



Research Review

Vegetarianism. A blossoming field of study[☆]

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ABSTRACT

Vegetarianism, the practice of abstaining from eating meat, has a recorded history dating back to ancient Greece. Despite this, it is only in recent years that researchers have begun conducting empirical investigations of the practices and beliefs associated with vegetarianism. The present article reviews the extant literature, exploring variants of and motivations for vegetarianism, differences in attitudes, values and worldviews between omnivores and vegetarians, as well as the pronounced gender differences in meat consumption and vegetarianism. Furthermore, the review highlights the extremely limited cultural scope of the present data, and calls for a broader investigation across non-Western cultures.

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Introduction

Ethical and spiritual concerns have motivated abstention from meat since ancient times, dating back to Greek philosophers Pythagoras, Plato, Plutarch, and Porphyry (Spencer, 1993). More recent philosophical arguments that have been put forth for vegetarianism include anti-speciesism (Singer, 1976), anti-carnism (Joy, 2010), concern with the killing of animals (Rozin, 2004; Twigg,

1979), animal rights (Regan, 1984), and a feeling of community and identity with the animal world (Clark, 1984). In contrast, scientific arguments for the health benefits of a vegetarian diet are relatively recent, first emerging in the 19th century (Whorton, 1994). For all its history, vegetarianism is notoriously difficult to quantify and study. Scholars and laypeople alike vary widely even in how they define vegetarianism, with some self-identified vegetarians eschewing all animal products, and others occasionally consuming meat, fish, and poultry, while still calling themselves vegetarian. Indeed, confusion around the use of the term 'vegetarian' has presented problems for empirical research (Weinsier, 2000).

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Recent polls indicate that approximately 8% of Canadians (Ipsos-Reid, 2004) and 3% of US Americans identify as vegetarian (Cunningham, 2009). Additional polls estimate rates of 3% in the UK (UK Food Standards Agency, 2009), 1–2% in New Zealand (Bidwell, 2002), and 3% in Australia, with markedly higher rates of 6% in Ireland, 9% in Germany, 8.5% in Israel, and 40% in India (European Vegetarian Union, 2008). Though these are minorities, they are not small minorities. Thus, vegetarianism stands as an important phenomenon that is well worth empirical investigation. Indeed, numerous scholars have begun the process of formalizing the study of vegetarianism, and their results have far-reaching implications for the ways we think about meat consumption and the reasons that many are beginning to eschew it.

Most vegetarians in the West were not raised as such, but made a decision to convert from a meat-eating diet (Beardsworth & Keil, 1991b) for a range of reasons, including concern about animal welfare, environmental sustainability, and personal health (Beardsworth & Keil, 1991a; Fox & Ward, 2008; Rozin, Markwith, & Stoess, 1997). In India, the practice of vegetarianism has been firmly established for centuries, associated with tradition, power and status, and is a practice into which one is generally born. Furthermore, it appears to be chiefly concerned with the domains of asceticism and purity, such that the aim of vegetarianism is to keep the body free of the pollution associated with meat (Caplan, 2008; Preece, 2008; Spencer, 1993). Across the currently surveyed cultures, women are more likely to be vegetarian than men (Beardsworth & Bryman, 1999; Smart, 1995; Stahler, 2005; White & Frank, 1994; Worsley & Skrzypiec, 1998), and have been at the forefront of modern vegetarian movements (e.g. Leneman, 1997; Leneman, 1999; Spencer, 1993). As with much of the psychological database (Arnett, 2008), the literature on vegetarianism is largely drawn from Western cultures, leaving the cross-cultural generalizability of the literature open to question (Henrich, Heine, & Norenzayan, 2010).

Thus, this review attempts to answer several important questions: What exactly is a vegetarian, and what motivates him or her to abstain from meat? Among these motivations, which are the most common, and what implications do they have for health, diet, and attitudes toward meat? How do vegetarians and omnivores differ in the ways in their politics, worldviews, and interactions with others, and how do they view one another? Given the drastically different rates of vegetarianism between men and women, how else do they differ in the way in which they approach vegetarianism and meat eating? Throughout the review, the limited cultural scope of the current literature will also be highlighted.

Definitions and motivations

Although a common definition of a vegetarian is someone who does not eat red meat, poultry, or fish, there is considerable inconsistency in the literature and in how people self-identify. In a Canadian survey, the National Institute of Nutrition (1997) found that 90% of self-identified vegetarians consume milk or dairy products, 78% sometimes consume fish or seafood, 71% sometimes eat eggs, 61% sometimes eat poultry, and 20% sometimes eat red meat. More recently, the number of self-professed Canadian vegetarians who eat red meat has increased to 34% (National Institute of Nutrition, 2001). Similarly, in a study of women in the Southwest USA, 40% of self-identified vegetarians consumed meat products (Kwan & Roth, 2004), and in a broader survey of US Americans, only 36% of self-identified vegetarians said that they never ate poultry, 30% said that they never ate fish, and 64% said that they never ate red meat (Krizmanic, 1992). This inconsistency has also been found among women physicians in the United States: although 8% of

participants identified themselves as vegetarian, only 5% reported having eaten no meat, poultry, or fish in the week before the survey (White, Seymour, and Frank, 1999). A comparable discrepancy has also been found among Canadian women (Barr & Chapman, 2002), in a representative sample in the USA (Gossard & York, 2003), as well as in Swiss (European Vegetarian Union, 2008) and British general populations (Willets, 1997).

Beardsworth and Keil (1991b, 1992) have proposed that vegetarianism is better measured as a continuum of categories, measuring the progressive degree to which animal foods are avoided. At one end of the spectrum are Type I vegetarians, those who consider themselves vegetarian, yet occasionally eat red meat or poultry, typically resulting from the temporary unavailability of vegetarian food option, or from the desire to avoid embarrassment in social settings where meat is being served. Type II vegetarians avoid consuming meat and poultry, Type III vegetarians also avoid fish, Type IV also exclude eggs, and Type V exclude dairy products produced with rennet (enzymes extracted from the stomach of young calves). At the opposite end of the spectrum are Type VI vegetarians, or vegans, who consume only vegetable-derived foods, avoiding all animal-derived food products.

