



From mostly vegetarian to fully vegetarian: Meat avoidance and the expression of social identity

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ABSTRACT

The dichotomous divide between vegetarians and omnivores seems clear: Omnivores eat meat, whereas vegetarians do not. Yet classifying people dichotomously as *vegetarian* or *omnivorous* overlooks a distinct group of people who limit their meat intake but still include some meat in their diets: a group of “mostly vegetarian” dieters called *flexitarians* (a term combining the words, “flexible” and “vegetarian”). Despite the estimated prevalence of flexitarianism in the United States hovering at approximately 20% to 30% of the population, we have little knowledge about how flexitarians construe their food choices. Through a preregistered study ($N = 718$), we identified psychological differences between flexitarians and full vegetarians as well as predictors of flexitarians’ openness to going fully vegetarian. Across all tests, social identity aspects of meat avoidance emerged as significant factors, over and above what motivations participants reported for avoiding meat. Findings suggest that social identity phenomena offer insights into how meat-avoiders construe not only their current, but also their prospective, food choices.

1. Introduction

The decision to forgo meat can readily become a defining social identity (Tajfel & Turner, 1985)—that of being a vegetarian (Rosenfeld & Burrow, 2017a). Identifying oneself as a vegetarian starkly contrasts the socially normative, often unlabeled, identity of being an omnivore (Joy, 2009). Drawing such a dichotomous divide between those who do and do not eat meat, however, overlooks a distinct, sizeable group of people who limit their meat intake yet still include meat in their diets: a group of “mostly vegetarian” dieters called *flexitarians* (a term derived from combining the words, “flexible” and “vegetarian”; Corrin & Papadopoulos, 2017; De Backer & Hudders, 2014; Derbyshire, 2017; Rosenfeld, 2018). With their eating behaviors resembling those of vegetarians at some times and those of omnivores at other times, flexitarians challenge conventionally “all or nothing” views on vegetarian versus omnivorous dietary patterns. This perspective invites psychological inquiry to unravel how individuals internalize various gradients of meat avoidance. Specifically, in what ways does the expression of social identity inform and reflect how flexitarians construe their current and prospective food choices?

Existing research has found that vegetarians and omnivores construe their eating behaviors divergently both in terms of moral judgment and as an expression of social identity (Bilewicz, Imhoff, &

Drogosz, 2011; De Backer & Hudders, 2015; Rosenfeld & Burrow, 2017a, 2018). For vegetarians, food choice is often a lifestyle, or salient ideology, one that is more intertwined with ecological and political concerns than it is for omnivores (Greenebaum, 2012; Lindeman & Sirelius, 2001; Lindeman & Stark, 1999; Ruby, 2008). Vegetarians also perceive the decision of whether or not to eat animal products as a more central and positive part of their identity than omnivores do (Joy, 2009; Rosenfeld & Burrow, 2018). What makes flexitarians a particularly intriguing group for research is that their dietary inclinations, attitudes toward meat, and moral judgments appear to lie in between those of vegetarians and omnivores who do not limit their meat consumption (Cliceri, Spinelli, Dinnella, Prescott, & Monteleone, 2018; De Backer & Hudders, 2015; Rosenfeld & Burrow, 2017c).

Whereas a sizeable literature exists documenting how vegetarians construe their diets (Rosenfeld, 2018; Ruby, 2012), much less is known about flexitarians, despite the number of flexitarians far outweighing the number of vegetarians. In the United States, for example, vegetarians comprise 5% of the population (Gallup, 2018), whereas estimated prevalences of flexitarianism range from 10% to 37%, depending on survey methodology (Rosenfeld & Burrow, 2017c; The Vegetarian Resource Group, 2016; Vegetarian Times Editors, 2008). With concerns about the adverse health and environmental impacts of meat consumption pressing (Willett et al., 2019), this dietary trend highlights the

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need to investigate two key questions aimed at better understanding meat-avoiders: (1) How different psychologically are flexitarians from vegetarians? That is, do flexitarians resemble vegetarians psychologically and only differ from vegetarians in terms of dietary behavior? Or does their decision to limit the amount of meat they eat *partially*, rather than to forgo meat *entirely*, correspond to a distinct way of construing their diets? (2) What behavioral, psychosocial, and demographic factors predict how open flexitarians are to going fully vegetarian? We sought to answer these questions in a highly powered, preregistered study. Identifying these factors can not only help consumers shift toward a more meat-reduced diet for the benefits of public health and environmental sustainability but also provide theoretical insights into how people internalize, express, and prospectively adopt new dietary patterns.

1.1. Comparing flexitarians and vegetarians

1.1.1. Probable differences in dietarian identity between flexitarians and vegetarians

1.1.1.1. Motivation for meat avoidance. We sought to understand flexitarianism in light of Rosenfeld and Burrow (2018) dietarian identity framework, which outlines motivational and social identity aspects of vegetarian and omnivorous eating behavior.

People vary in what motivations they have for avoiding meat. Rosenfeld and Burrow (2017a, 2017b, 2018) propose that meat-avoiders' motivations can be quantified along three dimensions: prosocial, personal, and moral motivations. Prosocial motivation refers to aims to benefit a cause beyond oneself; personal motivation to aims to benefits oneself; and moral motivation to aims to abide by one's principles of right and wrong. Might different aims spur the decision to reduce one's meat intake partially in contrast to the decision to forgo meat entirely?

