. Instead of assessing the extent to which participants follow their idiosyncratic dietary pattern (i.e., avoiding some combination of red meat, poultry, fish, egg, and dairy), as the DIQ strictness scale does conventionally, the strictness scale in the current study assessed the extent to which participants refrain from eating meat. For example, the original (reverse-scored) DIQ strictness item, “From time to time, I eat foods that go against my dietary pattern,” was adapted to “From time to time, I eat meat” for the current study. Equivalent adaptations were made for the other two DIQ strictness items. Responses to all items ranged from 1 (Strongly Disagree) to 7 (Strongly Agree). This scale exhibited high internal consistency ($\alpha = 0.92$).

Imagined reaction to eating meat accidentally

The extent to which participants would be upset to learn that they consumed meat accidentally was assessed using a

single item that read, “If you were to find out that a meal you just ate had meat in it, how upset would you be?” Responses ranged from 1 (Not At All Upset) to 7 (Extremely Upset).

Procedure

After consenting to take part in this research, participants first indicated their primary motivation for being a vegetarian. Then, participants completed the meat disgust scale. Next, participants completed the measures of dietary strictness and imagined reaction to eating meat accidentally in a randomized order. Then, participants indicated whether they consider themselves, more specifically, to be vegetarian or vegan. Lastly, participants completed demographic questions.

Results

All confirmatory analyses were preregistered via OSF (see <https://osf.io/h9xg6/register/5771ca429ad5a1020de2872e> for preregistration). Data and analysis scripts are available at <https://osf.io/74tg2/>. See Table 2 for cell descriptive statistics.

Mediation was tested using the four steps of regression proposed by Baron and Kenny (1986), along with distribution-of-the-product confidence limits for the indirect effect conducted through the RMediation package in R (Tofiqhi and MacKinnon 2011).

First, I tested my prediction that animal-motivated vegetarians’ greater feelings of disgust toward meat would explain why they follow their diets more strictly than do health-motivated vegetarians. Animal motivation was dummy coded as 1 and health motivation as 0. Animal-motivated vegetarians reported having a higher dietary strictness than did health-motivated vegetarians ($\beta = 1.03$, $p < .001$). Animal-motivated vegetarians exhibited greater meat disgust than did health-motivated vegetarians ($\beta = 1.35$, $p < .001$). Greater meat disgust, in turn, predicted higher dietary strictness ($\beta = 0.31$, $p < .001$), controlling for motivation. The direct effect of motivation on strictness was reduced when controlling for meat disgust but remained significant

($\beta = 0.62, p < .001$). Distribution-of-the-product confidence limits for the indirect effect of motivation on strictness through meat disgust did not include zero, 95% CI [0.28, 0.57], suggesting that meat disgust partially mediated the link between vegetarian motivation (animal vs. health) and strictness.

Second, I tested my prediction that animal-motivated vegetarians' greater feelings of disgust toward meat would explain why they follow their diets more strictly than do environmentally motivated vegetarians. Animal motivation was dummy coded as 1 and environmental motivation as 0. Animal-motivated vegetarians reported having a higher dietary strictness than did environmentally motivated vegetarians ($\beta = 1.08, p < .001$). Animal-motivated vegetarians exhibited greater meat disgust than did environmentally motivated vegetarians ($\beta = 1.61, p < .001$). Greater meat disgust, in turn, predicted higher dietary strictness ($\beta = 0.39, p < .001$), controlling for motivation. The direct effect of motivation on strictness was no longer significant when controlling for meat disgust ($\beta = 0.45, p = .06$). Distribution-of-the-product confidence limits for the indirect effect of motivation on strictness through meat disgust did not include zero, 95% CI [0.39, 0.92], further suggesting that meat disgust fully mediated the link between vegetarian motivation (animal vs. environment) and strictness.

Third, I tested my prediction that animal-motivated vegetarians' greater feelings of disgust toward meat would explain why they would be more upset about eating meat accidentally than would health-motivated vegetarians. Animal motivation was dummy coded as 1 and health motivation as 0. Animal-motivated vegetarians reported that they would be more upset to eat meat accidentally than did health-motivated vegetarians ($\beta = 0.99, p < .001$). As reported above, animal-motivated vegetarians exhibited greater meat disgust than did health-motivated vegetarians ($\beta = 1.35, p < .001$). Greater meat disgust, in turn, predicted greater upset at the thought of eating meat accidentally ($\beta = 0.56, p < .001$), controlling for motivation. The direct effect of motivation on upset was no longer significant when controlling for meat disgust ($\beta = 0.24, p = .053$). Distribution-of-the-product confidence limits for the indirect effect of motivation on upset through meat disgust did not include zero, 95% CI [0.57, 0.94], further suggesting that meat disgust fully mediated the link between vegetarian motivation (animal vs. health) and imagined degree of upset from eating meat accidentally.