People not only define vegetarianism in vastly different ways, but their motivations for pursuing a vegetarian diet also cover a wide territory. Among the majority of recent studies, the most commonly reported motivation given by vegetarians is concern about the ethics of raising and slaughtering non-human animals (e.g. Beardsworth & Keil, 1991a; Fox & Ward, 2008; Hussar & Harris, 2009; Jabs, Devine, & Sobal, 1998b; Neale, Tilston, Gregson, & Stagg, 1993; Santos & Booth, 1996). Concern for personal health appears as the second most common motivation, and the environmental impact of meat consumption, spiritual purity, and disgust at the sensory properties of meat emerge as other common motivations (see Table 1 for an overview).

As noted by Beardsworth and Keil (1992), people's motivations for being vegetarian are not static, and can be added, dropped, or modified over time. Among a sample of vegetarian adults in the UK, 74% of participants reported having changed their motives for being vegetarian; 34% had added a motive, 13% had dropped a motive, and 23% had both added new motives and dropped original motives (Hamilton, 2006). Along with motivations for being a vegetarian, the range of foods that one eats also tends to change over time. In a survey of current and former vegetarian women in Vancouver, Canada, Barr and Chapman (2002) found that the majority of current vegetarians consumed a smaller range of animal products than when they first became vegetarian (63%). Many of them attributed this change to having learned more about vegetarian nutrition and factory farming, leading primarily to a decreased consumption of dairy products and eggs. Additionally, 42% of the sample reported intentions to eat even fewer animal foods. 27% had not changed the number of animal products they consumed, and the remaining 10% had increased the number of animal products in their diet.

Non-vegetarians hold similar beliefs about why one might be motivated to follow a vegetarian diet, albeit in a different order. In a random sample of Southern Australians, non-vegetarians were more likely to endorse health reasons as possible benefits of a vegetarian diet, such as eating more fruits and vegetables (74%), consuming less saturated fat (65%), and controlling one's weight (40%), than they were to endorse reasons of animal welfare (36%) or helping the environment (22%; Lea & Worsley, 2003). Women were significantly more likely than men to agree that a vegetarian diet can help animal welfare (40% vs. 31%).

Just as people report common motivations for becoming vegetarian, so too do people perceive common barriers. Lea and Worsley (2003) found that the primary perceived barrier for both men and women was the enjoyment of eating meat (78%),

Table 1
Motivations for vegetarianism.

Study	Location	N	% Women	Moral	Health	Percent giving reason		Religion	Other
						Environment	Disgust		
Beardsworth and Keil (1991b)	UK	76	51.32	65.79	26.32	1.32	19.74		
Fox and Ward (2008)	USA, Canada, UK	33	70	45	27	3			25
Hamilton (2006)	UK	47	61.7	48.94	34.04		10.64		19.15
Hussar and Harris (2009)	USA	16	68.75	71.9	6.25		9.4	9.4	15.6
Jabs et al. (1998)	USA	19	68.42	57.9	42.11				
Krizmanic (1992)	USA	301	68	19	46	4			30
Neale et al. (1993)	UK	174	100	91	39			6	37
Potts and White (2008)	New Zealand	155	77.42	53.71		7.1		14.52	
Preylo and Arikawa (2008)	USA	72	79.17	68.1					31.9
Rozin et al. (1997)	USA	104	66.35	64.1	76.7	60.7	53	22.6	55.4
Santos and Booth (1996)	UK	13	100	92	0		61		23
White, Seymour, and Frank (1999)	USA	360	100	41.6	69	32.1	40.6	30	10.7

following by the unwillingness to change one's eating habits (56%), the belief that humans are meant to eat meat (44%), that one's family eats meat (43%), and lack of knowledge about vegetarian diets (42%). Distinct gender differences emerged, such that more men than women believed that humans are meant to eat meat (49% vs 39%), and that women were more likely than men to report the unwillingness of their family, spouse, or partner as a significant barrier (39% vs 18%). In another study of Australian secondary school students, participants' spontaneous reports of reasons for not becoming vegetarian revealed a different pattern – pressure by others to eat meat was the most common (women 20%, men 16%), followed by the perception that vegetarianism is unhealthy (women 19%, men 16%), and liking meat too much (women 19%, men 23%; Worsley & Skrzypiec, 1998).

After people have transitioned to vegetarianism, what factors help them maintain their diet, and what factors cause some of them to abandon it? In a study of vegetarians in Western New York State, Jabs, Devine, and Sobal (1998a) found that three major factors are important in maintaining a vegetarian diet. The first maintenance factor, personal factors, includes convictions about the welfare of animals, reaching and maintaining what one believes to be a healthy weight on a vegetarian diet, and skills and knowledge about vegetarian cooking. The second maintenance factor, social networks, includes having close friends who are also vegetarian, being involved in a vegetarian, animal rights, or environmental advocacy group, and receiving support from family members. The third maintenance factor, environmental resources, includes availability of prepared vegetarian meals and accessibility of vegetarian food products in stores (e.g. tempeh, seitan, soy milk). Social networks appear to be especially critical in maintaining a vegetarian diet, as 95% of the sample was involved in a group that explicitly supported vegetarianism. Although receiving support from family members is an important maintenance factor, Jabs et al. (1998a) found that “in general, respondents' nuclear families were not supportive of vegetarian diets” (p. 186). A similar pattern has emerged in British samples; for many participants interviewed by Beardsworth and Keil (1991b), desires to become vegetarian as a child or adolescent were suppressed by their parents, and “their vegetarian tendencies had lain dormant until they reached an age that had provided them with a degree of independence from parental control” (p. 21).

Just as some people transition to vegetarianism, some transition away from it. In a representative quota sample of British adults, which reported the proportion of vegetarians as 3%, an additional 2% of the sample had previously been vegetarian, but lapsed back into eating meat (MORI/Sunday Times, 1989; cited in Beardsworth & Keil, 1992). Research on ex-vegetarians is extremely sparse, but some insight into this process comes from a study of formerly

vegetarian women in Vancouver, Canada. Of these women, 29% cited health concerns (e.g. fatigue, anemia) as causing them to resume an omnivorous diet, 23% resumed because of missing the taste of meat, 20% because of a change in living situation (e.g. moving in with a meat-eating family), and 17% because of the perception that being a vegetarian was too time consuming (Barr & Chapman, 2002).