Prior studies suggest that people who avoid consuming animal products entirely tend to be more ethically motivated than are people who avoid consuming animal products partially—for example, vegans more so than vegetarians (Haverstock & Forgays, 2012; Izmirlı & Phillips, 2011; Rosenfeld, 2019a, 2019b; Ruby, 2008) and vegetarians more than pescatarians (Rosenfeld & Tomiyama, 2019). Similarly, vegetarians are more likely to exhibit greater dietary motivations related to animals and the environment than are flexitarians (De Backer & Hudders, 2014, 2015). Still, a lingering unknown that may be valuable to document is the degree to which vegetarians and flexitarians draw upon *distinct* prosocial, personal, and moral aims in eating—the underlying psychology of why they make their food choices. Conceptualizations of vegetarian dietary motivations have traditionally been grounded in a dichotomy, such that individuals' reasons for eschewing meat may relate to either ethical or health motivations, or a combination of both (Jabs, Devine, & Sobal, 1998; Rothgerber, 2014a, 2014b, 2014c; Ruby, 2012). More recent theorizing and psychometric work by Rosenfeld and Burrow (2017a, 2017b, 2018) (also see Rosenfeld, 2019c), however, have suggested that individuals construe their meat avoidance with greater nuance. This newer perspective posits that people who voluntarily reduce their meat intake do so as a means of achieving goals—goals that can be prosocially, personally, or morally oriented to varying degrees. We predicted that vegetarians would have stronger prosocial and moral motivations than would flexitarians, yet set no prediction for personal motivation.

1.1.1.2. Social identity aspects of meat avoidance. A rich body of literature has investigated social identity aspects of vegetarianism (Fox & Ward, 2008; Greenebaum, 2012; Rosenfeld, 2018, 2019a, 2019c; Rothgerber, 2014b, 2014c). In contrast to motivational differences, however, empirical research related to social identity differences between vegetarians and flexitarians is far less developed. Prior findings from other domains of identity research, though, lent useful insights into hypotheses-generation.

Among vegetarians and flexitarians, dietarian identity centrality

reflects the extent to which avoiding meat is a predominant feature of one's overall identity (Rosenfeld & Burrow, 2018). We expected vegetarians to have higher centrality than flexitarians. First, the mere act of self-identifying as vegetarian itself may enhance centrality among people who forgo meat entirely, given that proclaiming a noun-based “lexicalized” label (e.g., “I am a vegetarian”) publicly signals social identification (Bryan, Walton, Rogers, & Dweck, 2011; Gelman & Heyman, 1999). Flexitarians, in contrast, would be less likely to adopt such a label. Second, theoretical perspectives on self-consistency (e.g., Festinger, 1957; Lecky, 1945) can suggest that an effect in the reverse direction of causality—whereby meat-avoiders with higher dietarian identity centrality may choose a vegetarian over a flexitarian diet in order to align their behaviors with their self-image.

Group differences in dietarian identity regards seemed probable as well. Whereas private regard reflects the extent to which vegetarians and flexitarians take pride in avoiding meat and look favorably upon their dietary in-group of meat-avoiders, public regard captures the extent to which vegetarians and flexitarians feel as if they are judged favorably by others for avoiding meat (Rosenfeld & Burrow, 2018). Based on the finding that omnivores look more favorably upon vegetarians who follow their diets flexibly than toward vegetarians who adhere strictly (Hornsey & Jetten, 2003), we posited that omnivores have more negative attitudes toward vegetarians than toward flexitarians. Vegetarians may become aware of these attitudes toward their group and thus exhibit lower public regard than flexitarians do.

Basic social identity processes shown in the domain of racial identity may inform predictions about dietarian identity private regard. Social identity theory (Tajfel & Turner, 1985) posits that people derive self-esteem from their memberships in various social categories. Members of marginalized racial backgrounds may benefit from deriving pride from their marginalized social identity (Chavous et al., 2003), and greater perceived threats due to one's marginalized position may promote in-group favoritism (Hewstone, Rubin, & Willis, 2002). Experiencing greater prejudice due to one's racial identity, furthermore, predicts higher private regard (Stevenson & Arrington, 2009). Vegetarianism is a stigmatized identity, with omnivores exhibiting many negative perceptions of vegetarians (Kellman, 2000; Markowski & Roxburgh, 2018; Minson & Monin, 2012). Constructing a high sense of private regard, and viewing one's meat avoidance in a favorable light, may thus enable vegetarians to maintain a positive self-image in the face of adverse social experiences and feelings of social stigma—relative to flexitarians, who, in contrast, would be less likely to experience these adversities.

Vegetarians may also have higher private regard, relative to flexitarians, because people who take pride in being a meat-avoider may be more driven prospectively to become vegetarian. People generally seek to make group memberships they hold in higher regard more central to their self-concept (Stryker & Serpe, 1982). Thus, people who look favorably upon being a meat-avoider may view giving up meat entirely—and in turn publicly self-identifying as vegetarian—as a promising benefit to their self-esteem (Plante, Rosenfeld, Plante, & Reysen, 2019).

