



Development and validation of the Dietarian Identity Questionnaire: Assessing self-perceptions of animal-product consumption

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ABSTRACT

In navigating decisions about what to eat, people both construct and rely on a food-choice identity. Yet food choice is multifaceted, as people apply different dietary schemas to different types of food, engaging various domains of food-choice identity. In this paper, we focus on *dietarian identity*: one's thoughts, feelings, and behaviors with respect to consuming or eschewing animal products (here, pertaining to red meat, poultry, fish, eggs, and dairy). First, we draw upon Rosenfeld and Burrow's (2017a) Unified Model of Vegetarian Identity in order to develop a Dietarian Identity Questionnaire (DIQ). Second, we validate the DIQ's factor structure, construct validity, internal consistency, test-retest reliability, and replicability. Lastly, we highlight directions for the use of the DIQ in future research.

1. Introduction

As Sobal, Bisogni, and Jastran (2014) proclaim in a recent review, food choice is “multifaceted, contextual, dynamic, multilevel, integrated, and diverse” (p. 6). Concurrently influenced by sociocultural conditions, interpersonal situations, and personal preferences, people draw upon interactive biological and psychological drives in making decisions about what to eat. In navigating these decisions, people both construct and rely on a food-choice identity—one that shapes how they think, feel, and behave with respect to eating (Bisogni, Connors, Devine, & Sobal, 2002; Sobal et al., 2014). Within the food-choice literature, animal-product consumption presents a notable domain that has garnered significant attention in work on not only ethics (e.g., Colb, 2013), health (e.g., Greger & Stone, 2016), and the environment (e.g., Baroni, Cenci, Tettamanti, & Berati, 2007) but also identity (e.g., Cherry, 2015; Fox & Ward, 2008b; Romo & Donovan-Kicken, 2012; Sneijder & Te Molder, 2009). Much of this work, more precisely, has focused on people who refrain from eating meat and the vegetarian identity they derive from that dietary abstention (Rosenfeld & Burrow, 2017a; Ruby, 2012). Needed for more rigorous investigation, however, are valid and reliable measures that empirically assess the specific ways in which people construct and maintain their vegetarian identities.

To conceptualize vegetarian social identification systematically, Rosenfeld and Burrow (2017a) propose the Unified Model of Vegetarian Identity (UMVI): a multidimensional framework that captures one's thoughts, feelings, and behaviors regarding being a vegetarian. The UMVI posits that ten distinct dimensions collectively comprise a

vegetarian identity, depicting the intricate self-perceptions people hold regarding their exclusion of animal products. Central to the UMVI are the nuances often overshadowed by conventional definitions of vegetarianism—the less salient ways in which people reflect upon who they are as eaters. A single item probing one's dietary pattern or label can readily yield two broad categories of vegetarians and omnivores. Accordingly, an investigator might determine identity status based on people's responses to questions such as “Do you eat meat?” or “Are you a vegetarian?” At the same time, however, such methodology far oversimplifies how people internalize their dietary behaviors within their dynamically evolving lifespan and social contexts.

Rosenfeld and Burrow (2017a, 2017b) maintain that one's vegetarian identity extends beyond patterns of food choice or explicit means of self-identifying; rather, common criteria for acquiring “vegetarian” status originate from socially constructed and contextually sensitive norms. Such reasoning suggests that a fluid spectrum of omnivorous food choices—rather than a binary decision of whether or not to eat meat—underlies processes of social categorization and identification. The influence of historical embeddedness and documented discrepancies between dietary pattern and label elucidate this phenomenon (Rosenfeld & Burrow, 2017a). Across cultures, nuanced forms of meat avoidance carry vastly different meanings (Kittler, Sucher, & Nelms, 2012), making it unsurprising that the moral foundations of Euro-American and Indian vegetarians contrast those of their omnivorous counterparts to varying extents (Ruby, Heine, Kamble, Cheng, & Waddar, 2013). Within the same culture, people define vegetarianism in divergent ways (Ruby, 2012) and adhere to vegetarian diets with

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varying degrees of strictness (Rosenfeld & Burrow, 2017a), such that many people self-identify as vegetarian without actually following a vegetarian diet strictly (Dietz, Frisch, Kalof, Stern, & Guagnano, 1995; Rothgerber, 2014a; Stiles, 1998). Moreover, survey results on self-identified vegetarians' food choices suggest that ambiguities exist in the extents to which people consider poultry and fish within the same “meat” category as they place red meat (Bedford & Barr, 2005; National Institute of Nutrition, 1997). A dietary pattern one culture or individual deems to be vegetarian, another culture or individual may not.

Discrepant methods for classifying people as vegetarian, vegan, or both further convolute catchall inclusion criteria for research on vegetarian identity. While some studies (e.g., Fox & Ward, 2008a; Hoffman, Stallings, Bessinger, & Brooks, 2013) have used “vegetarianism” to include veganism, other studies (e.g., Greenebaum, 2012) have used “vegetarianism” and “veganism” as mutually exclusive terms, thus approaching the two as distinct categories. Though it sometimes merits a distinct categorical label, veganism is conventionally thought of as a subset of vegetarianism rather than as an entirely separate practice in its own (Beardsworth & Keil, 1992; Rosenfeld & Burrow, 2017a; Ruby, 2012). Terminological discrepancies can nevertheless obfuscate methods of participant recruitment and threaten the validity and generalizability of empirical findings. Investigators studying any category of people who follow a plant-based diet, eschew animal products, self-identify as vegetarian or vegan, or engage with other forms of food-choice identity in this domain face obstacles in defining sample parameters.

A growing interest in studying animal-product consumption and avoidance behaviors highlights the need for a psychometrically grounded way of assessing relevant constructs. Rosenfeld and Burrow's (2017a) UMVI outlines distinct and measurable facets of a vegetarian identity, yet no instrument exists to capture these constructs. In this research, we aimed to develop and validate an instrument to reflect the UMVI framework soundly while also addressing the aforementioned sensitivities surrounding animal-product consumption behaviors. Such an instrument should not simply capture whether people self-categorize as *vegetarian* or not, as this term is reductionist and represents a socially constructed label assigned to or adopted by people who satisfy some culturally variable dietary criteria. Rather, an appropriate instrument for operationalizing the UMVI should depict how people think, feel, and behave with respect to following their dietary pattern—the combination of animal products (i.e., red meat, poultry, fish, eggs, and dairy) they generally include in or exclude from their diet (Rosenfeld & Burrow, 2017a). To these points and for practical measurement purposes, we call the overarching construct that depicts this self-perception *dietarian identity*. In doing so, we seek to reflect a diverse spectrum of dieters more appropriately in line with UMVI theorizing, capturing the multidimensional self-images people cultivate with respect to their dietary pattern, regardless of their concrete food choices or self-ascribed label. Ultimately, in any form it may take, each individual's *dietarian identity* characterizes his or her response to the question, “Who am I when it comes to consuming or eschewing animal products?”

2. Clarifying *dietarian identity*

As Rosenfeld and Burrow (2017a) suggest, dietary pattern constitutes the core of *dietarian identity* off of which all other dimensions work. Dietary pattern in this domain refers to the combination of animal products—red meat, poultry, fish, eggs, and dairy¹—one includes in or excludes from one's diet, given a sufficient perception of control

¹ Throughout this paper, “animal products,” unless otherwise specified, refers to these five products: red meat, poultry, fish, eggs, and dairy. Which species and body parts of animals are considered normative to consume varies by culture and over time. Only these five animal products are considered within our measurement of *dietarian identity*.

over one's food choices. Such a feeling of control is essential to this conceptual definition, as people with who deviate from their typical dietary pattern occasionally nevertheless set out to follow a particular dietary restriction. Many self-identified vegetarians, for instance, eat meat from time to time, despite their dietary pattern being one that excludes meat (Barr & Chapman, 2002; Dietz et al., 1995; Stiles, 1998; White, Seymour, & Frank 1999). Accordingly, capturing dietary pattern is not a matter of inquiring about which animal products people “never” eat or how often they eat them; rather, dietary pattern concerns a mindset—a general effort to refrain from consuming selected foods, and one that is realized under ideal circumstances.

While many people readily eat any animal product (i.e., red meat, poultry, fish, eggs, and dairy) and thus follow an unrestricted dietary pattern, other people follow various types of restricted diets, which can generally be characterized along a spectrum of animal-product exclusion (Beardsworth & Keil, 1992; Gill, 2015; Ruby, 2012). Though this spectrum is often divided into binary vegetarian and vegan categories (Rothgerber, 2013, 2014b; Ruby, 2012; Thomas, 2016), it further encompasses even more nuanced dietary pattern distinctions, such as lacto vegetarian, ovo vegetarian, lacto-ovo vegetarian, pollotarian, and pescatarian (see Gill, 2015). One can accordingly designate specific terms, such as “vegan identity” or “pescatarian identity,” to capture the identities people construct around particular patterns of food choice. Such terms, however, conflate social category membership with identity construction. Fundamentally, these terms fail to capture the overarching identity that houses these nuances, unsuitably partitioning a coherent construct into fragmented parts.