The present literature indicates that the term “vegetarian” has become quite vague indeed, ranging from those who occasionally eat meat but consider themselves to vegetarian, to those who consume no animal products whatsoever. Enjoyment of meat eating and family pressures to eat meat appear as common barriers to people who might otherwise abstain, whereas concern for the ethics of animal slaughter and the negative impact of meat consumption on personal health emerge as the chief motivations of vegetarianism among Western populations. Social support emerges as a critical factor in maintaining a vegetarian diet, along with convictions about the welfare of animals, knowledge of vegetarian nutrition, and availability of vegetarian food products. Conversely, factors that most commonly cause people to abandon vegetarianism are health concerns related to improper nutrition, missing the taste of meat, and moving into a new environment, such as a household where meat-eating is the norm. Given the divergence in definitions of and motivations for vegetarianism, measuring what animals products one does and does not consume, and one's reasons for doing so, is integral to a more precise study of vegetarianism. Additional research on the influences that cause women and men to abandon vegetarian diets would also enrich the field's understanding of vegetarianism.

Health-oriented and ethically-motivated vegetarians

Given the very different nature of health and ethics motivations, the one focused on one's own welfare, and the other focused on the welfare of others, how else do health-oriented and ethically-oriented vegetarians differ? It appears that the process of becoming a vegetarian unfolds very differently, depending on one's motivations. In a study of vegetarians in Western New York State, Jabs, Devine, and Sobal (1998b) proposed two separate models for the adoption of a vegetarian diet: health and ethical. Health vegetarians adopted their vegetarian diet out of concern for potential disease, and focused primarily on the various benefits and barriers to changing their diet. They tended to gradually eliminate meat from their diets, and were relatively less likely to transition toward veganism. In contrast, ethical vegetarians adopted their vegetarian diet for reasons of animal welfare, focusing primarily on moral considerations. They tended to adopt their diets abruptly,

associating meat with disgust and emotional distress, and reducing this distress by creating consistency between their diet and their beliefs about animal welfare. Furthermore, this focus on animal welfare was associated with a greater likelihood of transitioning toward veganism. A 'conversion experience,' wherein a sudden link was made between meat and animals, was especially prevalent among participants who adopted vegetarian diets while children or young adults. These results echo the earlier findings of [Beardsworth and Keil \(1991a\)](#), who found a similar link between conversion experiences and an abrupt transition to a vegetarian diet.

[Rozin et al. \(1997\)](#) also found distinct differences between ethical and health vegetarians in an adult sample in Pennsylvania. Compared with health vegetarians, ethical vegetarians found meat more disgusting, reported stronger emotional reactions to the consumption of meat, showed more concern when they saw others consume meat, and more strongly believed that consuming meat causes undesirable changes in personality (e.g. increased aggression). Furthermore, participants who began as ethical vegetarians offered a wider range of reasons for their vegetarianism, and avoided a larger range of animal foods. By viewing meat eating as immoral, the authors suggest, they had both an opportunity and incentive to view eating meat as disgusting, further strengthening their commitment to vegetarianism. Subsequent research by [Hamilton \(2006\)](#) provides further support for disgust-related differences between ethical and health vegetarians. Participant reactions to inadvertent consumption of meat included "anxiety, anger, guilt, a sense of contamination, harm, unease, discomfort, queasiness, deep revulsion, and sickness" (p. 164), but these reactions appeared exclusively among ethically-motivated vegetarians – none of the health-oriented vegetarians reported such reactions.

In a study of Finnish college students, [Lindeman and Sirelius \(2001\)](#) have also suggested that health vegetarians and ethical vegetarians have differing ideological bases, with ethical vegetarians more motivated by humanistic values and health vegetarians more motivated by concerns for personal safety and security. Similar results emerged in [Fox and Ward's \(2008\)](#) online study of vegetarians, who were recruited primarily from the US, Canada, and the UK. Again, health vegetarians focused on the effects of a vegetarian diet on personal health, fitness, and energy, whereas "ethical vegetarians often cast their motivations within a philosophical, ideological, or spiritual framework" ([Fox & Ward, 2008, p. 425](#)). Health vegetarians displayed a primarily internal focus, attending to concerns about sustaining personal health and avoiding illness, and ethical vegetarians displayed a primarily external focus, attending towards concerns about non-human animals. These differences in focus were apparent in the critiques of several ethical vegetarians, who perceived health vegetarians as selfish, and motivated to be vegetarian for the wrong reasons.

Thus, a series of major differences have been discovered between people whose vegetarianism is motivated by ethical concerns, and those who are motivated by concern for personal health. Compared to health vegetarians, ethical vegetarians avoid a broader range of animal products have stronger animal welfare concerns, and transition more rapidly to a vegetarian diet. Furthermore, ethical vegetarians often conceptualize their dietary choices in broader terms, explicitly connecting it to larger philosophical frameworks and reacting to meat consumption with more pronounced feelings of disgust. Comparatively little is known about those whose vegetarianism is motivated by other factors, such as religion and concern for the environment, and those who are strongly motivated by more than one factor (e.g., both personal health and animal welfare). Future research on the influence of such motivations would deepen the field's understanding of the processes that shape individuals' decisions to follow a vegetarian diet.