A third form of regard, omnivorous regard, reflects the extent to which vegetarians and flexitarians judge other people positively versus negatively for eating meat (Rosenfeld & Burrow, 2017a, 2018). Although vegetarians, on average, are not judgmental of meat-eaters' food choices (Minson & Monin, 2012; Rosenfeld, 2019c), some vegetarians do evaluate people negatively for eating meat (Beardsworth & Keil, 1992; LeRette, 2014; Rosenfeld, 2019c). Understanding this attitude is important, as vegetarians who openly judge omnivores may put themselves at greater risk of being socially rejected by said omnivores (Minson & Monin, 2012). Drawing upon cognitive dissonance theory (e.g., Festinger, 1957), we reasoned that flexitarians—who, themselves, eat meat—would feel inconsistent should they judge people negatively for eating meat and thus would be motivated to lessen any negative affect they hold toward others' meat consumptions. Deciding to go vegetarian, however, may afford a means of alleviating any self-

directed negative affect or sense of cognitive dissonance that individuals with low omnivorous regard may face. Moreover, as low omnivorous regard (i.e., negative judgment of meat-eating) is theorized to be driven by strong moral motivations to avoid meat (Rosenfeld & Burrow, 2017a), vegetarians' stronger moral motivations may promote its development. Being a vegetarian in itself may even lower one's omnivorous regard due to greater internalized vegetarian stigma and threat awareness (Hewstone et al., 2002). As such, we posited that vegetarians would report lower omnivorous regard than would flexitarians.

1.1.1.3. Dietary duration. Lastly within dietarian identity, we examined duration—that is, the amount of time for which vegetarians and flexitarians have been avoiding meat. As no prior research to our knowledge had compared duration between vegetarians and flexitarians, or any similar test, we set no prediction for this comparison. With flexitarianism being an understudied eating behavior, it can be useful to know cross-sectionally whether restricting meat entirely or partially is associated with longer duration. Subsequent research, then, could investigate the underpinnings of any difference—namely, whether the one of these diets that is associated with a shorter duration is growing faster in popularity (and thus its followers have adopted the diet recently) or more difficult to sustain in the long term (i.e., high attrition), both of which may explain such a trend.

1.1.2. Probable predictors of vegetarian versus flexitarian status

Along with testing for bivariate differences between vegetarians and flexitarians, an additional aim within our research was to identify factors that uniquely predict whether one will be more likely to follow a vegetarian or a flexitarian diet in multivariate analysis. In addition to the seven dimensions of dietarian identity above—for which we set the same predictions as outlined for our bivariate comparisons—we considered three additional factors that might explain variance in meat-avoiders' dietary patterns, which included the prevalence of vegetarians in one's social network, the prevalence of vegetarians in one's local community, and gender.

The prevalence of vegetarianism varies by region within the U.S., with the Northeast, for example, having more than twice the prevalence than the South has (The Vegetarian Resource Group, 2016). This discrepancy creates different descriptive social norms with respect to vegetarianism across regions, which may lead people who live in communities wherein vegetarianism is prevalent to be more inclined to practice vegetarianism themselves (Burger et al., 2010; Higgs, 2015). Similarly, effects of social norms, along with perceptions of food availability, suggest that people who live in communities wherein vegetarianism is rare and food establishments lack vegetarian options may be averse to giving up meat.

The prevalence of vegetarianism within one's social network may also play a unique role. People who go vegetarian often face interpersonal conflicts with their meat-eating friends and family (Hirschler, 2011; LeRette, 2014; Rosenfeld, 2018; Twine, 2014). The decision to go fully vegetarian is one that yields meaningful social implications and alters one's sense of identity, often in unfavorable ways related to social stigma (Markowski & Roxburgh, 2018). For people with predominantly meat-eating friends and family members, going vegetarian—as opposed to flexitarian—may be more socially intimidating than it would be for people with a vegetarian-rich social network. Thus, we posited that having higher perceived prevalences of vegetarianism in one's local community and social network would be associated with being more receptive to vegetarian dieting, whereas lower prevalences would push one toward a flexitarian diet. An effect in the reverse direction of causality, whereby people befriend more vegetarians after becoming vegetarian themselves, may also be at play in explaining such a relationship.

Gender, too, may influence whether one chooses a vegetarian or

flexitarian diet. Meat consumption is associated with masculinity, and meat abstention with femininity (Browarnik, 2012; Mycek, 2018; Rosenfeld, 2018; Rothgerber, 2012; Ruby & Heine, 2011; Sobal, 2005). The majority of vegetarians, moreover, are women (Forestell & Nezelek, 2018; Pfeiler & Egloff, 2018; Rosenfeld, 2018; Ruby, 2012). If eating meat serves to maintain a masculine identity among men, whereas forgoing meat may threaten it, then men may be more likely to choose a flexitarian diet over a vegetarian diet. For example, flexitarian men could still eat meat selectively (e.g., in public) to achieve masculine status. Gender as a woman, thus, might predict vegetarian over flexitarian status.

1.2. Probable predictors of openness to going vegetarian among flexitarians

Evidence suggests that if more people were to go vegetarian, public health and environmental sustainability would improve (Willett et al., 2019). Although research documenting what barriers people have to going vegetarian is plentiful (see Rosenfeld, 2018 for review), less work has identified what factors uniquely explain why some people are more open to going vegetarian than others are. Posing this research question among a sample of flexitarians is particularly interesting, given that flexitarians have already curtailed their meat intake to some degree and thus likely view openness to going vegetarian as a more accessible construct, compared to omnivores who do not limit their meat intake. We considered all variables reviewed above as potential predictors of openness to going vegetarian among flexitarians. An additional predictor we considered was the frequency with which flexitarians eat meat, given that considerable heterogeneity in eating behavior exists among flexitarians: For some, eating a flexitarian diet means eating meat only once per month, whereas for others, it may mean eating meat once per day (Rosenfeld, Rothgerber, & Tomiyama, 2019). We reasoned that flexitarians who eat meat less frequently would be more open to going vegetarian.