Our proposed method for assessing *dietarian identity* builds directly on Rosenfeld and Burrow's (2017a) conceptualization of vegetarian identity yet emphasizes a slightly divergent way of operationalizing variables. Whereas *vegetarian identity* refers to an individual's thoughts, feelings, and behaviors regarding being a vegetarian (Rosenfeld & Burrow, 2017a), *dietarian identity* more broadly refers to an individual's thoughts, feelings, and behaviors regarding consuming or eschewing animal products. Thus, *dietarian identity* serves as an umbrella construct that encompasses all self-perceptions in this domain, capturing people's engagements with a realm of food choice (i.e., animal-product consumption) rather than their social identifications with various categories (e.g., vegetarian, vegan). *Dietarian* is not a label to be assigned to some category of people; rather it is a construct that captures aspects of the food choices people face.

Dietarian identity involves components of both a personal and social identity. Because there exists a finite number of dietary pattern combinations one can follow, people will come to associate themselves with similar types of dieters. In centering on one's own dietary pattern (i.e., a personal decision), *dietarian identity* inevitably considers similarities and distinctions with other people's dietary patterns (i.e., ways in which that personal decision implicates social identification). As such, assessing *dietarian identity* entails measuring a personal identity that yields social identity corollaries.

Operationalizing Rosenfeld and Burrow's (2017a) conceptualization of vegetarian identity through a *dietarian identity* framework is pivotal to reflecting the self-perceptions of people who exclude certain animal products in ways that deviate from traditional vegetarian dieting. Conventionally, as related to the dietary pattern dimension of *dietarian identity*, people seeking to follow a vegetarian diet increase their dietary-pattern restrictiveness by excluding these animal products in the following order: red meat, poultry, fish, eggs, and dairy (Beardsworth & Keil, 1992). Many people, however, likely deviate from this trend. Consider one individual who eats all forms of meat yet refrains from eating eggs and dairy because she sees an ethical problem with those industries' practices; another individual who excludes only fish from his dietary pattern because he has a seafood allergy; or a third individual who eats all animal products except eggs in order to reduce his cholesterol intake. Though these individuals lack any engagement with vegetarianism, their self-perceptions as animal-product excluders

nevertheless can be situated appropriately within a UMVI framework. These individuals follow specific dietary patterns within social contexts, internalize these dietary patterns into their self-concepts, and externalize these dietary patterns through their actual food choices and in social situations. Paradigms from vegetarianism, however, fail to reflect any of these individuals' experiences. Clarifying terminological nuances can bolster investigators' abilities to operationalize constructs soundly and to interpret results appropriately.²

We conceive dietarian identity as relevant to any type of dieter. Neither a label nor a dietary pattern suffices to illuminate the profile of one's identity. Knowing whether an individual is a vegetarian or an omnivore does not reveal the full scope of what food choice means to him or her—such as the ideological significance of following some diet, the personal importance of that food choice, or the extent to which one feels stigmatized for eating that way. Investigators often stratify individuals by label, as we do to compare dietarian identity between vegetarians and omnivores later on in this paper (see Table 8). Yet we also see benefit in stratifying individuals by identity constructs. Labels may be outcomes of interest (e.g., De Backer & Hudders, 2014), or even separate from questions at hand. With our framework of dietarian identity, investigators can compare various types of people for whom dietary pattern is highly central to identity, for example, regardless of identity status (e.g., whether someone is a vegetarian or omnivore). It would behoove future research to examine both within-group and between-group differences.

3. The current research: measuring dietarian identity

In this paper, we aimed to develop and validate a measure for assessing dietarian identity through Rosenfeld and Burrow's (2017a) UMVI framework. The UMVI outlines ten distinct dietarian identity dimensions organized into three conceptual levels: contextual, internalized, and externalized. At the contextual level are the dimensions of historical embeddedness, timing, and duration, which collectively capture the contexts underlying dietarian identity. Historical embeddedness refers to historical and sociocultural conditions, such as characteristics of one's time period and geographical location. Timing refers to the progression of one's engagement with animal-product consumption over the course of one's lifespan. Duration refers to the amount of time for which one has sustained an engagement with one's level of animal-product consumption—for example, how long one has self-identified as vegetarian or vegan, followed one's current dietary pattern of excluding dairy, followed an unrestricted dietary pattern, or so forth. Depending on the research question at hand or the idiosyncratic nature of an individual's dietarian identity, these contextualized dimensions can be operationalized in a variety of ways.

At the UMVI's internalized level are the dimensions of salience, centrality, regard, and motivation, which collectively capture the self-evaluations of dietarian identity (Rosenfeld & Burrow, 2017a). Salience and centrality pertain to how relevant animal-product consumption is to one's self-concept. Salience refers to the temporally specific extent to

which one's dietarian identity is activated in a particular context—that is, the relevance of one's engagement with animal-product consumption at a given moment. Centrality captures a temporally stable salience, per se, or the extent to which following one's dietary pattern is a predominant feature of one's overall self-concept across contexts.

With three components, regard pertains to domain-specific forms of self-esteem (i.e., private and public regards) as well as one's out-group evaluation (i.e., out-group regard), in terms of positive-negative valences. Private regard refers to one's personal feelings toward following one's dietary pattern and toward other people who also eat this way, whereas public regard constitutes an internalized out-group lens, referring to one's feelings about how dietary out-group members and the larger society evaluate those who follow one's dietary pattern. Omnivorous regard, in a different sense from private or public regard, refers to one's evaluation of the use of animal products that one's own dietary pattern excludes. Creating a practical measure for omnivorous regard, however, necessitates expanding this conceptualization to apply to all types of dieters beyond just people who eschew animal products.

At its core, omnivorous regard captures an out-group evaluation. Within the UMVI, out-group dieters were by default omnivores, as the in-group was comprised of vegetarians. This construct that Rosenfeld and Burrow (2017a) titled *omnivorous regard* represents not one's attitudes toward omnivores, per se, but rather one's attitudes toward out-group dieters—that is, people who follow a diet that differs from one's own. As such, within dietarian identity, we rename *omnivorous regard* as *out-group regard*, which can be defined as one's evaluation of people who follow a dietary pattern that differs from one's own. All individuals, regardless of their dietary patterns, can think about people who eat a way differently than they do. A vegetarian with a low level of out-group regard, for example, evaluates people negatively for eating meat and may experience aversive emotions such as disgust, anger, contempt, or resentment from seeing someone eat meat (Rosenfeld & Burrow, 2017a). For omnivores, meanwhile, out-group regard captures attitudes toward people who do not practice omnivorous dieting, such that an omnivore with low out-group regard may evaluate vegetarians unfavorably for not eating meat. Anyone who does not follow one's own specific dietary pattern is considered part of the out-group. For pescatarians, out-group regard captures attitudes toward people who do not follow a pescatarian diet, whereas for vegans, it captures attitudes toward non-vegans (which includes vegetarians), and so forth.

Encompassing three orientations, the motivation dimension captures the goals underlying one's engagement with animal-product consumption—why one follows one's dietary pattern and what types of outcomes one aims to achieve by eating this way (Rosenfeld & Burrow, 2017a, 2017b). In essence, motivation embodies the personally construed significance of animal-based food choices. According to the UMVI, three motivational orientations exist in this domain: prosocial, personal, and moral motivations. Prosocial motivation captures one's aims to impact something beyond oneself, whereas personal motivation captures one's self-focused goals. Moral motivation refers to how one's beliefs about rightness and wrongness relate to following one's dietary pattern. For an extensive review of these motivations, see Rosenfeld and Burrow (2017b).

Lastly, at the UMVI's externalized level are the dimensions of dietary pattern, strictness, and label, which collectively capture the behavioral enactments of dietarian identity. One's dietary pattern characterizes which animal products one generally consumes or eschews, given a sufficient feeling of control over one's food choices. Strictness refers to how stringently one adheres to one's dietary pattern. One's label—i.e., vegetarian, vegan, pescatarian, semi-vegetarian, flexitarian, reductarian, omnivore, etc.—is how one self-identifies, with respect to his or her dietary pattern.