Attitudes toward meat

Given differences in eating practices, it is perhaps unsurprising that vegetarians and omnivores hold very different attitudes toward meat. In what domains do these attitudes differ, and how deeply do these differences run? In an early study of teenage English girls' attitudes towards meat, [Kenyon and Barker \(1998\)](#) found that vegetarian girls had strongly negative associations with meat, linking it with the killing of animals, cruelty, the ingestion of blood, and visceral disgust. The non-vegetarian girls, however, viewed meat very positively, associating it with good taste, luxury, social status, and special occasions such as Christmas and Sunday dinners. Similarly, vegetarian women in Vancouver, Canada reported less liking for the taste of red meat, and perceived it to be significantly less healthy than did omnivorous women ([Barr & Chapman, 2002](#)). Research conducted with Belgian university students provides convergent evidence for differential attitudes toward meat between vegetarians and omnivores. On both the Implicit Association Test (IAT; [Greenwald, McGhee, & Schwartz, 1998](#)) and Extrinsic Affective Simon Task (EAST; [De Houwer, 2003](#)), compared with omnivores, vegetarians had more positive implicit and explicit attitudes toward vegetables and more negative attitudes toward meat ([De Houwer & De Bruycker, 2007](#)). Conceptually similar findings were obtained with university students in Ireland; although both vegetarians and omnivores had more positive implicit attitudes toward vegetables than toward meat, this difference was significantly stronger among vegetarians ([Barnes-Holmes, Murtagh, & Barnes-Holmes, 2010](#)). Complementing research on explicit and implicit attitudes, [Stockburger, Renner, Weike, Hamm, and Schupp \(2009\)](#) investigated differences in selective visual attention to pictures of meat, non-meat, and dessert dishes among vegetarians and omnivores at a German university. In stark contrast to omnivores, vegetarians evaluated almost every meat dish negatively, and meat dishes elicited significantly larger late positive potentials than did vegetable dishes, indicating that vegetarians were paying more selective attention to the meat pictures. This difference occurred even when participants' cognitive resources were diminished by keeping count of the number of dessert pictures. Thus, this study provides evidence that depictions of meat elicit not only strong feelings of aversion for vegetarians, but that they also efficiently capture selective visual attention, enabling vegetarians to avoid accidental ingestion of dishes containing meat.

Even among omnivores, attitudes toward meat eating have been changing in many Western societies. In a survey of UK consumers, [Richardson, Shepherd, and Elliman \(1993\)](#) found that 28% of participants considered themselves to be reducing their overall meat consumption in the past year. Up to 40% of Canadians sometimes actively seek out meatless meals ([Serecon Management Consulting Inc., 2005](#)) and retail grocery sales of tofu and meat analogue products has been on the rise in Canada, increasing by 50% between 2000 and 2003 ([ACNielsen, 2004](#)). In a consumer survey conducted in Norway, 20% reported having reduced their meat consumption ([Bjørkum, Lien, & Kjærnes, 1997](#), cited in [Holm & Møhl, 2000](#)), and similar results were obtained with US American ([Breidenstein, 1988](#)) and Danish populations ([Haraldsdóttir, Holm, Jensen, & Møller, 1987](#), cited in [Holm & Møhl, 2000](#)). According to a survey by the National Restaurant Association, these changes are especially prevalent on college campuses, as approximately 15% of college students in the United States reported eating vegetarian on a typical day ([Walker, 1995](#)).

Research suggests that omnivores are changing their attitudes toward meat for reasons similar to those held by vegetarians. A [GlobeScan Incorporated poll \(2004\)](#) found that approximately 20% of Canadians have boycotted food products due to concern with animal treatment on the farm or during slaughter. Michael

Pollan's *The Omnivore's Dilemma* (Pollan, 2006), which provides readers with an in-depth account of industrial and organic farming, including the factory farming of animals, has enjoyed widespread popularity, being named one of the *New York Times* ten best books of the year (*New York Times*, 2006). Recent research among university students in Pennsylvania found that reading the book led to an array of changes in attitudes toward food, including increased reluctance to eat meat, greater commitment to the environmental movement, and less trust of major food corporations (Hormes, Fincher, & Rozin, submitted for publication). As striking as these effects were, the changes in attitude dissipated over the course of a year, with the exception of attitudes toward the environmental movement. Among a British population, Richardson et al. (1993) found the majority of the sample would completely cease meat eating if they themselves had to slaughter the animals they wanted to eat. Turning to a South Australian sample, Lea and Worsley (2001) found that vegetarian health concerns and appreciation for meat were the chief positive predictors of meat consumption, and number of vegetarian friends was the chief negative predictor of meat consumption. Notably, distinct gender differences emerged, such that the chief predictors of meat consumption among women were health concerns and appreciation for meat, whereas for men, the chief predictor of meat consumption was number of vegetarian friends.

A number of demographic variables have been linked with levels of meat consumption. In a probability sample of US Americans, Rimal (2002) found that both education level and income were positively related to preferences for meatless meals, and inversely related to preferences for red meat. Also, age was positively correlated with preferences for more meatless meals and negatively correlated with the consumption of red meat, and people living in the Northeastern and West Coast of the United States preferred more meatless meals and less red meat than people living in the Midwest. In a later probability sample of US Americans, Gossard and York (2003) also found that social class to be strongly associated with meat consumption – those in laborer occupations ate more meat than those in service and professional occupations, and education level was inversely related to meat consumption (i.e. participants with more education ate less meat). Again, quantity of meat consumption decreased with age, and meat consumption was highest in the Midwest United States. Ethnicity was also significantly associated with meat consumption, such that Black and Asian participants ate more meat than Caucasian participants. The inverse relationship between education level and meat consumption also emerged in a sample of adults in the UK (Fraser, Welch, Luben, Bingham, & Day, 2000). Evidence has also emerged for the early influence of intelligence on meat consumption. In a cohort study in the UK, participants with higher intelligence scores in childhood were more likely to be vegetarians 30 years later (Gale, Deary, Schoon, & Batty, 2007). This relationship was partially accounted for by differences in socioeconomic status, but remained significant even after accounting for these factors.

Thus, there is a sizeable body of evidence that omnivores and vegetarians think of meat in very different terms. Whereas omnivores have positive explicit and implicit attitudes toward meat, associating it primarily with luxury, status, taste, and good health, vegetarians tend to link meat with cruelty, killing, disgust, and poor health. For many vegetarians, these negative associations are strong enough to emerge on an implicit level, and may help vegetarians remain vigilant against the accidental ingestion of meat. Given the telescoping structure of the vegetarian spectrum, which excludes some animal products before others (Beardsworth & Keil, 1991b, 1992), an untested question is whether vegetarians' explicit and implicit attitudes toward different meats follow a similar trajectory – that attitudes towards beef and pork, the meats removed earliest along the spectrum, would be significantly more

negative than attitudes toward fish and poultry. Among those who do eat meat, attitudes have been shifting, such that many people choose to eat vegetarian meals sporadically, citing similar reasons as those given by vegetarians. As many of the studies that report such trends are at least several years old, research on attitudes toward meat in current populations, and a broader array of cultural contexts, would be highly informative.