Fourth, I tested my prediction that animal-motivated vegetarians' greater feelings of disgust toward meat would explain why they would be more upset about eating meat accidentally than would environmentally motivated vegetarians. Animal motivation was dummy coded as 1 and environmental motivation as 0. Animal-motivated vegetarians reported that they would be more upset to eat meat accidentally than did environmentally motivated vegetarians

($\beta = 1.38, p < .001$). As reported above, animal-motivated vegetarians exhibited greater meat disgust than did environmentally motivated vegetarians ($\beta = 1.61, p < .001$). Greater meat disgust, in turn, predicted greater upset at the thought of eating meat accidentally ($\beta = 0.57, p < .001$), controlling for motivation. The direct effect of motivation on upset was reduced when controlling for meat disgust but remained significant ($\beta = 0.47, p = .02$). Distribution-of-the-product confidence limits for the indirect effect of motivation on upset through meat disgust did not include zero, 95% CI [0.62, 1.24], suggesting that meat disgust partially mediated the link between vegetarian motivation (animal vs. environment) and imagined degree of upset from eating meat accidentally.

Exploratory analyses: comparing health-motivated and environmentally motivated vegetarians

I conducted exploratory analyses to compare health-motivated and environmentally motivated vegetarians using Bonferroni correction to adjust for multiple testing. I tested for differences between health-motivated and environmentally motivated vegetarians with respect to meat disgust, dietary strictness, and imagined reaction to eating meat accidentally. To control for an inflated chance of reporting a type I error across these three tests, I evaluated their outputs at a significance threshold of $p = .0167$.

Health-motivated and environmentally motivated vegetarians did not report significantly different levels of disgust toward meat, $t(558) = 1.06, p = .29, d = 0.15$, strictness, $t(559) = 0.22, p = .83, d = 0.04$, or imagined upset at the thought of eating meat accidentally, $t(559) = 1.60, p = .11, d = 0.24$.

Discussion

Overall, I found support for my predictions that animal-motivated vegetarians' greater feelings of disgust toward meat would explain why they follow their diets more strictly and would be more upset if they were to eat meat accidentally than would either health-motivated or environmentally motivated vegetarians. Animal-motivated vegetarians reported a higher dietary strictness than did either health-motivated vegetarians (partially mediated by meat disgust) or environmentally motivated vegetarians (fully mediated by meat disgust). Moreover, animal-motivated vegetarians reported that they would be more upset if they were to eat meat accidentally than did either health-motivated vegetarians (fully mediated by meat disgust) or environmentally motivated vegetarians (partially mediated by meat disgust). Thus, being more disgusted by meat may lead animal-motivated vegetarians to adhere to their diets more stringently than do either health-motivated or environmentally motivated vegetarians. The presence of partial mediation in two of

these four models, moreover, suggests that either animal motivation itself, or some other untested factor, may play a direct role in promoting vegetarians' dietary adherence, irrespective of meat disgust. Health-motivated and environmentally motivated vegetarians did not differ in the extents to which they were disgusted by meat, adhered to their diets, or imagined they would be upset if they were to eat meat accidentally.

General discussion

Taken together, these two studies suggest that environmentally motivated vegetarians resemble animal-motivated vegetarians more closely in some regards and health-motivated vegetarians more closely in other regards. In Study 1, I found that environmentally motivated vegetarians resembled animal-motivated vegetarians in construing their diets as a means of achieving more prosocial and moral, and less personal, goals than did health-motivated vegetarians. However, in Study 2, I found that environmentally motivated vegetarians resembled health-motivated vegetarians in reporting lower levels of disgust toward meat and dietary adherence than did animal-motivated vegetarians. Stronger feelings of disgust toward meat, moreover, explained why animal-motivated vegetarians exhibited greater dietary adherence than did either health-motivated or environmentally motivated vegetarians. These findings lend support for Rozin et al. (1997) reasoning that having a stronger feeling of disgust toward meat may lead ethically motivated vegetarians—who ground their diets in concerns about animals—to be more disturbed by unintended dietary violations than would health-motivated vegetarians.