Four of these ten dimensions—centrality, regard, motivation, and strictness—must be operationalized with continuous multi-item Likert-type scales, while all of the other six dimensions—except for salience—can be assessed via single-item, categorical, open-ended, or

² Scales utilized in research on racial and ethnic identity can elucidate this terminological distinction further. While some racial and ethnic identity scales assess how people identify with specific racial categories, such as Black racial identity (e.g., Helms, 1990; Sellers, Rowley, Chavous, Shelton, & Smith, 1997; Vandiver, Cross, Worrell, & Phagen-Smith, 2002) and White racial identity (e.g., Helms & Carter, 1990), other scales assess how people from any category reflect on their ethnicity in general (e.g., Phinney, 1992). A similar relationship exists between vegetarian identity and dietarian identity. Vegetarian identity centers on the intricacies by which people identify as vegetarian and perceive that group membership to be a defining self-attribute. Dietarian identity, more holistically, centers on following a certain dietary pattern and perceiving that dietary pattern as a part of how one sees oneself. Just as Phinney (1992) devised a method for assessing a universal domain of ethnic self-perception suitable for people who identify with different ethnic groups, we seek to propose a novel paradigm for considering a shared domain of dietarian self-perception across people who identify with any animal-product consumption dietary group.

dichotomous responses (Rosenfeld & Burrow, 2017a). Salience, unlike any other dimension, can be either evaluated via ecological momentary assessment techniques or primed through experimental techniques that activate one's dietician identity (Rosenfeld & Burrow, 2017a).

In other social identity domains, such as race and gender, investigators have devised useful scales for assessing related constructs of centrality and regard (e.g., Luhtanen & Crocker, 1992; Sellers et al., 1997; Settles, 2004). Scales also exist to characterize various self-perceptions with respect to food choice (e.g., Arbit, Ruby, & Rozin, 2017; Lindeman & Väänänen, 2000; Steptoe, Pollard, & Wardle, 1995). Integrating perspectives from these bodies of literature with the UMVI's conceptual framework, the current set of studies aimed to create a sound instrument for measuring dietician identity.

Here, we sought to develop and validate scales for quantifying the dietician identity dimensions of centrality, regard, motivation, and strictness. As regard and motivation each includes three subscales, we examined a total of eight subscales. Together, the final versions of these eight subscales form the Dietician Identity Questionnaire (DIQ). After reviewing three studies in which we investigated the factor structure, construct validity, internal consistency, test-retest reliability, and replicability of the DIQ, we explain in greater detail specific methods for operationalizing the other six dietician identity dimensions—historical embeddedness, timing, duration, salience, dietary pattern, and label—for which multi-item scales are unsuitable.

4. Overview of study methods

Drawing upon the UMVI's conceptual definitions and theoretical underpinnings as well as existing scales that assess social identity and food choice, we generated a preliminary set of 95 items for the DIQ. After sending this version of the DIQ to 18 researchers who have contributed scholarship to fields of identity and food choice to assess the face validity of our items, we used critical feedback to enhance the DIQ's validity by rewording certain items and dropping 43 other items, subsequently retaining 52 items for empirical investigation (see Table 1 for items; also see “Materials” section below for dietary pattern operationalization to which items refer).

We collected data by administering online surveys to three samples. Participants in all samples were at least 18 years of age, from the United States, and completed the same identical survey. Participants in Studies 1 and 2 were recruited via Amazon Mechanical Turk (MTurk) and received \$1.00 for taking our survey. In Study 1, we conducted an exploratory factor analysis (EFA) in order to examine the factor structure of our initial 52-item DIQ and to drop poorly performing items. In Study 2, we conducted a confirmatory factor analysis (CFA) on a revised 33-item version of the DIQ. We then examined the DIQ's internal consistency, factor intercorrelations, and construct validity. Participants in Study 3 were undergraduate students recruited from a large university in the northeastern United States who received course extra credit for taking our survey. With this sample, we conducted another CFA in order to assess the DIQ's fit on a sample whose participant demographics differ from those obtained via MTurk. A proportion of participants in this sample were assessed twice—at baseline and with a follow-up survey approximately two weeks later—in order to evaluate the test-retest reliability of the DIQ. We also compared dietician identity profiles between vegetarians and omnivores in this sample. In all three studies, participants who completed the survey in fewer than 2 min or failed an attention check were excluded from our analyses. In Study 1, for reference, participants completed the survey in an average of 14.81 min. Data and analysis scripts for all three studies are available via the Open Science Framework at <https://osf.io/2agwb/>.

4.1. Materials

4.1.1. Dietary pattern

Dietician dietary pattern was assessed with a single-item, based off

Table 1
Initial DIQ Items. All items were measured via Likert-type scales of 1 (Strongly Disagree) to 7 (Strongly Agree). “(R)” indicates a reverse-scored item.

Centrality
1.
Following my dietary pattern is an important part of who I am.
2.
My dietary pattern has a big impact on how I think of myself.
3.
My dietary pattern is an important part of how I would describe myself.
4.
My dietary pattern defines a significant aspect of who I am.
5.
A big part of my lifestyle revolves around my dietary pattern.
6.
I feel a strong connection with other people who also follow my dietary pattern.
Private regard
7.
Following my dietary pattern improves my life.
8.
People who follow my dietary pattern tend to be good people.
9.
I feel positively about following my dietary pattern.
10.
People who follow my dietary pattern should take pride in their food choices.
11.
Following my dietary pattern is a respectable way of living.
Public regard
12.
People who follow my dietary pattern are judged negatively for their food choices. (R)
13.
People who follow my dietary pattern tend to receive criticism for their food choices. (R)
14.
Following my dietary pattern is associated with negative stereotypes. (R)
15.
People who follow my dietary pattern are typically viewed as good people.
16.
People who follow my dietary pattern are well respected in society.
17.
In general, people who follow my dietary pattern are considered to be a burden to society. (R)
18.
The media portrays people who follow my dietary pattern favorably.
Out-group regard
19.
It bothers me when people eat foods that go against my dietary pattern. (R)
20.
I judge people negatively for eating foods that go against my dietary pattern. (R)
21.
I view people as less moral for eating foods that go against my dietary pattern. (R)
22.
If I see someone eat foods that go against my dietary pattern, I like him or her less. (R)
23.
Seeing people eat foods that go against my dietary pattern makes me upset or angry. (R)
24.
Seeing someone eat foods that go against my dietary pattern makes him or her less attractive to me. (R)
25.
Ideally, I would not want to be romantically involved with someone who eats foods that go against my dietary pattern. (R)
26.
It would be hard for me to be close friends with someone who eats foods that go against my dietary pattern. (R)
27.
People should feel guilty about eating foods that go against my dietary pattern. (R)
Prosocial motivation
28.
I follow my dietary pattern because I want to benefit society.
29.
I am motivated to follow my dietary pattern because I want to help others.
30.
I follow my dietary pattern because eating this way is good for the world.
31.
My reasons for following my dietary pattern include matters beyond myself.

(continued on next page)

Table 1 (continued)

32.
I view my dietary pattern as a way of making the world a better place for others.
33.
I feel motivated to follow my dietary pattern because I am concerned about the effects of my food choices on other beings.
34.
When thinking about which animal products to consume, I consider the effects of my food choices on the world.
35.
Concerns about social issues motivate me to follow my dietary pattern.
Personal motivation
36.
I follow my dietary pattern because eating this way improves my life.
37.
I follow my dietary pattern because I am concerned about the effects of my food choices on my own well-being.
38.
I follow my dietary pattern because I want to feel good about myself.
39.
For me, following my dietary pattern is a way of achieving personal growth.
40.
When thinking about which animal products to consume, I consider the effects of my food choices on my own health.
Moral motivation
41.
I follow my dietary pattern because eating this way is the morally right thing to do.
42.
I feel that I have a moral obligation to follow my dietary pattern.
43.
I am motivated to follow my dietary pattern because eating foods that go against my dietary pattern is immoral.
44.
I would feel morally guilty if I were to eat foods that go against my dietary pattern.
45.
A desire to make moral food choices motivates me to follow my dietary pattern.
Strictness
46.
I always follow my dietary pattern strictly.
47.
In certain situations, I eat foods that go against my dietary pattern. (R)
48.
When eating at a restaurant or social gathering, I always check carefully to make sure that the food I eat meets the standards of my dietary pattern.
49.
I can be flexible and sometimes eat foods that go against my dietary pattern. (R)
50.
I will never eat foods that go against my dietary pattern.
51.
From time to time, I eat foods that go against my dietary pattern. (R)
52.
I would eat a food product that goes against my dietary pattern if I were to hear that it tastes exceptionally good. (R)

of Rosenfeld and Burrow's (2017a) recommendation. This item read, "In general, which of the following food groups do you **not** eat? Please select all that apply. If you generally eat all of these food groups, please select the last response." Below this item was a list of six responses. Responses one through five read, "I generally do not eat red meat," "I generally do not eat poultry," "I generally do not eat fish," "I generally do not eat dairy," and "I generally do not eat egg," respectively. Response six read, "I generally eat all of these food groups." Participants who did not select response six were able to select multiple responses. Below this item was a prompt that read, "For the rest of this survey, please note that your "dietary pattern" represents those foods you indicated above. For example, if you selected "red meat" and "dairy," your dietary pattern excludes red meat and dairy. If you selected the last response, your dietary pattern includes all of these foods."