Values and worldviews

Given pronounced differences in attitudes toward meat and its production, to what extent do vegetarians and omnivores differ in their overall worldviews, beyond issues directly related to meat? Several studies provide convergent evidence that vegetarians and omnivores endorse different sets of values, with liberal values more associated with vegetarians and conservative values more associated with omnivores. In a British cohort sample, vegetarians were more likely than omnivores to be employed in charitable organizations, local government, or education, and were more likely to favor government redistribution of income (Gale et al., 2007). Among women physicians in the US, White, Seymour, and Frank (1990) found those who described themselves as “very liberal” were two times more likely to be vegetarian than those who self-identified as “conservative,” and a study of adults living in the suburbs of Washington, DC found that people holding “traditional values” (e.g. family security, obedience, social order) were less likely to be vegetarian, whereas people holding “altruistic values” (e.g. protecting the environment, equality, social justice) were more likely to be vegetarian (Dietz, Frisch, Kalof, Stern, & Guagnano, 1995). Kalof, Dietz, Stern, and Guagnano (1999) obtained similar findings in a random sample of adults in the USA, such that altruism was a positive predictor of vegetarianism and holding traditional values was a negative predictor of vegetarianism. Furthermore, Kalof et al. found that altruistic values predict participant beliefs that vegetarianism is beneficial to health, environmental protection, animal welfare, and world hunger. Research in the Netherlands samples also found that Dutch vegetarians were more concerned than Dutch omnivores with the ecological and health consequences of their food choices (Hoek, Luning, Stafleu, & Graaf, 2004). Likewise, Peterson, Doty, and Winter (1993) found that US American undergraduate students scoring high in authoritarianism were critical of environmental activism and were more likely to hold the belief that human beings have been given dominion over nature.

Turning to a New Zealand sample, Allen, Wilson, Ng, and Dunne (2000) also found that those with a more pronounced omnivore identity were more likely to endorse right-wing authoritarianism, social hierarchies, and hierarchical domination. In a follow-up study, Allen and Baines (2002) found that presenting these results to omnivorous participants had an effect on their attitudes toward and consumption of meat. Compared to a control group, those participants who read about the link between attitudes toward hierarchy and domination and the consumption of meat subsequently rated meat less favorably, reported decreased identification of meat, reported greater liking of animals typically raised for food, greater opposition to slaughtering, and consumed greater quantities of fruits and vegetables in the following three days. However, these effects emerged only for those participants scoring low in social dominance – those scoring high in social dominance did not differ by condition, suggesting an effort on the part of the low social dominance participants to bring their actions into line with their beliefs.

In a similar domain, Hamilton (2006) investigated attitudes among adults in the UK toward different forms of violence and killing. Compared to omnivores, vegetarians reported greater opposition to the practices of foxhunting and capital punishment, and

greater support for nuclear disarmament initiatives. This anti-violence stance was especially pronounced among ethically-motivated vegetarians. One possible reason for this difference may lie in differences in empathy. In a sample of US American adults, Preylo and Arikawa (2008) found that vegetarians reported greater human-directed empathy than did omnivores, as measured by the Interpersonal Reactivity Index (IRI; Davis, 1983). Complementing and going beyond self-report measures of empathy, a recent study conducted in Italy (Filippi et al., 2010) examined whether people with different dietary choices also show different brain responses to depictions of human and animal suffering. Participants completed the Empathy Quotient Questionnaire (EQ; Baron-Cohen & Wheelwright, 2004), and then, while undergoing fMRI scans, viewed a series of negative valence human and animal images (e.g. murdered people, mutilations, wounds), as well as neutral landscape images. Ethically-motivated vegetarian and vegan participants EQ scores were significantly higher than those of omnivore participants, with no significant difference between EQ scores of vegetarians and vegans. Although fMRI analyses revealed increased recruitment of empathy-related areas of the brain (e.g. the anterior insula, basal ganglia, and thalami) among all three participant groups during observation of negative valence human and animal scenes, ethical vegetarians and vegans had a higher engagement of empathy-related areas than did omnivores.

For some people, one's dietary choices go much further than skin deep. Although many vegetarians and vegans will willingly date those who eat meat (Murphy, 1998), results of a New Zealand study on ethical consumption gathered a great deal of media attention when it was reported that some vegans engage in sexual intimacy only with other vegans. Explanations for this preference included "I could not be in an intimate relationship with someone who was eating animals. Our worlds would just be too far apart..." and "I would not want to be intimate with someone whose body is literally made up from the bodies of others who have died for their sustenance. Non-vegetarian bodies smell different to me" (Potts & Parry, 2010, p. 54). Although only six women out of a sample of 147 reported such sentiments about being intimate with non-vegetarians, this finding led to extensive media hype, and the coining of the terms "vegansexual" and "vegansexuality." The ensuing publicity and online debates that followed garnered enough attention for the *Sydney Morning Herald* to list vegansexuality as "one of the year's biggest health stories" (Reuters, 2007) and for the New York Times to list vegansexuality as one of the top 70 ideas of 2007 (New York Times Magazine, 2007). Responses to this new trend were largely negative, with these women being characterized as sexually deviant, cowardly, and bigoted. Comments posted by heterosexual male omnivores were noted to be particularly aggressive, with common themes of wishing bodily harm and sexual assault on vegansexuals.

In a largely student sample of Canadians and US Americans, Ruby (2008) found that vegans expressed greater concern than vegetarians about the impact of their food choices on animal welfare and the environment. In a primarily non-student sample of omnivores, partial vegetarians, vegetarians, and vegan Canadians and US Americans, Ruby, Cheng, and Heine (2011) found that the further along the vegetarian spectrum participants were, the more positive were their attitudes toward animals, as measured by the Animal Attitudes Scale (Herzog, Betchart, & Pittman, 1991). Furthermore, there were telescoping differences between omnivores, partial vegetarians, vegetarians, and vegans in moral opposition to the eating of animals, concern for animal suffering, concerns about the practices of the meat industry, and the belief that a meatless diet is healthier than a diet including meat, such that omnivores occupied one end of the spectrum and vegans the other, with partial vegetarians and vegetarians occupying the attitudinal middle ground.