1.3. The current study: aims and hypotheses

The first aim of this paper is to investigate dietarian identity differences between flexitarians and vegetarians. We hypothesized that, compared to vegetarians, flexitarians would have a lower centrality, lower private regard, higher public regard, higher omnivorous regard, lower prosocial motivation, and lower moral motivation. We set no specific predictions regarding whether vegetarians and flexitarians would differ on either personal motivation or duration. We also tested which of these seven dietarian identity constructs, along with the prevalence of vegetarians in their social network, perceived prevalence of vegetarians in their local community, and gender, would predict participants' statuses as vegetarian versus flexitarian, as to identify which factors uniquely distinguish vegetarians from flexitarians. We hypothesized that higher centrality, higher private regard, lower public regard, lower omnivorous regard, higher prosocial motivation, higher moral motivation, higher prevalence of vegetarians in social network, higher perceived prevalence of vegetarians in local community, and status as a woman would predict status as a vegetarian rather than flexitarian.

The second aim of this paper is to identify predictors of flexitarians' openness to going fully vegetarian. We hypothesized that higher private regard, lower omnivorous regard, higher prosocial motivation, higher moral motivation, lower meat consumption frequency, higher prevalence of vegetarians in one's social network, higher prevalence of vegetarians in one's local community, and status as a woman would predict greater openness to going vegetarian.

2. Materials and method

This study's sample size, materials, hypotheses, and analyses were preregistered via the Open Science Framework (OSF) (see https://osf.io/ce3d7/?view_only=01efbaa73459424bbac7b5ed32a05549 for preregistration).

Table 1
Demographic information of study participants.

Demographic	Frequency (Percentage)
Race	
White/Caucasian	557 (78%)
Black/African American	47 (7%)
Hispanic or Latinx	34 (5%)
Asian or Pacific Islander	57 (8%)
Native American	5 (1%)
Mixed race/ethnicity	17 (3%)
Other	1 (< 1%)
Income	
\$25,000 or less	112 (16%)
\$25,001 - \$50,000	193 (27%)
\$50,001 - \$80,000	207 (29%)
\$80,001 - \$120,000	137 (19%)
\$120,001 - \$200,000	55 (8%)
\$200,001 or more	13 (2%)
Educational Attainment	
Less than high school diploma	1 (< 1%)
High school diploma or equivalent (e.g., GED)	62 (9%)
Some college, but no degree	124 (17%)
Associate degree	82 (11%)
Bachelor's degree	337 (47%)
Graduate or professional degree	112 (16%)

2.1. Participants

Participants were 924 adults from the United States recruited via Amazon Mechanical Turk (MTurk). We recruited participants following various diets by advertising our survey in the following three ways across multiple rounds of data collection: “Cutting Back on Meat? Survey for people who limit their meat intakes,” “Survey on Meat Avoidance – for people who refrain from eating meat,” and “Survey on Food Preferences.”

Of the total 924 participants, 763 indicated that they follow a vegetarian ($n = 163$) or flexitarian ($n = 600$) diet and were retained in this study. After excluding six participants who indicated that they are neither male nor female, one participant who reported an impossible age, and 38 participants who failed an attention check in the survey, 718 participants (57% female) between the ages of 19 and 83 ($M_{\text{age}} = 40.22$, $SD = 12.87$) were retained for analyses (see Table 1 for demographic information). Of these participants, 154 were vegetarians and 564 were flexitarians (see “Dietary group membership” within the “Materials” section below for operationalizations of these dietary groups).

The data used for this study came from a sample (Rosenfeld et al., 2019) in which we previously investigated what factors predict the degree to which flexitarians subjectively feel “vegetarian”—that is, how strongly they identify with vegetarianism as a social category. Although that prior study is published, we preregistered the current investigation’s sample size, materials, hypotheses, and analyses prior to collecting any data (for this or the other publication). Thus, we ensured maximum transparency in our research and controlled our false positive rate. None of the analyses reported here duplicate analyses reported in Rosenfeld et al. (2019). In terms of sample size criteria, we set to recruit a minimum number of vegetarians (1 0 0), flexitarians (6 0 0), and omnivores (1 0 0). We ceased data collection once we reached our minimum sample size for each of these three groups.

Power analyses indicated that 100 vegetarians and 600 flexitarians would provide at least 80% power to detect small-medium between-group effects of $d = 0.31$ between flexitarians and vegetarians, more than 99% power to detect small-medium effect sizes of $r = 0.20$ for the bivariate correlations between our main predictors and openness to going vegetarian among flexitarians, 99% power to detect a small-medium effect size of $d = 0.35$ for the gender difference in openness to going vegetarian among flexitarians (assuming an equal number of men

and women), and more than 90% power to detect a small-medium effect size of $f^2 = 0.05$ in our regression model predicting flexitarians’ openness to going vegetarian. With 154 vegetarians and 564 flexitarians, our sample provided ample power to detect these effects.