4.1.2. Initial DIQ items

We included a set of 52 items that were designed to assess the DIQ's eight hypothesized constructs of centrality; private, public, and out-group regards; prosocial, personal, and moral motivations; and

strictness (see Table 1 for all initial items). Instructions for these items read, "Please indicate how strongly you agree or disagree with each of the following statements." Responses to all items ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

4.1.3. Perceived dietary restrictiveness

We included a set of six items to assess the extent to which participants perceive following their dietary pattern as socially restrictive ($\alpha = 0.80$). Two example items were "I often find it socially difficult to follow my dietary pattern" and "Following my dietary pattern has negatively affected my social relationships," to which responses ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

4.1.4. Moral meaning of food in life

Moral meaning of food in life was assessed with Arbit and colleagues' (2017) 5-item Meaning of Food in Life Questionnaire (MFLQ) moral subscale ($\alpha = 0.92$). An example item on this scale was "I care about the impact of my food choices on the world," to which responses ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).

4.1.5. Food-choice health motive

Food-choice health motive was assessed with Steptoe and colleagues' (1995) Food Choice Questionnaire (FCQ) health subscale ($\alpha = 0.91$). This measure began with the statement, "It is important to me that the food I eat on a typical day," and followed with six items, including "Is nutritious" and "Is high in fiber and roughage," to which responses ranged from 1 (Not at all important) to 4 (Very important).

4.1.6. Ecological welfare

Ecological welfare concern was assessed with Lindeman and Väänänen's (2000) ecological welfare scale ($\alpha = 0.92$). This measure began with the statement, "It is important to me that the food I eat on a typical day," and followed with five items, including "Has been produced in a way that animals have not experienced pain" and "Has been prepared in an environmentally friendly way," to which responses ranged from 1 (Not at all important) to 4 (Very important).

4.1.7. Personality

The Big Five factors of personality—including extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience—were assessed with Donnellan, Oswald, Baird, and Lucas' (2006) Mini-IPIP scales. Each factor's subscale included four items. An example item for extraversion ($\alpha = .86$) included "I am the life of the party." An example item for agreeableness ($\alpha = 0.76$) included "I sympathize with others' feelings." An example item for conscientiousness ($\alpha = 0.67$) included "I get chores done right away." An example item for neuroticism ($\alpha = 0.78$) included "I get upset easily." An example item for openness ($\alpha = 0.81$) included "I have a vivid imagination." Responses to all items ranged from 1 (Very Inaccurate) to 5 (Very Accurate).

4.2. Procedure

After consenting to take part in this research, participants first indicated their dietary pattern and then completed all initial DIQ items. Participants completed the eight DIQ subscales in a randomized order. Then, participants completed the perceived dietary restrictiveness scale. Next, participants completed the moral meaning of food in life, food-choice health motive, ecological welfare, and personality measures in a randomized order. Lastly, participants indicated if they were vegetarian and/or vegan and completed demographic questions.

Table 2

Exploratory Factor Analysis (Study 1). Loadings for each item's theorized factor are displayed in bold. Items with an asterisk (*) were retained for confirmatory analysis in Study 2. Items without an asterisk were dropped. "(R)" indicates a reverse-scored item.

Items (arranged by theorized construct)	Factor Loadings							
	1	2	3	4	5	6	7	8
<i>Prosocial motivation</i>								
I view my dietary pattern as a way of making the world a better place for others.*	.93	-.06	-.05	-.03	.06	.05	.00	.00
Concerns about social issues motivate me to follow my dietary pattern.*	.93	.02	.00	.01	.00	.04	-.02	-.03
I follow my dietary pattern because I want to benefit society.*	.92	.01	.02	-.01	.03	-.04	-.03	.00
I feel motivated to follow my dietary pattern because I am concerned about the effects of my food choices on other beings.*	.91	-.02	-.05	.07	.01	.06	-.04	-.07
I am motivated to follow my dietary pattern because I want to help others.*	.88	.02	.05	-.06	.04	-.06	.02	.08
When thinking about which animal products to consume, I consider the effects of my food choices on the world.	.84	.01	-.03	.10	-.02	.02	-.05	-.13
I follow my dietary pattern because eating this way is good for the world.*	.83	-.02	-.04	-.02	.14	-.02	.02	.12
My reasons for following my dietary pattern include matters beyond myself.	.73	-.05	.07	.02	.00	.02	.01	.08
<i>Out-group regard</i>								
I view people as less moral for eating foods that go against my dietary pattern. (R)*	-.06	.92	.09	-.04	-.01	.03	-.01	-.02
I judge people negatively for eating foods that go against my dietary pattern. (R)*	.00	.91	-.03	.03	-.05	.04	-.03	-.05
Seeing people eat foods that go against my dietary pattern makes me upset or angry. (R)*	-.07	.91	.04	-.04	.03	.02	-.03	.06
If I see someone eat foods that go against my dietary pattern, I like him or her less. (R)*	.03	.90	-.04	.04	.01	-.01	-.01	.02
It bothers me when people eat foods that go against my dietary pattern. (R)*	-.03	.85	-.05	-.01	.00	.04	-.03	-.01
Seeing someone eat foods that go against my dietary pattern makes him or her less attractive to me. (R)*	.04	.85	.02	.04	-.04	-.02	.03	-.03
It would be hard for me to be close friends with someone who eats foods that go against my dietary pattern. (R)	.07	.84	-.06	.04	-.05	.01	-.03	.03
People should feel guilty about eating foods that go against my dietary pattern. (R)*	-.06	.82	.06	-.12	.09	-.04	.02	.00
Ideally, I would not want to be romantically involved with someone who eats foods that go against my dietary pattern. (R)	.09	.62	.03	.04	-.12	-.05	.06	-.09
<i>Centrality</i>								
My dietary pattern is an important part of how I would describe myself.*	.00	.02	.97	-.07	.06	.03	.03	-.02
My dietary pattern has a big impact on how I think of myself.*	.01	.04	.94	.02	-.05	-.07	.00	.01
A big part of my lifestyle revolves around my dietary pattern.*	-.10	-.06	.90	.10	-.02	.03	.00	-.09
My dietary pattern defines a significant aspect of who I am.*	.05	-.05	.89	-.06	.02	-.03	.04	.05
Following my dietary pattern is an important part of who I am.*	-.03	.09	.84	.05	.03	.04	.02	.03
I feel a strong connection with other people who also follow my dietary pattern.	.14	-.03	.62	-.05	.12	.02	-.04	.10
<i>Personal motivation</i>								
I follow my dietary pattern because I am concerned about the effects of my food choices on my own well-being.*	.01	-.01	-.01	.96	-.06	-.09	.03	-.12
I follow my dietary pattern because eating this way improves my life.*	-.01	-.03	-.11	.93	-.01	-.04	.00	.00
When thinking about which animal products to consume, I consider the effects of my food choices on my own health.*	.01	.02	.12	.81	-.06	-.09	.01	-.17
I follow my dietary pattern because I want to feel good about myself.	.04	.03	.00	.65	.14	-.10	-.03	.15
For me, following my dietary pattern is a way of achieving personal growth.	.16	.05	.11	.62	-.14	-.13	-.04	.17
<i>Private regard</i>								
People who follow my dietary pattern tend to be good people.*	.06	-.04	.07	-.16	.85	.00	-.15	-.04
Following my dietary pattern is a respectable way of living.*	.01	-.04	-.04	.24	.73	.11	-.05	-.12
People who follow my dietary pattern should take pride in their food choices.*	.02	.01	.06	.21	.67	.07	-.06	-.04
I feel positively about following my dietary pattern.	-.13	.05	.00	.42	.51	.08	-.01	.00
Following my dietary pattern improves my life.	-.05	-.05	-.02	.72	.16	.04	.04	-.04
<i>Strictness</i>								
I can be flexible and sometimes eat foods that go against my dietary pattern. (R)*	-.05	-.03	.03	-.12	-.02	.87	.03	-.01
From time to time, I eat foods that go against my dietary pattern. (R)*	.05	.06	-.03	-.10	.03	.85	-.02	-.07
I would eat a food product that goes against my dietary pattern if I were to hear that it tastes exceptionally good. (R)*	.07	.09	-.04	.04	-.12	.78	.03	.03
In certain situations, I eat foods that go against my dietary pattern. (R)	-.12	.12	-.02	-.14	.23	.64	-.07	-.06
I will never eat foods that go against my dietary pattern.	.09	-.24	.07	-.05	-.04	.61	.07	.04
When eating at a restaurant or social gathering, I always check carefully to make sure that the food I eat meets the standards of my dietary pattern.	.19	-.01	.17	.14	-.08	.33	.05	.08
I always follow my dietary pattern strictly.	-.11	.01	-.07	.33	.13	.30	-.03	.21
<i>Public regard</i>								
People who follow my dietary pattern are judged negatively for their food choices. (R)*	-.01	-.04	.03	.01	-.02	.03	.96	-.04
People who follow my dietary pattern tend to receive criticism for their food choices. (R)*	.02	-.03	.04	-.02	-.05	.00	.94	-.04
Following my dietary pattern is associated with negative stereotypes. (R)*	-.07	-.02	.01	.04	-.10	.02	.89	.04
In general, people who follow my dietary pattern are considered to be a burden to society. (R)	.06	.19	-.15	.02	.10	.09	.42	.00
The media portrays people who follow my dietary pattern favorably.	.07	-.02	.05	.00	.45	-.14	.16	.03
People who follow my dietary pattern are typically viewed as good people.	.05	.06	-.09	-.13	.62	-.10	.12	.15
People who follow my dietary pattern are well respected in society.	.06	-.02	-.02	-.16	.67	-.21	.07	.02
<i>Moral motivation</i>								
I feel that I have a moral obligation to follow my dietary pattern.*	.41	.07	.07	-.12	.04	-.05	-.03	.68
I am motivated to follow my dietary pattern because eating foods that go against my dietary pattern is immoral.*	.38	-.09	-.04	-.03	-.13	.01	.00	.65
I follow my dietary pattern because eating this way is the morally right thing to do.*	.43	.08	.04	-.05	.05	-.07	-.04	.63
A desire to make moral food choices motivates me to follow my dietary pattern.	.47	-.03	.00	.06	-.12	.01	.03	.52
I would feel morally guilty if I were to eat foods that go against my dietary pattern.	.48	-.12	-.07	.04	-.06	.07	-.01	.44
Eigenvalue	7.27	6.74	4.69	4.38	3.30	3.26	2.91	2.04
Proportion of variance explained	.14	.13	.09	.08	.06	.06	.06	.04