Broadly speaking, Western vegetarians tend to be liberal in their political views, place emphasis on environmental protection, equality, and social justice, and oppose hierarchy, authoritarianism, capital punishment, and violence in general. The small but growing body of research investigating vegans suggests that, compared to vegetarians, they hold stronger beliefs about meat eating, animal welfare, and the environment. For a small percentage of vegans, these convictions run so deep that they will not sleep with non-vegans. Furthermore, ethically-motivated vegetarians and vegans report more empathy for the suffering of both humans and animals, and display stronger neural response in empathy-related areas of the brain when viewing scenes of human and animal suffering. What little research has been conducted contrasting vegans and vegetarians indicates that this is a promising direction for future study, especially in the domain of ethics.

Differences in well-being

The aforementioned research suggests links between vegetarianism and higher levels of empathy, altruism, and involvement with charity work. Given the positive associations between prosocial behavior and emotional well-being (e.g., Brunier, Graydon, Rothman, Sherman, & Liadsky, 2002; Dunn, Aknin, & Norton, 2008; Thoits & Hewitt, 2001), do vegetarians also report different levels of well-being? Dwyer, Kandel, Mayer, and Mayer (1974) found that among a sample of young adult vegetarians in the United States, 60% reported experiencing "a more positive state of mind" since adopting a vegetarian diet. These rather vague findings were later supported by Beezhold, Johnston, and Daigle (2010). Among a population of Seventh Day Adventist adults in the southwest United States, vegetarian participants reported more positive mood states than omnivore participants, as reflected by lower scores on both the Depression and Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995), and lower scores on the tension-anxiety, depression-dejection, anger-hostility, and fatigue subscales of the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971). Although these findings are more concrete than those of Dwyer et al. (1974), they remain correlational, and causality cannot be argued. The research on vegetarianism and emotional well-being is exceedingly sparse, and as such, experimental and longitudinal investigations of the potential impact of vegetarianism on emotional well-being would help to fill the empirical void.

Perceptions of vegetarians and omnivores

Given the broad differences between vegetarians in omnivores in attitudes toward meat, dietary practices, political and social attitudes, and worldviews, it stands to reason that they would view each other (and themselves) in quite different terms. How vegetarians are seen has shifted radically over time. During the Inquisition, the Roman Catholic Church declared vegetarians to be heretics, and a similar line of persecutions occurred in 12th century China (Kellman, 2000). In the earlier half of the twentieth century, the sentiment toward vegetarians remained distinctly negative, with the decision not to eat meat being framed as deviant and worthy of suspicion. Major Hyman S. Barahal (1946), then head of the Psychiatry Section of Mason General Hospital, Brentwood, wrote openly that he considered vegetarians to be domineering and secretly sadistic, and that they "display little regard for the suffering of their fellow human beings" (p. 12). In this same era, it was proposed that vegetarianism was an underlying cause of stammering, the cure for which was a steady diet of beefsteak (Dunlap, 1944). Such strongly negative reactions appear to have lessened, but still occur. In 1999, a Salt Lake-area high school made headlines for suspending a student for wearing a t-shirt that said "vegan" on the

back. School administrators defended their decision by claiming that veganism was a gang-related activity (Grossman, 2004).

More recently, a number of researchers have investigated how people perceive vegetarians in modern times. In an early study conducted in Arizona, Sadalla and Burroughs (1986) examined perceptions of people with different dietary habits, finding that vegetarians were seen as pacifist, hypochondriacal, drug-using, weight conscious, and liberal. In contrast, those who eat a diet consisting primarily of fast food were seen as patriotic, pronuclear, conservative, and anti-drug. When asking people of these respective groups how they perceived themselves, a conceptually similar pattern emerged, such that vegetarians perceived themselves to be relatively non-competitive, intellectual, weight-conscious, sexy, and with a penchant toward using recreational drugs. Fast food lovers perceived themselves as religious, conservative, family-oriented, pronuclear, anti-drug, and having a need to win. Although there are some potential confounds, in that some vegetarians and vegans subsist largely on fast food, and that the effect of social class was not examined, this study provided an early insight into perceptions of vegetarians in the United States. In developing the Attitudes Toward Vegetarians Scale with a sample of university students in the southeast United States, Chin, Fisak, and Sims (2002) found that attitudes toward vegetarians were generally positive. People higher in authoritarianism held more negative attitudes toward vegetarians, and women displayed more positive attitudes toward vegetarians than did men. These results are consistent with the results of a survey of teenagers in the United States (reported in Walker, 1995), that teenage girls were more accepting of vegetarians than were teenage boys. However, Chin et al. caution that their results may be unrepresentative, as the majority of their sample were women (81%), self-identified liberals (65%), and knew someone who was vegetarian (84%). Among those who don't eat meat, some vegans accuse vegetarians of moral inconsistency: if vegetarians feel that eating animals is ethically questionable, why then do they consume eggs and dairy, which are intimately tied to the production of chicken and beef? Likewise, some vegetarians find veganism overly restrictive and difficult, viewing vegetarianism as a more practical way to reduce animal suffering (e.g. Beardsworth & Keil, 1991a; Leneman, 1999; Zamir, 2004).

Monin & Minson, 2007 (cited in Monin, 2007) found that omnivores viewed vegetarians as good people, as reflected by higher ratings on Osgood, Suci, and Tannenbaum's (1957) *evaluation* dimension, but they diffused potential threat by calling them weak, as reflected by lower scores on Osgood et al.'s *potency* dimension. Furthermore, this derogation was associated with expected moral reproach. That is, the extent to which participants thought they were seen as morally inferior by vegetarians significantly correlated with the negative valence of words used to describe vegetarians. The strength of this perception was shown to be exaggerated, in that the authors found a significant difference between the morality ratings that omnivores expected from vegetarians and the actual ratings provided by vegetarian participants.