2.2. Materials

2.2.1. Dietary group membership

Dietary group membership was assessed by the question, “Which of the following describes your diet most accurately when it comes to eating or not eating meat?” with four responses including “I do not eat meat,” “I limit my meat intake but I still include meat in my diet,” “I do not limit my meat intake,” and “None of the above describe my diet accurately.” Participants who selected the first response were classified as vegetarians and the second response as flexitarians. Participants who selected either the third or fourth responses were excluded from this study.

2.2.2. Meat consumption frequency

Meat consumption frequency was assessed by the question, “How often do you eat meat (i.e., red meat, poultry, fish/seafood)?” with the following 10 responses: “never,” “a few times per year,” “once per month,” “a few times per month,” “once per week,” “2 to 3 days per week,” “4 to 6 days per week,” “1 meal per day,” “2 meals per day,” and “3 or more meals per day.” These responses were coded respectively from 1 to 10. Participants selected one response to indicate their meat consumption frequency.

2.2.3. Dietarian identity

Dietarian identity was assessed using Rosenfeld and Burrow (2018) Dietarian Identity Questionnaire (DIQ), with a slight modification: Items within the DIQ were phrased in terms of “avoiding meat,” rather than “my dietary pattern” as to capture the expression of dietarian identity specific to vegetarianism and flexitarianism, both of which are defined by meat avoidance. We assessed seven dietarian identity constructs using the DIQ: centrality; private, public, and omnivorous regards; and prosocial, personal, and moral motivations. Table 2 presents an overview of each construct, including its conceptual definition, number of scale items, scale internal consistency in the current study, and an example scale item. We note that an eight construct within the full DIQ, dietary strictness, was not assessed because strictness lacks tangible meaning when considered in relation to flexitarianism’s aim of limiting, but not forgoing, meat.

2.2.4. Dietary duration

Dietary duration was assessed by the question, “For how long have you been avoiding meat?” with seven responses ranging including “Less than 1 month,” “Between 1 month–1 year,” “1–2 years,” “2–5 years,” “5–10 years,” “10–20 years,” and “More than 20 years,” with these responses coded respectively from 1 to 7. Participants selected one response to indicate their duration.

2.2.5. Prevalence of vegetarians in social network

Prevalence of vegetarians in one’s social network was assessed by the question, “How many of your friends and family members are vegetarian?” with responses ranging from 1 (None) to 5 (All of them).

2.2.6. Prevalence of vegetarians in local community

Prevalence of vegetarians in one’s local community was assessed by the question, “How common is it to be vegetarian in your local community?” with responses ranging from 1 (Not At All Common) to 5 (Very Common).

2.2.7. Openness to going vegetarian

Openness to going vegetarian was assessed by the question, “How open are you to going vegetarian or vegan at any upcoming point in

Table 2
Overview of dietarian identity constructs assessed by the DIQ in the current study.

DIQ Construct	Conceptual Definition	Number of Scale Items	α	Example Item
Centrality	The extent to which avoiding meat is a predominant feature of one's overall identity	5	0.96	Avoiding meat is an important part of who I am.
Private Regard	The extent to which one takes pride in avoiding meat and looks favorably upon one's dietary in-group of meat-avoiders	3	0.80	People who avoid meat should take pride in their food choices.
Public Regard	The extent to which one feels as if one is judged favorably by others for avoiding meat	3	0.94	Avoiding meat is associated with negative stereotypes. (reverse-scored)
Omnivorous Regard	The valence with which one judges other people for eating meat	7	0.95	It bothers me when people eat meat. (reverse-scored)
Prosocial Motivation	The extent to which one avoids meat to benefit a cause beyond oneself	6	0.96	Concerns about social issues motivate me to avoid meat.
Personal Motivation	The extent to which one avoids meat to benefit oneself	3	0.92	I avoid meat because I am concerned about the effects of my food choices on my own well-being.
Moral Motivation	The extent to which one avoids meat to abide by one's principles of right and wrong	3	0.93	I feel that I have a moral obligation to avoid meat.

your life?" with responses ranging from 1 (Not At All) to 7 (Very Open).

2.3. Procedure

First, participants consented to take part in this research. Then, participants completed survey materials, in blocks in the order presented above. Lastly, participants completed demographic questions, including their age, gender, race, educational attainment, and income. Participants received \$0.50 in compensation. This study protocol (IRB#19-000257) was approved by the Institutional Review Board at the University of California, Los Angeles, and informed consent was obtained from all study participants.

2.4. Data analysis

All analyses were conducted using R. First, to test for dietarian identity differences between flexitarians and vegetarians, we conducted independent samples *t*-tests—using Welch-adjustment when variances were unequal—to compare centrality; private, public, and omnivorous regards; prosocial, personal, and moral motivations between the two dietary groups. Because dietary duration used an ordinal response scale, we compared flexitarians and vegetarians on this variable using a nonparametric Mann-Whitney *U* test (we note that this analysis was suggested by a reviewer and thus diverges from our preregistration plan). We then conducted a logistic regression to test which factors uniquely predicted participants' statuses as vegetarian versus flexitarian.

Next, we conducted two sets of analyses to test our remaining research question: What behavioral, psychosocial, and demographic factors predict how open flexitarians are to going fully vegetarian? In the first set of analyses, we conducted correlation coefficients to test for bivariate relationships between each predictor variable and openness to going vegetarian. Spearman's rank correlation coefficients were conducted for meat consumption frequency and dietary duration, as these predictors involved ordinal data, whereas all other predictors were tested using Pearson product-moment correlation coefficients. In the second set of analyses, we conducted an ordinary least squares regression to test which factors uniquely predict flexitarians' openness to going vegetarian.