Ethically motivated eating behavior can take on multiple forms—here, for instance, going vegetarian for animals versus the environment. When it comes to vegetarian dieting, both of these ethical motivations embody highly prosocial and moral goals: Animal-motivated and environmentally motivated vegetarians seek to benefit social causes that extend beyond their own welfare and reflect their moral values. Health-motivated vegetarianism, on the other hand, embodies a predominantly personal goal. These findings support existing perspectives on vegetarian motivation (e.g., Fox and Ward 2008; Greenebaum 2012; Rosenfeld and Burrow 2017a, b). Although animal and environmental motivations encompass similar types of goals, these two motivations can predict food attitudes and actual eating behavior differently. Thus, as some investigators have done previously (e.g., Fox and Ward 2008; Janssen et al. 2016; Lindeman and Väänänen 2000), it may be beneficial to distinguish between these motivations.

The current findings shed light on why many people self-identify as vegetarian yet eat meat on occasion (e.g.,

Rothgerber 2017). For one, vegetarians contributing to this phenomenon are more likely to be motivated by health or the environment, rather than animals. Although claims about causality cannot be made from this correlational research, the available state of evidence suggests that construing one's diet as grounded in a desire to benefit animals may help individuals adhere to a vegetarian diet more successfully. Concerns about animals associate with greater disgust toward meat, which in turn may even lead vegetarians to imagine the act of eating meat as an unpleasant experience. What motivates people to go vegetarian, and how disgusted they feel by meat, have emerged as factors relevant to dietary adherence outcomes. Given that meat reduction is suggested as a way of improving public health and benefitting the environment (McMichael et al. 2007), it is important to understand these and other processes that affect how people maintain meat-reduced diets.

The current findings can also inform what empirical questions investigators should pose in their research, particularly when it comes to testing predictions derived from theories of morality and identity. Not only might animal-motivated and environmentally motivated vegetarians' moral reasoning shape their dietary adherences, but also dietary adherence may interact with social identity aspects of vegetarianism. Because vegetarianism is a social identity grounded in food choice (Rosenfeld and Burrow 2017a), a vegetarian's low dietary adherence may impose identity threats by challenging his or her dietary group membership status. Following their diets more loosely, health-motivated and environmentally motivated vegetarians may be more susceptible to identity threats and may hold more relaxed standards for defining vegetarian identity status than do animal-motivated vegetarians.

Throughout both of the studies presented here, I examined dietary motivation, goal orientations, meat disgust, and dietary adherence among vegetarians as a whole (i.e., vegetarians and vegans, collectively). Yet distinguishing vegans from other vegetarians can often provide valuable insights and has become the focus of much research in recent years (Rosenfeld 2018). Relative to other vegetarians, vegans exhibit stronger prosocial, personal, and moral goal orientations yet exercise a similar degree of dietary adherence (Rosenfeld 2019). Matters of dietary adherence, nevertheless, can encompass different meanings for vegetarians and vegans, as these two groups follow different dietary patterns (e.g., vegans eschew egg and dairy but vegetarians typically consume these foods). It would be informative to know more about how vegans may think about dietary adherence differently from vegetarians—particularly whether they view eating meat as a more severe dietary violation than eating egg or dairy, along with why this might be.

Although animal-motivated and environmentally motivated vegetarians construe their diets as morally oriented

to similar extents, they may moralize vegetarianism in different ways, ascribing different types of values to their dietary preferences (Rozin et al. 1997). In this paper, I have reasoned that animal-motivated vegetarians' greater feelings of disgust toward meat—and the implications that heightened disgust has for dietary adherence—distinguish them from environmentally motivated vegetarians. Although future research should be needed to validate causal mechanisms, divergent means of moralizing animal-driven and environmentally driven food choices may invoke moral emotions to varying extents. These moral emotions may in turn shape how strictly vegetarians adhere to their diets. An interesting avenue for future research may be to examine the roles of animal-meat dissociation (e.g., Kunst and Haugestad 2018; Kunst and Hohle 2016; Ruby and Heine 2012) and perceived moral standing and mental capacities of farm animals (e.g., Bastian et al. 2012; Bratanova et al. 2011; Caviola et al. 2018; Loughnan et al. 2010) in shaping feelings of meat disgust and standards of dietary adherence among vegetarians with different motivations.

The psychological implications of vegetarians' dietary violations also warrant further attention, particularly as they relate to identity and morality. Prior work has found that ethically motivated vegetarians judge other vegetarians' violations of eating meat as worse than do health-motivated vegetarians (Rothgerber 2014b). Distinguishing between animal-motivated and environmentally motivated vegetarians' perceptions of such violations can extend this line of inquiry further. From the acting vegetarian's perspective, moreover, to self-identify as a vegetarian yet still eat meat may threaten both an individual's feelings of authenticity and his or her dietary group membership. How do vegetarians resolve these types of identity threats? Might vegetarians with different motivations overcome dietary violations through different psychological strategies?