5. Study 1

5.1. Method

5.1.1. Participants

After excluding 14 participants who completed the survey in fewer than 2 min and/or failed an attention check, 286 participants (57% female) between the ages of 20 and 72 ($M_{\text{age}} = 37.59$, $SD = 11.29$) were retained for analyses. Of these 286 participants, 98 (34.27%) excluded one or more animal products from their diets and 24 (8.39%) self-identified as vegetarian (including vegan).

5.2. Results and discussion

We conducted an EFA using maximum likelihood factoring and promax rotation to extract eight factors from our initial set of 52 DIQ items (see Table 2 for factor loadings). In line with the UMVI framework, items intended to assess dietarian identity centrality; private, public, and out-group regards; prosocial, personal, and moral motivations; and strictness appeared to do so largely as theorized. Eigenvalues for the eight factors were all greater than 2. Together, these factors explained 67% of the variance of responses.

We used the results of this EFA to eliminate a total of 19 items. Adopting factor-analytic guidelines outlined by existing reviews (e.g., Ferguson & Cox, 1993; Matsunaga, 2010) and seeking to maintain the construct validity of our items, we decided first to exclude items that did not load onto their theorized factor at values of 0.6 or greater. With this step, we eliminated 10 items. In developing and validating this questionnaire, moreover, we sought to provide a concise way of assessing dietarian identity and thus aimed to minimize redundancy in our items. We observed that after eliminating items with theorized-factor loadings below 0.6, many of our subscales were still quite lengthy and included multiple items that were worded similarly. To address this, we eliminated nine additional items. As the majority of these nine items had theorized-factor loadings between 0.6 and 0.7, this step enabled us to enhance our questionnaire's performance further.

After refining our questionnaire, we observed a fair degree of cross-loading between the moral and prosocial motivations factors, with all initial moral items loading onto both the moral and prosocial factors at values greater than .3. However, given that each of the three retained moral items loaded onto the moral factor by at least 0.2 points higher than they loaded onto the prosocial factor, we decided to retain moral motivation as a distinct factor and to consider these three items as appropriate moral motivation items, following Ferguson and Cox's (1993) cross-loading guidelines.

In sum, exploratory factor analyses suggest that eight latent variables are present within the DIQ. Moreover, items intended to assess each of these eight constructs did so largely in line with UMVI theorizing.

6. Study 2

In Study 1, we refined our initial set of 52 items into a 33-item DIQ. In Study 2, we aimed to confirm the DIQ's factor structure and to test its subscales' internal consistencies and construct validities in an unobserved sample in order to provide evidence needed for instrument validation.

6.1. Method

6.1.1. Participants

After excluding 13 participants who completed the survey in fewer than 2 min and/or failed an attention check, 290 participants (56% female) between the ages of 19 and 72 ($M_{\text{age}} = 35.84$, $SD = 11.50$) were retained for analyses. Of these 290 participants, 114 (39.31%) excluded one or more animal products from their diets and 30 (10.34%)

self-identified as vegetarian (including vegan).

6.2. Results

6.2.1. Confirmatory factor analysis

We used confirmatory-factor-analytic guidelines outlined by existing reviews (e.g., Ferguson & Cox, 1993; Hu & Bentler, 1999; Kahn, 2006; Kenny, 2011; Matsunaga, 2010) to assess model fit. For large samples, the chi-square test alone is an unsuitable indicator of fit, as it is almost always significant (Kahn, 2006; Kenny, 2011). As such, we evaluated model fit using other commonly used indices, including CFI, RMSEA, and SRMR.

A well-fitting model should have a CFI of at least 0.95 (Hu & Bentler, 1999; Kahn, 2006; Matsunaga, 2010), RMSEA of less than 0.06 (Kahn, 2006; Matsunaga, 2010), and SRMR of less than 0.08 (Hu & Bentler, 1999; Kahn, 2006; Kenny, 2011). According to these guidelines, the revised 33-item 8-factor DIQ model revealed a good fit, $\chi^2(467) = 857.02$, $p < .001$, CFI = 0.958, RMSEA = 0.054, SRMR = 0.041. The DIQ's RMSEA was not significant ($p = .14$), suggesting furthermore that the model fit the data closely (Kenny, 2011).

6.2.2. Internal consistency

Internal consistencies were sufficiently high for all eight DIQ subscales, ranging from $\alpha = 0.85$ for private regard to $\alpha = 0.97$ for prosocial motivation (see Table 3 for all subscales' internal consistencies and descriptive statistics; see Table 4 for subscale intercorrelations).

6.2.3. Construct validity

We assessed the DIQ's construct validity in two ways. First, we examined bivariate correlations between its subscales and theoretically related variables. Convergent validities for centrality, private regard, out-group regard, and strictness were assessed via intercorrelations between DIQ variables, whereas convergent validities for public regard and all three motivational orientations involved variables external to dietarian identity. Second, we discriminated between DIQ variables and aspects of dispositional variability by examining partial correlations of the aforementioned bivariate correlations adjusted for personality (see Table 5 for bivariate correlations between DIQ variables and the Big Five factors of personality).

Identity theory suggests that in order to maintain a positive self-image, people are inclined to make identity domains they regard highly more central to their overall self-concept (Stryker & Serpe, 1982). As such, people with a higher dietarian private regard should have a higher centrality. Indeed, centrality and private regard correlated positively, $r(288) = 0.34$, $p < .001$. According to cognitive dissonance theory, people achieve self-consistency by acting in ways that align with their core self-definitions (Festinger, 1957). People with a high dietarian centrality should thus seek to follow their dietary pattern more strictly. Furthermore, people with a high sense of moral motivation would feel as if they are contradicting their own moral code should they violate their dietary pattern. A strict dietary adherence would maintain a congruency between their moral convictions and their actual behaviors, enabling them to avoid dissonance. In line with these

Table 3
DIQ subscale internal consistencies and descriptive statistics (Study 2).

Subscale	Cronbach's α	Mean (Standard Deviation)
Centrality	.94	3.51 (1.81)
Private Regard	.85	4.57 (1.38)
Public Regard	.93	4.85 (1.78)
Out-Group Regard	.95	6.37 (1.06)
Prosocial Motivation	.97	2.53 (1.74)
Personal Motivation	.87	4.35 (1.74)
Moral Motivation	.92	2.54 (1.69)
Strictness	.88	3.26 (1.79)

Table 4
Intercorrelations between DIQ subscales (Study 2).