3. Results

Data and analysis scripts are available at https://osf.io/uh2a9/?view_only=59677fb192614ca38bfc47ac4eda51e0.

3.1. Dietarian identity differences between flexitarians and vegetarians

Data were consistent with all of our directional hypotheses: Compared to vegetarians, flexitarians reported lower centrality, lower private regard, higher public regard, higher omnivorous regard, lower prosocial motivation, and lower moral motivation (see Table 3). Significant differences between vegetarians and flexitarians also emerged for both personal motivation and duration, such that flexitarians had higher personal motivation (see Table 3) and a shorter duration ($W = 26794, p < .001$) than vegetarians did.

Over and above all other predictors, higher centrality, higher moral motivation, lower prevalence of vegetarians in one's local community, and lower educational attainment predicted that participants were more likely to be vegetarian than flexitarian (see Table 4).

3.2. Predictors of openness to going vegetarian among flexitarians

Among flexitarian participants, bivariate correlations indicated that higher centrality, higher private regard, lower omnivorous regard, higher prosocial motivation, higher personal motivation, higher moral motivation, longer dietary duration, and lower meat consumption

Table 3
Dietarian identity differences between vegetarians and flexitarians. Significant differences are displayed in bold font.

Dietarian Identity	Vegetarians (n = 154)	Flexitarians (n = 564)	95% CI of Difference	t	d	p
	Mean (SD)	Mean (SD)				
Centrality	5.52 (1.36)	3.80 (1.50)	[1.45, 1.98]	12.84***	1.20	< 0.001
Private Regard	5.53 (0.94)	5.02 (1.01)	[0.33, 0.68]	5.61***	0.52	< 0.001
Public Regard	3.37 (1.56)	3.89 (1.49)	[-0.79, -0.25]	3.78***	0.34	< 0.001
Omnivorous Regard	4.79 (1.52)	5.65 (1.21)	[-1.13, -0.61]	6.53***	0.63	< 0.001
Prosocial Motivation	5.10 (1.48)	4.00 (1.65)	[0.81, 1.39]	7.47***	0.70	< 0.001
Personal Motivation	5.92 (1.22)	5.59 (1.22)	[0.12, 0.56]	3.04**	0.27	0.002
Moral Motivation	5.06 (1.67)	3.50 (1.61)	[1.27, 1.85]	10.53***	0.95	< 0.001

Table 4
Logistic regression predicting status as vegetarian rather than flexitarian. Significant predictors are displayed in bold font.

Predictor	Odds Ratio	b	SE b	R ²	p
				0.26	
Centrality	2.11***	0.74	0.10		< 0.001
Private Regard	0.78	-0.24	0.14		0.087
Public Regard	0.94	-0.06	0.08		0.451
Omnivorous Regard	0.99	-0.01	0.10		0.929
Prosocial Motivation	0.91	-0.09	0.10		0.350
Personal Motivation	1.14	0.14	0.11		0.203
Moral Motivation	1.44***	0.36	0.10		< 0.001
Prevalence of Vegetarians in Social Network	1.14	0.13	0.14		0.326
Prevalence of Vegetarians in Local Community	0.78*	-0.25	0.12		0.045
Gender	1.25	0.22	0.22		0.319
Race	0.96	-0.05	0.10		0.630
Income	1.17	0.16	0.10		0.095
Education	0.81*	-0.21	0.10		0.027
Age	0.98	-0.02	0.01		0.100

Table 5
Bivariate correlations between main predictor variables of interest and openness to going vegetarian among flexitarians. Significant correlations are displayed in bold font.

Predictor	r	p
Meat Consumption Frequency	-0.15	< 0.001
Dietary Duration	0.15	< 0.001
Centrality	0.30	< 0.001
Private Regard	0.40	< 0.001
Public Regard	-0.08	0.081
Omnivorous Regard	-0.22	< 0.001
Prosocial Motivation	0.38	< 0.001
Personal Motivation	0.22	< 0.001
Moral Motivation	0.35	< 0.001
Prevalence of Vegetarians in Social Network	0.08	0.090
Prevalence of Vegetarians in Local Community	0.02	0.600

frequency were associated with greater openness to going vegetarian (see Table 5). Because our other predictor variable, gender, was categorical, we conducted an independent samples t-test to compare openness to going vegetarian between men and women. As hypothesized, flexitarian women (M = 4.97, SD = 1.76) reported being more open to going vegetarian than flexitarian men did (M = 4.42, SD = 1.69), t(5 08) = 3.61, p < .001, d = 0.32, 95% CI [0.25, 0.86].

Over and above all other predictors, higher private regard, higher prosocial motivation, higher personal motivation, and being a woman predicted that flexitarians were more open to going vegetarian (see Table 6).

4. Discussion

These results provide meaningful insights into both aims of our

Table 6
Regression predicting openness to going vegetarian among flexitarians. Significant predictors are displayed in bold font. For gender, men were coded as 0 and women as 1.