Complementary findings are described in a study of vegetarian children aged 6–10 living in the northeast United States. They do not condemn others for eating meat (evaluating the action as 'ok'), but rather, they view this decision as a personal choice (Hussar & Harris, 2009). These vegetarian children do, however, say that if they themselves were to eat meat, it would be 'very bad,' judging this action to the same degree as moral transgressions such as stealing. Non-vegetarian children seem to view these choices in similar terms – they judge their own eating of meat as 'ok,' but say that if someone who was a committed moral vegetarian were to eat meat, that the act would be 'very bad.' In a related vein of research, Ruby and Heine (2011) investigated how vegetarians and omnivores perceived themselves and each other in the domains of morality and masculinity. Controlling for perceived

healthiness of the student's diet, which has been shown to be linked to perceptions of virtue and masculinity (for a review, see Vartanian, Herman, & Polivy, 2007) both omnivore and vegetarian participants rated vegetarians as significantly less masculine than omnivores, in concordance with the link between men, meat, and masculinity (e.g. Adams, 1991; Sobal, 2005; Twigg, 1979). While both omnivore and vegetarian participants rated vegetarians as significantly more moral than omnivores, this effect was significantly stronger among vegetarian participants. Parallel findings emerged among undergraduate students in Pennsylvania, such that participants rated targets whose favorite foods were "steak and other kinds of beef" as more masculine and less feminine than those whose favorite foods were "vegetable stir fry and other vegetable dishes" (Rozin, Hormes, Faith, & Wansink, in press).

In addition to affecting the perception of one's morality, some have claimed that meat consumption also affects the way one smells (e.g., Potts & Parry, 2010). Recently, Havlicek and Lenochova (2006) have tested this claim with university students in the Czech Republic. In a balanced within-subjects design, they randomly assigned male students to either a "meat" or "no meat" condition for a period of two weeks. Participants in the meat condition were required to eat at least 100 g of red meat a day, and participants in the nonmeat condition were to refrain from eating red meat. In order to eliminate the possibility that participants in the no meat condition might have increased their consumption of other meats and animal products to compensate for abstaining from red meat, all meals and snacks were prepared and provided to participants during the final four days of each session. Group assignment was reversed for the following two week session. At the end of each two week cycle, participants wore cotton pads for 24 h to collect their body odour. Following each cycle, female students not taking hormonal contraceptives rated the body odour of each participant. Participant body odour when on the non-meat diet was judged to be significantly more attractive, more pleasant, and more intense. Ratings of masculinity, however, did not significantly differ between conditions.

Although vegetarians were once viewed in primarily negative terms, public attitude has shifted considerably, such that they are now viewed as good and principled if a bit weak and feminine (whether the latter is positive or negative depends on the extent to which one does or does not value masculinity). Teenage boys and people high in authoritarianism appear to have more negative views of vegetarianism, as well as people who feel that vegetarians view *them* negatively for eating meat. Among vegetarians and vegans, there is an ongoing debate, in which vegans sometimes accuse vegetarians of being morally inconsistent, refusing to eat meat but eating animal products that are intimately tied to meat production, and some vegetarians defending their diet as more practical and viable. A common thread in the aforementioned studies on perceptions of vegetarians is that they were all conducted in Western countries, with participant samples that were predominantly liberal. What remains to be seen is how vegetarians are perceived in more conservative areas of North America, such as the Canadian Prairies and Midwest, as well as in cultures where vegetarianism is especially common or uncommon, such as India and Portugal (with estimated rates of 40% and 0.3%, respectively; European Vegetarian Union, 2008).

Vegetarianism and gender

One factor that often arises in the literature on meat and vegetarianism is gender. Men and women tend not only to view vegetarianism through very different lenses, but appear to interact with meat on fundamentally different levels. Twigg (1979) argues that meat has long stood as a symbol of man's strength and dominance over

the natural world. The idea that meat is primarily a man's food is found across many cultures, from Africa (Leghorn & Roodkowsky, 1977; O'Laughlin, 1974) and Southeast Asia (Simoons, 1961), to Europe (Fiddes, 1991; O'Doherty, Jensen & Holm, 1999) and North America (Sobal, 2005). Recent research by Rozin et al. (in press) provides a large body of convergent evidence of the link between meat and masculinity. Across an array of studies, participants associated meat and maleness with one another on both word association and Implicit Association Task (IAT) paradigms, and explicitly rated various forms of red meat as particularly "male" foods. Activities related to the acquisition and preparation of food (e.g. shopping, cooking, and serving) are often construed as feminine activities (e.g. Caplan, Keane, Willetts, & Williams, 1998). Indeed, research with men in the UK indicates that, compared to women, they know less about the nutritional properties of the foods they eat (UK Food Standards Agency, 2003), report consuming more high-calorie foods and fewer servings of fruits and vegetables (Baker & Wardle, 2003; Fraser et al., 2000), and are likely to view healthy eating with suspicion, preferring large, "masculine" portions, usually revolving around meat (Gough & Conner, 2006). Furthermore, men are more likely than women to endorse the belief that "a healthy diet should always include meat" (Beardsworth et al., 2002), a pattern which is echoed in a survey of Norwegian adults (Fagerli & Wandel, 1999). Similarly, in a sample of adults in the Midwest United States, women had more positive attitudes than men toward more nutritious meals, rating them as more pleasurable, convenient, and healthy (Rappoport, Peters, Downey, McCann, & Huff-Corzine, 1993), and in a sample of university students in Pennsylvania, women were more likely than men to avoid eating red meat (Rozin et al., in press).