	Cen.	Priv.	Pub.	Out.	Pro.	Per.	Moral
Centrality	–	–	–	–	–	–	–
Private Regard	.34***	–	–	–	–	–	–
Public Regard	-.25***	-.15**	–	–	–	–	–
Out-Group Regard	-.34***	-.12*	.18**	–	–	–	–
Prosocial	.50***	.31***	-.16**	-.49***	–	–	–
Motivation							
Personal	.45***	.37***	-.05	-.18**	.42***	–	–
Motivation							
Moral Motivation	.54***	.26***	-.14*	-.53***	.77***	.38***	–
Strictness	.16**	-.05	.07	-.19***	.21***	.11	.26***

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

Table 5
Bivariate correlations between DIQ subscales and the Big Five factors of personality (Study 2). E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness.

	E	A	C	N	O
Centrality	.17**	.14*	.07	-.11	.02
Private Regard	.09	.15*	.09	-.26***	.14*
Public Regard	-.10	-.05	.20***	-.05	-.07
Out-Group Regard	-.12*	.16**	.22***	-.02	.22***
Prosocial Motivation	.17**	.03	-.07	-.07	-.04
Personal Motivation	.08	.12	.13*	-.17**	.16**
Moral Motivation	.13*	-.02	-.09	-.07	-.12*
Strictness	-.06	.02	.02	.03	-.13*

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

perspectives, dietarian strictness correlated positively with both centrality, $r(288) = 0.16$, $p = .005$, and moral motivation, $r(288) = 0.26$, $p < .001$.

Rosenfeld and Burrow (2017a) speculate that perceiving dietary out-group members' animal-based food choices as immoral can lead some people to exhibit a low out-group regard. Accordingly, people with a stronger sense of moral motivation should, on average, have lower levels of out-group regard. Indeed, moral motivation and out-group regard correlated negatively, $r(288) = -0.53$, $p < .001$. Private regard should also relate to motivation. Viewing their food choices as benefitting themselves, people with a stronger sense of personal motivation should hold positive feelings toward following their dietary pattern and hold others who eat similarly in a high regard. Reflecting this, private regard and personal motivation correlated positively, $r(288) = 0.37$, $p < .001$.

Eschewing animal products can lead some people to face interpersonal conflicts and to feel stigmatized (e.g., Larsson, Rönnlund, Johansson, & Dahlgren, 2003; LeRette, 2014; MacInnis & Hodson, 2017), which is theorized to contribute to the development of a low public regard (Rosenfeld & Burrow, 2017a). The more negatively people think that others view them for following their dietary pattern, the more they should perceived their dietary pattern as socially restrictive. Supporting this relationship, public regard and perceived dietary restrictiveness correlated negatively, $r(287) = -0.24$, $p < .001$.

Existing scales from the food-choice literature share theoretical commonalities with the DIQ motivation subscales and can provide evidence for the DIQ's convergent validity. Lindeman and Väänänen's (2000) ecological welfare scale assesses the extent to which people consider animal welfare and environmental protection when making food choices, two concerns that encompass aims at benefitting causes beyond oneself. As such, people who emphasize ecological welfare should feel a strong sense of prosocial motivation. Indeed, prosocial motivation and ecological welfare concern correlated positively, $r(287) = 0.41$, $p < .001$. Steptoe and colleagues' (1995) FCQ health

subscale assesses the importance people place on eating healthfully, a value that encompasses self-focused goals. Supporting this construal speculation, personal motivation and food-choice health motive correlated positively, $r(284) = 0.39$, $p < .001$. Moral motivation constitutes a third DIQ orientation that resembles Arbit and colleagues' (2017) MFLQ construct of moral meaning of food in life. Indeed, moral motivation and moral meaning correlated positively, $r(285) = 0.56$, $p < .001$.

In sum, we observed significant associations between all eight DIQ variables and theoretically related variables. To discriminate between the effects of DIQ variables and dispositional variability, we conducted partial correlations of these bivariate correlations adjusted for personality (including extraversion, agreeableness, conscientiousness, neuroticism, and openness). All associations between DIQ variables and their theoretically related variables remained significant: Centrality remained positively correlated with private regard, $r(272) = 0.30$, $p < .001$; strictness remained positively correlated with both centrality, $r(272) = 0.17$, $p = .005$, and moral motivation, $r(272) = 0.26$, $p < .001$; moral motivation and out-group regard remained negatively correlated, $r(272) = -0.52$, $p < .001$; private regard and personal motivation remained positively correlated, $r(272) = 0.32$, $p < .001$; public regard and perceived dietary restrictiveness remained negatively correlated, $r(271) = -0.20$, $p = .001$; prosocial motivation and ecological welfare concern remained positively correlated, $r(271) = 0.45$, $p < .001$; personal motivation and food-choice health motive remained positively correlated, $r(269) = 0.35$, $p < .001$; and moral motivation and moral meaning remained positively correlated, $r(269) = 0.61$, $p < .001$. These results suggest that associations between DIQ variables and related constructs are not reducible to the Big Five personality traits.

6.3. Discussion

CFA results suggest that the 33-item 8-factor DIQ is a suitable method of assessing dietarian identity. Additionally, high internal consistencies (all $\alpha > 0.80$) suggest that items within each of the eight DIQ subscales measure a similar construct. Furthermore, relationships between the DIQ and theoretically linked variables provide evidence that DIQ subscales exhibit sound construct validity.

7. Study 3

In Study 2, we confirmed the DIQ's factor structure, internal consistencies, and construct validities in an unobserved sample recruited via MTurk. In Study 3, we aimed to confirm the DIQ's factor structure on a sample of college students in order to test its generalizability. We also aimed to evaluate the DIQ's test-retest reliability and to compare dietarian identity profiles between vegetarians and omnivores.

7.1. Method

7.1.1. Participants

After excluding 82 participants who completed the survey in fewer than 2 min and/or failed an attention check, 353 participants (78% female) between the ages of 18 and 55 ($M = 20.39$, $SD = 2.95$) were retained for baseline survey analyses. Of these 353 participants, 148 (41.93%) excluded one or more animal products from their diets and 48 (13.60%) self-identified as vegetarian (including vegan).³ Of the

³ At 13.6%, the proportion of this sample that self-identified as vegetarian is evidently higher than that of the general U.S. population, which is estimated to be approximately 5% (e.g., Newport, 2012). We suspect two main reasons for this. First, the proportion of people in the northeastern region of the U.S. who are vegetarian is higher than that in any other region of the U.S. (The Vegetarian Resource Group, 2016). Second, young adults are more likely than are middle-aged or older adults to be vegetarian (The Vegetarian Resource Group, 2016). As such, given that this sample was comprised of college students

353 total participants, 134 completed a follow-up survey. After excluding 19 participants who completed the follow-up survey in fewer than 2 min and/or failed an attention check, 115 participants (82% female) between the ages of 18 and 55 (Mage = 20.49 SD = 4.16) were retained for follow-up survey analyses.

7.1.2. Materials and procedure

Survey materials and procedure were identical to those used in Studies 1 and 2. Instead of monetary compensation, however, participants received course extra credit in return for taking the survey. All participants who completed the baseline survey were invited to take a follow-up survey including only the DIQ approximately two weeks later. Participants who completed the follow-up survey did so an average of 13.61 (SD = 1.32) days after having taken the baseline survey.

7.2. Results and discussion

7.2.1. Confirmatory factor analysis

In order to replicate findings from Study 2 and to assess the DIQ's fit on a sample of college students, whose demographics differ from those of participants on MTurk, we conducted another CFA. According to guidelines for evaluating fit indices (e.g., Hu & Bentler, 1999; Kahn, 2006; Kenny, 2011; Matsunaga, 2010), the DIQ model revealed a reasonable fit, $\chi^2(467) = 1156.45$, $p < .001$, CFI = 0.937, RMSEA = 0.065, SRMR = 0.050. All eight DIQ subscales exhibited high internal consistencies (see Table 6).

7.2.2. Test-retest reliability

Test-retest reliabilities ranged from $r = 0.62$ for private regard to $r = 0.80$ for prosocial motivation (see Table 7). While four of the eight subscales exhibited strong reliabilities of 0.70 or higher, the other four subscales exhibited reliabilities greater than 0.60 but less than 0.70 and thus appear to be marginally susceptible to temporal variance.

7.2.3. Vegetarian-omnivore DIQ differences

Given that our framework for constructing the DIQ emerged out of Rosenfeld and Burrow's (2017a) model of vegetarian identity, we decided to conduct exploratory analyses to examine DIQ differences between vegetarians and omnivores. Much research has investigated ways in which vegetarians and omnivores construe their food choices and relations with animals divergently (e.g., Anderson, Wormwood, Barrett, & Quigley, 2017; Bilewicz, Imhoff, & Drogosz, 2011; Filippi et al., 2010; Forestell, Spaeth, & Kane, 2012; Lindeman & Sirelius, 2001; Ruby, 2008). As vegetarians and omnivores socially identify with distinct dietary categories, understanding differences in the dietarian identity profiles of these groups is of particular interest.