Predictor	b	SE b	β	R ²	p
				0.27	
Meat Consumption Frequency	-0.08	0.05	-0.06		0.123
Dietary Duration	0.07	0.05	0.06		0.167
Centrality	0.04	0.06	0.03		0.512
Private Regard	0.36***	0.08	0.21		< 0.001
Public Regard	-0.02	0.05	-0.02		0.668
Omnivorous Regard	-0.06	0.08	-0.04		0.451
Prosocial Motivation	0.17**	0.06	0.16		0.005
Personal Motivation	0.20***	0.06	0.14		< 0.001
Moral Motivation	0.11	0.07	0.10		0.135
Prevalence of Vegetarians in Social Network	-0.01	0.09	0.00		0.949
Prevalence of Vegetarians in Local Community	-0.01	0.08	-0.01		0.853
Gender	0.35*	0.14	0.10		0.012
Race	-0.07	0.06	-0.04		0.279
Income	-0.05	0.06	-0.04		0.393
Education	-0.01	0.06	-0.01		0.824
Age	0.00	0.01	0.00		0.959

study. First, we found that flexitarians and vegetarians differed significantly on all dimensions of dietary identity we assessed. Compared to vegetarians, flexitarians reported that they see their diets as less intertwined with their identity (lower centrality), take less pride in following their diets (lower private regard), feel as if they are judged less negatively for following their diets (higher public regard), judge other people less negatively for eating meat (higher omnivorous regard), feel less motivation to follow their diets (lower prosocial, personal, and moral motivations), and have been following their diet for a shorter duration of time. Effects of these differences were large for centrality and moral motivation; medium-large for omnivorous regard and prosocial motivation; medium for private regard; and small-medium for public regard and personal motivation (based on Cohen (1988) guidelines that d of 0.2 = small, 0.5 = medium, and 0.8 = large). Furthermore, multivariate analyses revealed that, of these factors, higher dietary identity centrality and higher moral motivation most strongly predicted that an individual would report following a vegetarian over a flexitarian diet. Interestingly, contrary to our hypotheses, having fewer vegetarians in one's local community predicted following a vegetarian over a flexitarian diet, and the prevalence of vegetarians in one's social network of friends and family provided no predictive value. Regarding our study's second aim, we found that higher dietary identity private regard, higher prosocial motivation, higher personal motivation, and status as a woman predicted greater openness to going vegetarian among flexitarians.

Taken together, these findings suggest that limiting one's meat intake partially has distinct implications for social identity, dietary motivation, and moral judgment than does limiting one's meat intake entirely: Compared to vegetarians, flexitarians view their diets as a less

pervasive component of their self-concept (given our findings for centrality, private and public regards, and duration) and hold weaker convictions in support of avoiding meat, particularly in the domain of morality (given our findings for omnivorous regard and dietary motivations).

Our data not only support prior findings that vegetarians are more ethically (i.e., prosocially and morally) motivated than flexitarians are (De Backer & Hudders, 2014, 2015) but also provide insights into optimal research methodology. Namely, the finding that vegetarians scored higher than flexitarians did on prosocial, personal, and moral motivation highlights the importance of considering dietary motivation as both a categorical and continuous variable. When nominating whether their primary dietary motive relates to ethics or health, we imagine—based on prior findings (e.g., Rothgerber, 2014a)—that vegetarians would be more likely to nominate ethics, whereas flexitarians would be more likely to nominate health. This pattern may readily be taken to suggest that vegetarians have higher ethical motivation but that flexitarians have higher health motivation. Our findings, however, caution against this inference. Rather, our data suggest that vegetarians have higher levels of not only prosocial and moral, but also personal, motivations than flexitarians do. Dietary motivations, we emphasize, are not mutually exclusive.

Vegetarians' higher levels of centrality and private regard and lower level of public regard, relative to flexitarians, demonstrate differences in social identity formation between people who forgo meat entirely and those who curtail their meat intake partially. The effects of deviating more from social norms, we speculate, may explain why vegetarians feel as if their diets define who they are to a greater extent, in line with theorizing by Joy (2009). Yet we also consider the possibility that meat-avoiders with a higher centrality may be more inclined to go vegetarian, presumably as a means of achieving greater self-consistency (e.g., Festinger, 1957; Lecky, 1945). Given that centrality did not uniquely predict how open flexitarians were to going vegetarian, we propose that a more probable account of this link is our first line of theorizing—that following a vegetarian diet causes people to develop higher centrality than following a flexitarian diet does. Future research employing longitudinal and experimental designs can provide critical evidence to either support or refute this perspective.

Vegetarians' having lower public regard than flexitarians that members of marginalized dietary groups who identify strongly with that group membership are at elevated risk for feeling stigmatized and for feeling as if other people judge them unfavorably. Prior research has documented stigma surrounding vegetarianism (e.g., Kellman, 2000; Markowski & Roxburgh, 2018; Minson & Monin, 2012), but it remains unclear the extent to which flexitarianism is stigmatized. Our results suggest that it is less so. Vegetarians' developing higher levels of private regard than flexitarians, we speculate, may enable them to maintain a positive self-image in the face of experiencing low public regard and feelings of stigma. This speculation aligns with social identity research beyond the food domain (e.g., Chavous et al., 2003; Hewstone et al., 2002; Stevenson & Arrington, 2009).