It is, then, unsurprising that vegetarian women greatly outnumber vegetarian men in Western societies (Amato & Partridge, 1989; Beardsworth & Bryman, 1999; Fraser et al., 2000; Neumark-Sztainer, Story, Resnick, & Blum, 1997; Santos & Booth, 1996; Smart, 1995; Worsley & Skrzypiec, 1998) and even among Western non-vegetarians, women eat considerably less meat than men (Beardsworth & Bryman, 1999; Beardsworth et al., 2002; Fraser, Welch, Luben, Bingham, & Day, 2000; Gossard & York, 2003; National Public Health Institute, 1998; Perl, Mandić, Primorac, Klavec, & Perl, 1998; Richardson et al., 1993; Rimal, 2002). Complementing findings on gender differences in rates of vegetarianism, research from Norway and Britain suggests that women are more likely than men to be decreasing their meat consumption (Beardsworth et al., 2002; Fagerli & Wandel, 1999), and among a study of adolescents in the United States, with 48% of 16–17 year old girls finding vegetarianism socially desirable and hip, but only 22% of boys the same age reporting such sentiments (Walker, 1995). Parallel findings emerged among adolescents in South Australia, such that significantly more women than men reported that they would like to be a vegetarian (15% vs 2%) or had considered becoming a vegetarian (40% vs. 9%; Worsley & Skrzypiec, 1998). Gender differences in attitudes toward vegetarianism were also reflected in family relations – adolescents expected the most support in following a vegetarian diet from their mothers, and the least support, or even opposition, from their fathers or older brothers (Worsley & Skrzypiec, 1998).

Gender differences also emerge in the tendency to view vegetarianism through a lens of ethics. In a random sample of adults in the USA, women were more likely than men to endorse the beliefs that a vegetarian diet is less harmful to the environment, helps prevent cruelty to farm animals, and makes more food available and helps reduce problems of hunger than a diet that includes red meat (Kalof et al., 1999). Beardsworth et al. (2002) reported a similar pattern of results in a UK sample: compared to men, women reported less support for using animals for food, greater support for producing food in a way that minimizes animal suffering, and a greater tendency to purchase environmentally friendly products. Examining the 1994 General Social Survey, a probability

sample of English-speaking adults in the United States, Kruse (1999) found that women displayed higher levels of animal rights advocacy than did men, being more in favor of extending of moral rights to non-human animals and being more opposed to the use of non-human animals in medical testing. This sentiment was echoed in a study of New Zealand vegans and vegetarians, in which 65% of women but only 15% of men cited compassion toward non-human animals as a reason for avoiding meat (Potts & White, 2008).

Thus, the present research suggests there are strong associations across many cultures between meat and masculinity, with men and women approaching meat eating in very different manners. Women eat less meat than men, report less liking for it, and consider meatless meals to be more pleasant than do men. Among Westerners, vegetarian women are more concerned with animal welfare than are vegetarian men, and this sentiment is echoed among non-vegetarians, such that women are more likely to report concern with issues of animal welfare and environmental protection, and to view a vegetarian diet in positive terms. Although the associations between meat and masculinity span a broad range of cultures (Adams, 1991; Twigg, 1979), it is an open question how the strength of these associations varies. In societies where meat is relatively scarce, and in those with larger gender inequalities, would the links between meat and masculinity be stronger than in societies where meat is relatively available, and men and women have more equal status? Future research on such possible differences, as well as a deeper investigation of how gender affects the ways in which people interact with meat-eating and vegetarianism, would greatly enrich the literature.

Discussion

Conclusion

In many studies of vegetarianism, there appears to be no universal understanding of the word 'vegetarian,' with the diets of self-defined vegetarians spanning the range of no animal products at all, to occasional inclusion of fish, poultry, and red meat (e.g. Barr & Chapman, 2002; Beardsworth & Keil, 1991b; Beardsworth & Keil, 1992; Krizmanic, 1992; Willetts, 1997), and recent research (e.g. Ruby, 2008; Ruby et al., 2011) demonstrates significant differences between vegetarians and vegans on a broad range of measures. Beyond these differences, one's motivations for being vegetarian, whether primarily for reasons of ethics or health, have a profound impact on one's process of becoming vegetarian, dietary behaviour, and ideology (e.g. Jabs et al., 1998; Rozin et al., 1997). Although several countries carefully track and document the prevalence of vegetarianism, most available statistics are at least several years old, and largely compiled by vegetarian organizations (e.g., European Vegetarian Union, 2008), rather than by governmental or independent polling agencies. Given the rapid increase in the visibility and social acceptability of vegetarianism in recent years, it is likely that a number of the statistics regarding the prevalence of vegetarianism have changed, further underscoring the need to further investigate both the psychology of vegetarianism, as well as changing attitudes and behaviors regarding the use of animal products among people at all points of the dietary spectrum.

With the notable exception of Hussar and Harris's (2009) work on moral reasoning, and Gale et al.'s (2007) study on the relationship between childhood IQ and adult vegetarianism, surprisingly little is known about the psychology of vegetarianism among children, and equally little is known about the differences between those who were raised vegetarian, and those who chose to transition to vegetarianism later in life. Hussar and Harris's research on vegetarianism and moral reasoning among children is an informative, yet very rare contrast to research conducted among adults. As

such, the study of vegetarianism would be greatly enhanced by further investigation among a diverse set of populations, from the juvenile to the elderly, to examine potential differences between vegetarians at different stages of life.

Beyond meat and masculinity, further research in a broader range of cultures is a critical step in better understanding the psychology of vegetarianism. Indeed, as described by Sutton (1997) in his anthropological fieldwork in rural Greece, even within Mediterranean society, perceptions of meat-eating and meat abstention vary wildly, with meat eating being an essential component of masculinity in the mountain villages of the island of Crete, but meat abstention being an admirable display of self-discipline and piety on the island of Kalymnos. The literature suggests that the refusal to eat meat can draw especially intense criticism in historically farm-based cultures where meat is a significant proportion of the GDP (e.g. New Zealand; Potts & White, 2008). Cultural norms and culturally shaped emotions strongly influence an individual's sense of the moral and immoral (Haidt, Koller, & Dias, 1993), with many collectivistic cultures, such as India, displaying a stronger relationship between feelings of disgust and morality judgments (Haidt, Rozin, McCauley, & Imada, 1997). Given the moral components that often underlie the practice of vegetarianism, it would be highly informative to extend the present research to include such collectivistic cultures, especially where vegetarianism is relatively more common and mainstream (e.g., India). By thus expanding the scope of the literature beyond Western, individualistic cultures, the field stands to gain a far more nuanced understanding of the associated psychological phenomena, from motivations for and perceptions of vegetarianism, to intersections with gender and socioeconomic status, to omnivore-vegetarian differences in values, attitudes, and worldviews.

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