Future research should clarify ways in which environmentally motivated vegetarians construe their food choices as not only moral but also prosocial. The current findings suggest that environmentally motivated vegetarians have prosocial aims as strong as those of animal-motivated vegetarians. However, the meaning of diet-related prosociality may vary between these two groups. For vegetarians who eschew meat for animal concerns, prosocial intentions likely stem out of attributing mind to farm animals and seeking to benefit those sentient beings. Environmentally motivated vegetarians, on the other hand, are principally concerned about the effects of their food choices on the earth's well-being. The earth, notably, lacks mind. Nevertheless, following a vegetarian diet to benefit the environment may be intertwined with the aim of benefitting animals, as the earth is inhabited by animals who do possess mind. To what extent does mind perception relate to environmental motivations? Is the desire to benefit

the environment simply a means of benefitting beings that inhabit the environment, or can it serve as an end in itself?

The current findings lend support for the notion that animal and environmental concerns constitute psychologically different forms of ethical motivation. Yet future research may benefit further from examining different types of animal-oriented motivations among vegetarians—namely, animal rights and animal welfare. Whereas animal rights is the belief that that it is wrong to use animals for food, animal welfare is the belief that it is acceptable to use animals for food so as long as they are treated humanely (Francione 1995). Research has yet to investigate ways in which vegetarians who emphasize animal rights and animal welfare to varying extents compare to one another, despite these two beliefs embodying quite different meanings.

Another avenue for future inquiry is mixed-motive vegetarianism, whereby people report having multiple dietary motivations that are of equal importance to them. In order to test my hypotheses more precisely, I excluded mixed-motive vegetarians from analyses, including only vegetarians who nominated animals, health, or the environment as their primary motivation. Some research (e.g., Rothgerber 2013, 2014a) has begun to examine mixed-motive vegetarians, comparing them to vegetarians who nominate ethics or health as their primary motivation. Still, additional work is needed to understand how mixed-motive vegetarians form a hierarchy of their various dietary motivations, acquire and drop different motivations over time, draw upon certain motivations over others across varying contexts, and so forth.

In reviewing the literature on vegetarian motivation, Rosenfeld and Burrow (2017b) outline three methodological approaches. In one approach, investigators may focus on specific motivations, such as animals, health, the environment, religion, politics, and so forth. In a second approach, investigators may adopt an ethical-health framework, conceiving motivations as oriented toward either ethics or health (or both or neither). In a third approach, investigators may focus on goal orientations, including the extents to which people view their diets as oriented toward prosocial, personal, and moral goals. In Study 1, I integrated the first and third of these approaches, elucidating the relationships between specific motivations and goal orientations. In doing so, I assessed specific motivation as a categorical variable and goal orientation as a continuous variable. Future research should explore different methods for operationalizing these constructs as both categorical and continuous variables and as predictors, mediators, moderators, and outcomes. The extent to which goal orientations may mediate links between specific motivations and certain outcomes may be of particular interest.

Ultimately, in studying eating behavior, investigators should consider not only what food choices people make

but also why they make those choices. The current findings suggest that, whereas animal-motivated and health-motivated vegetarians are drastically different from one another, environmentally motivated vegetarians are more alike animal-motivated vegetarians in some regards and more alike health-motivated vegetarians in others. In particular, environmentally motivated vegetarians resemble animal-motivated vegetarians in terms of their goal orientations—how they see their diets as encompassing prosocial, personal, and moral goals—but resemble health-motivated vegetarians with respect to meat disgust and dietary adherence. Vegetarians motivated by a concern for animals, relative to vegetarians motivated by either health or the environment, appear to exercise a particularly high level of dietary adherence because they feel disgusted by the thought of eating meat. Further research is needed to identify additional ways in which animal-motivated and environmentally motivated vegetarians differ.

In sum, the current findings highlight value in studying ethical motivation with greater nuance, identifying meat disgust and dietary adherence as two factors that set animal-motivated and environmentally motivated vegetarians apart from one another. This observation adds to a large body of literature that has found a variety of important differences between ethically motivated and health-motivated vegetarians, highlighting that whereas vegetarians may think about animal and environmental motivations as similarly encompassing moral and prosocial aims, these two motivations may influence vegetarians' sensory-affective processes and actual eating behaviors divergently. By distinguishing more clearly between various types of ethical motivation, future research can acquire more theoretically informed and precise insights into the psychology of what motivates and maintains vegetarian eating behaviors.

Compliance with ethical standards

Conflict of interest The author declares that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in this research.

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