Our total sample included 48 vegetarians (i.e., participants who self-identified as vegetarian and/or vegan) and 305 omnivores. Analyses revealed that vegetarians and omnivores differed significantly from one another on all eight DIQ variables (see Table 8).

8. General discussion

Our results suggest that the DIQ offers a psychometrically sound instrument for assessing dietarian identity: how people think, feel, and behave with respect to consuming or eschewing animal products (see Appendix for final DIQ). While dietarian identity differs from vegetarian identity in pertaining to any individual's self-perceptions with respect to their dietary patterns, rather than self-perceptions of being a vegetarian, we suggest that investigators draw upon the UMVI

Table 6
DIQ subscale internal consistencies (Study 3).

DIQ Subscale	Cronbach's α
Centrality	.94
Private Regard	.83
Public Regard	.94
Out-Group Regard	.93
Prosocial Motivation	.97
Personal Motivation	.87
Moral Motivation	.93
Strictness	.87

Table 7
2-week test-retest reliabilities of DIQ subscales (Study 3). All correlations were significant ($ps < .001$).

DIQ Subscale	Test-Retest Reliability (Pearson's r)
Centrality	.70
Private Regard	.62
Public Regard	.63
Out-Group Regard	.69
Prosocial Motivation	.80
Personal Motivation	.63
Moral Motivation	.72
Strictness	.76

Table 8
DIQ differences between vegetarians and omnivores (Study 3).

Dietarian Identity	Vegetarians (n = 48)	Omnivores (n = 305)	t-value	Cohen's d	p-value
	Mean (SD)	Mean (SD)			
Centrality	4.76 (1.51)	3.42 (1.71)	5.62	0.83	< .001
Private Regard	5.38 (0.96)	4.20 (1.26)	7.54	1.05	< .001
Public Regard	3.67 (1.76)	5.06 (1.62)	5.12	0.82	< .001
Out-Group Regard	5.65 (1.47)	6.50 (0.76)	3.91	0.73	< .001
Prosocial Motivation	5.29 (1.51)	2.46 (1.27)	12.28	2.03	< .001
Personal Motivation	5.32 (1.36)	4.59 (1.65)	3.34	0.48	.001
Moral Motivation	4.74 (1.89)	2.10 (1.16)	9.41	1.68	< .001
Strictness	5.56 (1.65)	2.98 (1.45)	10.21	1.66	< .001

(Rosenfeld & Burrow, 2017a) as a conceptual framework for implementing the DIQ. Doing so, investigators can employ theoretically grounded predictions about dietarian identity. In pursuing research questions, moreover, we encourage investigators to continue to examine the DIQ's construct validity and reliability further. Scale development and validation is a process, and the investigations reported here constitute a starting point on which future research should build.

The DIQ encompasses scales for four of the ten UMVI dimensions: centrality, regard (including three subscales), motivation (including three subscales), and strictness. However, in order to understand dietarian identity most holistically, investigators should also consider the remaining UMVI dimensions that are not assessed with scales. These dimensions include historical embeddedness, timing, duration, salience, dietary pattern, and label (see Rosenfeld & Burrow, 2017a for review). We encourage investigators to measure these dimensions in ways that are most relevant to their needs and tailored to research questions at hand. For example, in measuring historical embeddedness, one might note whether participants are from a rural, suburban, or urban area; their country or state of origin; the prevalence of vegetarians in their region; or the types of restaurants in their vicinity, and so forth. Moreover, in measuring timing, one investigator might be interested in the age at which participants first started thinking about

(footnote continued)

from a university in the northeastern U.S., we imagine that these two factors yielded a higher-than-average proportion of vegetarians.

limiting their animal product intake, whereas another investigator might be interested in noting whether or not participants plan to continue following their dietary patterns for the remainder of their lives.

Like other identity scales (e.g., the Multidimensional Inventory of Black Identity, Sellers et al., 1997), the DIQ contains both personal and social identity components. Future research should examine distinctions between personal and social identity within vegetarian identity. We reason that some dimensions of vegetarian identity capture dieters' group experiences (i.e., centrality, regards), whereas other dimensions are more personal in nature (i.e., motivations, strictness). Nevertheless, the lines between personal and social identity dimensions can be blurred. For example, research often categorizes vegetarians into groups by their dietary motivation, such that investigators might compare ethically motivated vegetarians with health-motivated vegetarians (e.g., Hoffman et al., 2013; Jabs, Devine, & Sobal, 1998; Radnitz, Beezhold, & DiMatteo, 2015; Rothgerber, 2014a, 2014b). While dietary motivation is a highly individual construct, intrinsic to each person, it can still underlie instances of social categorization.

Given that the DIQ emerged out of the recently introduced UMVI (Rosenfeld & Burrow, 2017a), additional research is needed to conceptualize vegetarian identity constructs more precisely. Investigators should work toward refining the theoretical underpinnings of these constructs, factors that shape how people score on them, and the cognitive and social implications of scoring high or low on them. For example, how might eschewing animal products—perhaps by becoming a vegetarian or vegan—situate an individual within a minority group in society, alter his or her perceptions of power and status, and consequently influence his or her perceptions of in-groups and out-groups? To what extent does moralizing a food choice promote positive and negative attitudes toward in-group dieters (i.e., private and public regards) and out-group dieters (i.e., low out-group regard)? Through what means does making certain food choices lead people to define themselves by their diets (i.e., exhibit a high centrality)?

Our operationalization of dietary pattern centers on which of the following five animal products people generally do and do not eat: red meat, poultry, fish, eggs, and dairy. However, some individuals choose to exclude other types of animal products, such as honey or gelatin, from their diets (Gill, 2015; Hoffman et al., 2013). Moreover, variations exist across cultures and over time concerning which species and body parts of animals are normative to consume. Investigators should be mindful of these differences in examining how people construe the use of animal products. Animal-product avoidance can also extend beyond food choice, as people may aim to refrain from wearing clothing products made of materials such as fur or leather. As these avoidance intentions and behaviors can be central to values that underlie one's vegetarian identity and thus of interest to investigators, we wish to highlight that they are beyond the scope of the DIQ. While the DIQ, used with our initial “dietary pattern” prompt, might provide a useful tool for exploring correlates of these intentions and behaviors, it does not assess the ways in which people construe the use of animal products beyond red meat, poultry, fish, eggs, and dairy. To overcome this, future research should consider varying which animal products this initial prompt includes in order to apply the DIQ to a broader range of research questions.

Much remains unknown about the psychological underpinnings and consequences of animal-product consumption and avoidance, and the DIQ can enable investigators to adopt a novel approach to lingering inquiries. For example, what DIQ variables predict ways in which following one's dietary pattern affects one's social relationships? Why might some vegetarians perceive their food choices to be more socially restrictive than do other vegetarians? Do adverse social implications of food choice arise out of following a particular dietary pattern or out of self-identifying with a particular label? Moreover, what internalizations (e.g., centrality or out-group regard) or externalizations (e.g., dietary-pattern restrictiveness or strictness) of vegetarian identity might predict the extent to which people perceive following their dietary patterns as

socially restrictive?

Future research should aim to cultivate a deeper understanding of the causal links between vegetarian identity dimensions, as our findings suggest that significant associations between dimensions are prevalent. Given that motivation underlies decisions to follow one's dietary pattern, understanding how vegetarian identity profiles differ across people who have different dietary motivations can provide insights into these mechanisms. Investigators might also benefit from using the DIQ to predict aspects of vegetarian identity lifespan timing. For example, future work should examine the vegetarian identity profiles of former vegetarians, DIQ predictors of vegetarian duration, identity profiles of individuals who are most likely to go vegetarian in the future, and the intersectionality of these variables with other self-conceptual and social-contextual domains.

Distinctions between dietary pattern and label put forth another avenue for future research wherein the DIQ can provide insight. Why do some self-identified vegetarians eat meat occasionally? Why do some people who follow a meat-free dietary pattern refrain from referring to themselves as vegetarian or vegan? How do flexitarians, or semi-vegetarians, fare in relation to these questions? How do vegetarians and vegans differ from one another?

As vegetarian identity transcends categorical boundaries related to label, the DIQ offers a suitable instrument for investigating diet-label discrepancies and for comparing people across different dietary categories. We reason that the DIQ may be most useful for examining within-group heterogeneity among animal-product avoiders and between-group comparisons of avoiders and non-avoiders. Studying within-group variations related to the psychology of eating meat, meanwhile, is a different area of inquiry than that which we have aimed to address in this paper. Other scales—e.g., Rothgerber's (2012) Meat-Eating Justification (MEJ) scale or Piazza et al.'s (2015) 4N scale—are likely to be more insightful for testing research questions that pertain principally to within-group heterogeneity among omnivores.