To the second aim of our research, we found that higher dietarian identity private regard, higher prosocial motivation, higher personal motivation, and status as a woman predicted greater openness to going vegetarian among flexitarians. Several points on these findings on openness are worthy of consideration. For one, higher levels of both prosocial and personal motivation predicted greater openness to going vegetarian. The current research—complementing prior work on differences in ethical and health motivations among meat-avoiders (De Backer & Hudders, 2014, 2015)—reports that although vegetarians are more strongly motivated to follow their diets for prosocial, personal, and moral reasons than flexitarians are, differences in prosocial and moral motivations between flexitarians and vegetarians are substantially more pronounced than are between-group differences in personal motivation. The decision to go fully vegetarian rather than flexitarian, thus, may reflect an individual's views about ethics,

morality, and altruism more strongly than it reflects his or her personal health goals. At the same time, our multivariate analyses suggest that greater levels of both prosocial and personal motivation uniquely predict greater openness to going vegetarian. Accordingly, although experimental evidence is needed to demonstrate causality, these data preliminarily suggest that interventions may successfully motivate people to go vegetarian by targeting either ethical (e.g., animal or environmental) or health concerns related to eating meat—with the largest effects likely to come from targeting both concerns together.

An additional insight gained from these findings is that gender uniquely predicted how open flexitarians were to going vegetarian, over and above how frequently they eat meat, how they express social identity related to meat avoidance, and what motivations they have for avoiding meat. Identifying this effect enhances our understanding of recurrent findings that the majority of vegetarians are women and that women are more open to reducing their meat intake than men are (Cramer et al., 2017; Forestell & Nezelek, 2018; Hayley, Zinkiewicz, & Hardiman, 2015; Pfeiler & Egloff, 2018; Pohjolainen, Vinnari, & Jokinen, 2015). Specifically, the current research provides novel evidence to suggest that, even among people who have already curtailed their meat intake, women are more open to the idea of going vegetarian—and that this effect can be uniquely attributed to gender, rather than most proximally to identity, motivational, or social-contextual aspects of dieting.

Finally, an intriguing finding from our data with direct relevance for applying social identity theory (Tajfel & Turner, 1985) to eating behavior is that higher private regard predicted greater openness to going vegetarian among flexitarians, over and above all other factors tested. In fact, private regard was the strongest predictor of openness. Principally, we derive from this finding support for the idea that flexitarians who take pride in being meat-avoiders want to go “all the way” and become a part of the vegetarian (or vegan) social category, which embodies the purest form of meat avoidance. Perspectives on identity theory (e.g., Gelman & Heyman, 1999; Stryker & Serpe, 1982) suggest that taking on a vegetarian identity may boost self-esteem among flexitarians and make meat avoidance more central to who they are, in line with recent theorizing that social identity motivation may be a unique dietary motivation behind vegetarianism for some individuals (Plante et al., 2019). Prospects of changing one's diet, thus, may reflect prospective changes in one's dietary *identity* beyond just one's dietary *behavior*.

4.1. Strengths and limitations

Two strengths of the current research are its use of preregistration and its highly powered design. Another strength is that empirically considering social identity factors related to people's dietary intentions—beyond behavioral factors such as food consumption frequency or dietary duration—is novel. Further interesting to note is that behavioral factors of meat avoidance did not predict how open flexitarians were to going vegetarian. Thus, our findings can inspire psychosocially centered approaches to studying dietary behavior change.

A first and foremost limitation of this research is its cross-sectional nature, as we identified factors that predict people's current diets and self-reported future dietary intentions but we did not track longitudinally or experimentally how these factors correspond to subsequent changes in actual eating behavior or dietary intention. A second limitation, relevant to interpreting group differences in dietarian identity between vegetarians and flexitarians, is the potential for confounding factors, as the aim of our analyses reported in Table 3 was more broadly to test for bivariate links. For example, there may be generational (e.g., Millennials versus Baby Boomers), ideological (e.g., political orientation), or personality factors, and so forth, that covary with vegetarian versus flexitarian tendencies. A third limitation is that because our measure of dietary group membership operationalized vegetarian status as being one who does not eat meat, our study did not

allow us to distinguish between vegans and non-vegan vegetarians. Given that vegans and non-vegan vegetarians exhibit some psychological differences (Rothgerber, 2017), categorizing these two subgroups distinctly may be of interest to future research. A fourth limitation is that our findings may only be generalizable to individuals in the U.S. Thus, cross-cultural studies of dietarian identity among vegetarians and flexitarians would be valuable.

5. Conclusion

Identifying how people construe the decision to forgo meat altogether differently from the decision to reduce their meat intake partially offers insights into improving public health and reducing the environmental impact of agriculture. Beyond dietary motivation, the expression of social identity emerged in our research as a key factor that not only distinguishes vegetarians from flexitarians but also predicts how open flexitarians are to giving up meat entirely. Psychological research, accordingly, is essential to identifying strategies for promoting meat reduction without sacrificing individuals' senses of identity. As food systems and eating behaviors evolve, it can be valuable to investigate how individuals engage with and express nuanced forms of flexitarian identity—whether they identify as eating a plant-based, plant-forward, or plant-powered diet; as a part-time vegetarian; as a semi-vegetarian; or even explicitly as a flexitarian. By demonstrating that vegetarianism and flexitarianism have largely distinct psychological correlates, we provide an initial step toward illuminating how people select and maintain these gradients of meat-reduced diets.

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CRediT authorship contribution statement

Daniel L. Rosenfeld: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Hank Rothgerber:** Writing - original draft, Writing - review & editing. **A. Janet Tomiyama:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2020.103963>.

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