Given that the DIQ centers on dietary pattern, we note that the interpretation of DIQ scores depends on what types of dieters participants are. For example, as private, public, and out-group regards capture perceptions related to in-groups and out-groups, these constructs will mean something different for different types of dieters. The tangible meanings of scores on these subscales may be fluid depending on the demographic taking the questionnaire (e.g., whether participants eschew any animal products or not).

Future research should examine potential differences in how people who restrict certain animal products from their diets and people who do not restrict animal products construe vegetarian identity motivation and strictness. In Western cultures, eating animal products is a social norm. An omnivorous diet is often a default diet that people follow from early on in their lives without much conscious consideration. As such, the decision to avoid animal products is more likely to require intrinsic motivation to go against a norm, whereas reflecting on why one eats animal products might lead one to rationalize (e.g., Piazza et al., 2015) or justify (e.g., Rothgerber, 2012) this food choice post-hoc rather than to explain a motive behind it. Similarly, self-perception theory suggests that people might report having dietary attitudes that, while resembling motivations, may truly constitute inferences about their convictions that they derive from partaking in their eating behaviors (Bem, 1972). An interesting avenue for future work may involve distinguishing between motivations that precede food choice and post-hoc justifications that follow food choice.

The distinction between motivation versus justification, nevertheless, indicates not that omnivores lack a sense of vegetarian identity motivation but that many omnivores may simply score low on vegetarian motivation. Indeed, we found that omnivores scored lower on all three DIQ motivational orientations than did vegetarians, supporting a social norm perspective that omnivorous dieting is more of a default choice. Yet within-group variations can exist, as motivation to eat animal products may indeed be strong for some omnivores. Omnivores who are

strongly attached to eating meat (e.g., Graça, Calheiros, & Oliveira, 2015), for example, might make a conscious effort to eat meat in order to maintain social relations or to affirm a cultural or gender identity. For such individuals, eating animal products can be a highly conscious food choice.

Social norms can also be localized. Whereas global norms may constitute dietary norms at a societal or cultural level, local norms may constitute dietary norms within a friend group or in a particular social context (Prentice & Miller, 1993). When the global norm in Western cultures is to eat animal products, many people may follow this diet by default, giving little attention to these dietary decisions. Nevertheless, local norms may make dietarian identity salient for omnivores. For an omnivore who lives with vegetarian family members, or for an omnivore eating out to dinner at a vegetarian restaurant, plant-based dieting becomes the local norm, such that the decision to eat meat may categorically distinguish an individual from the majority. In such cases, omnivores likely engage with the construct of motivation, as they need to consciously consider whether they seek to violate this local norm. Just as vegetarians draw upon motivation in going against a global norm, so too may omnivores be motivated to go against local norms at times. One's dietary motivations, and the fact that one is an omnivore, can readily become salient.

Different types of dieters may construe matters related to strictness differently, depending on whether they restrict certain animal products from their diets or not. For vegetarians, strictness reflects how strictly one holds oneself to one's aim of eschewing meat, such that a low strictness vegetarian may eat meat from time to time. We presume that omnivores, likewise, would construe strictness as the extent to which they follow their diets. That is, strictness need not operate on an aim at excluding foods. For omnivores, the aim within dietary pattern is to include animal products in one's diet. We reason that the DIQ's strictness scale assesses the extent to which omnivores adhere to their unrestricted diets of consuming all animal products listed in the dietary pattern prompt. For example, an omnivore who eats vegetarian meals often would likely report a low level of strictness. Future research should examine what strictness means to people without any dietary restrictions and the extent to which strictness may interact with feelings of authenticity and self-consistency.

We reemphasize that food choice is multifaceted, dynamic, and multilevel (Sobal et al., 2014). To this point, we have restricted the scope of the DIQ to pertain solely to animal-product consumption and avoidance. Nevertheless, as both identities and food-choice processes often share commonalities across their respective domains, we speculate that many constructs within dietarian identity may have relevance for studying eating behaviors beyond the animal-product realm. As the current research speaks only to how the DIQ operates when the initial “dietary pattern” prompt pertains to animal products as we have done, we have reservations about generalizing the applicability of this scale to other domains of eating behavior by varying this “dietary pattern” prompt. The factor structure, internal consistency, construct validity, and test-retest reliability of the DIQ might vary depending on which type of initial prompt is used. The types of motivations assessed in this scale, for example, are grounded in the UMVI framework (Rosenfeld & Burrow, 2017a). Based on research examining what motivates people to eschew animal products, the UMVI puts forth prosocial, personal, and moral motivations as three types of dietary goal orientations. Other domains of dieting—e.g., following a Paleo diet, eating only organic foods, or eating locally, etc.—likely entail different moral, ecological, religious, health, financial, and food safety concerns, and so forth. Thus, it is unknown whether the DIQ motivation constructs capture the central facets of how people construe dietary decisions unrelated to animal products. Given the intricate nature of food choice, there could be great differences between how people construct identities around different domains of dietary decisions. In some regards, the DIQ may be useful in studying other forms of eating and dieting. However, conclusions about its applicability warrant future

psychometric research.

Ultimately, no single instrument can provide a comprehensive means of assessing self-perceptions with respect to eating behavior. In this paper, we have honed in on a particular domain of food choice—namely, which animal products people include in or exclude from their diets. With the DIQ, investigators can explore systematically how people construe this decision.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.appet.2018.05.003>.

Appendix

The Dietarian Identity Questionnaire (DIQ)

Dietary pattern:

In general, which of the following food groups do you **not** eat? Please select all that apply. If you generally eat all of these food groups, please select the last response.

- I generally do not eat red meat
- I generally do not eat poultry
- I generally do not eat fish
- I generally do not eat dairy
- I generally do not eat egg
- I generally eat all of these food groups

For the rest of this survey, please note that your “dietary pattern” represents those foods you indicated above. For example, if you selected “red meat” and “dairy,” your dietary pattern excludes red meat and dairy. If you selected the last response, your dietary pattern includes all of these foods.

Please indicate how strongly you agree or disagree with each of the following statements.

**Note (for investigators):*

Responses to all items range from 1 (Strongly Disagree) to 7 (Strongly Agree).

“(R)” indicates a reverse-scored item.

Centrality

1. My dietary pattern is an important part of how I would describe myself.
2. My dietary pattern has a big impact on how I think of myself.
3. A big part of my lifestyle revolves around my dietary pattern.
4. My dietary pattern defines a significant aspect of who I am.
5. Following my dietary pattern is an important part of who I am.

Private Regard

1. People who follow my dietary pattern tend to be good people.
2. Following my dietary pattern is a respectable way of living.
3. People who follow my dietary pattern should take pride in their food

choices.

Public Regard

1. People who follow my dietary pattern are judged negatively for their food choices. (R)
2. People who follow my dietary pattern tend to receive criticism for their food choices. (R)
3. Following my dietary pattern is associated with negative stereotypes. (R)

Out-Group Regard

1. I view people as less moral for eating foods that go against my dietary pattern. (R)
2. I judge people negatively for eating foods that go against my dietary pattern. (R)
3. Seeing people eat foods that go against my dietary pattern makes me upset or angry. (R)
4. If I see someone eat foods that go against my dietary pattern, I like him or her less. (R)
5. It bothers me when people eat foods that go against my dietary pattern. (R)
6. Seeing someone eat foods that go against my dietary pattern makes him or her less attractive to me. (R)
7. People should feel guilty about eating foods that go against my dietary pattern. (R)

Prosocial Motivation

1. I view my dietary pattern as a way of making the world a better place for others.
2. Concerns about social issues motivate me to follow my dietary pattern.
3. I follow my dietary pattern because I want to benefit society.
4. I feel motivated to follow my dietary pattern because I am concerned about the effects of my food choices on other beings.
5. I am motivated to follow my dietary pattern because I want to help others.
6. I follow my dietary pattern because eating this way is good for the world.

Personal Motivation

1. I follow my dietary pattern because I am concerned about the effects of my food choices on my own well-being.
2. I follow my dietary pattern because eating this way improves my life.
3. When thinking about which animal products to consume, I consider the effects of my food choices on my own health.

Moral Motivation

1. I feel that I have a moral obligation to follow my dietary pattern.
2. I am motivated to follow my dietary pattern because eating foods that go against my dietary pattern is immoral.
3. I follow my dietary pattern because eating this way is the morally right thing to do.

Strictness

1. I can be flexible and sometimes eat foods that go against my dietary pattern. (R)
2. From time to time, I eat foods that go against my dietary pattern. (R)
3. I would eat a food product that goes against my dietary pattern if I were to hear that it tastes exceptionally good. (R)

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