



Research report

Compassion and contamination. Cultural differences in vegetarianism[☆]Matthew B. Ruby^{a,*}, Steven J. Heine^b, Shanmukh Kamble^c, Tessa K. Cheng^d, Mahadevi Waddar^c^a University of Pennsylvania, Philadelphia, PA, USA^b University of British Columbia, Vancouver, BC, Canada^c Karnatak University, Dharwad, India^d Simon Fraser University, Vancouver, BC, Canada

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ABSTRACT

A growing body of research has shown that Western vegetarians report more concern for animal welfare and environmental sustainability, and endorse more liberal values than do Western omnivores. However, despite the prevalence of Indian vegetarianism, its psychological associations and underpinnings remain largely unexamined. In Study 1, we find that Euro-American vegetarians are more concerned than omnivores with the impact of their daily food choices on the environment and animal welfare, show more concern for general animal welfare, and endorse universalistic values more, yet among Indian participants, these differences are not significant. In Study 2, we show that Indian vegetarians more strongly endorse the belief that eating meat is polluting, and show a heightened concern for the conservative ethics of Purity, Authority, and Ingroup relative to their omnivorous peers, whereas these differences are largely absent among Euro-Canadians and Euro-Americans.

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Introduction

Humans have historically spent a vast amount of time acquiring, preparing, and consuming food, often following only work and sleeping in percentage of daily time expenditure (Szalai, 1972). Although the consumption of fast food has dramatically increased since the 1970s (e.g., Goyal & Singh, 2007; Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003) reducing time spent in food preparation, a substantial proportion of people's earnings is still spent on food and drink, with recent estimates of total household expenditures on food and drink ranging from 7% in the USA and 10% in Canada, to 28% in India (Meade, 2011). Despite the centrality of food in daily life, the psychology of food and eating (apart from research on obesity and regulation of food intake) is greatly understudied (Rozin, 2007): many of the reasons on which people base their food choices remain unclear. Most humans follow an omnivorous diet, and take advantage of dramatic nutritional flexibility not available to other omnivorous species. However, such flexibility carries risks, such as failing to consume essential nutrients, or ingesting toxins or harmful microbes, a problem that Rozin (1976) has termed "the omnivore's dilemma". Unlike most animals, who instinctively know which foods to eat,

and which to avoid, humans must learn these distinctions, relying heavily on culturally transmitted information (Rozin, 1990). Thus far, the kinds of cultural information that guide food choices are not well understood.

One kind of food that is particularly appropriate for investigating the ways that culture guides food choices is meat. A concentrated source of fat and protein, meat also has a higher risk of containing harmful substances than vegetable foods, and so, across a broad array of cultures, meat is one of the most highly valued foods, and most commonly tabooed foods (Fessler & Navarrete, 2003; Rozin & Fallon, 1987). Although most people avoid eating particular types of animals, a number of individuals avoid eating animals altogether. Recent polls indicate that approximately 8% of Canadians (Ipsos-Reid, 2004), 3% of Americans (Cunningham, 2009), and estimates for India vary between 20% (Goldammer, 2001) and 42% (Delgado, Narrod, & Tiongco, 2003). Although vegetarians are a minority in most cultures, they are not always small minorities, and the popularity of vegetarian diets is on the rise in many countries (Cultivate Research, 2008; Datamonitor, 2009; Mintel International Group, 2007). As such, a growing number of scholars have begun formally studying the psychology of vegetarianism, exploring who vegetarians are, what motivates their dietary choices, and how they differ from omnivores in their politics, attitudes, and worldviews (for a review, see Ruby, 2012). However, as with much of the psychological database (Arnett, 2008), the research on vegetarianism has largely drawn from Western cultures, leaving the cross-cultural generalizability of

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the literature open to question (Henrich, Heine, & Norenzayan, 2010). Despite the fact that there are likely more vegetarians in India than in the rest of the world combined, studies on the psychological underpinnings of vegetarianism have all but ignored Indian cultural contexts. Are the same psychological processes that lead Western vegetarians to abstain from meat also implicated in the food choices of Indian vegetarians?

In Western cultural contexts, vegetarians and omnivores have been shown to view meat in very different terms. Although omnivores usually have positive explicit attitudes toward meat, associating it with luxury, good taste, and social status, vegetarians in the UK, Canada, and Germany tend to associate meat with cruelty, killing, disgust, and poor health (Barr & Chapman, 2002; Kenyon & Barker, 1998; Stockburger, Renner, Weike, Hamm, & Schupp, 2009), and research with Irish and Dutch populations reveals that for many vegetarians, these negative associations are also present on the implicit level (Barnes-Holmes, Murtagh, & Barnes-Holmes, 2010; De Houwer & De Bruycker, 2007). Although research involving vegetarian children is extremely rare, a study of children living in the USA found that child vegetarians framed their own dietary choices in moral terms (Hussar & Harris, 2009).

In contrast to the positive explicit attitudes expressed toward meat, recent research with Western populations indicates that meat-eating is a conflicted behavior that often results in omnivores modifying their perception of animals' moral status and capacity for emotion to be congruent with their behavior. Bratanova, Loughnan, and Bastian (2011) found that simply classifying an animal as a food source led participants to rate the animal as significantly less capable of suffering, and subsequently less deserving of moral status. Relatedly, Loughnan, Haslam, and Bastian (2010) found that randomly assigning participants to eat beef jerky led participants to report less concern for cows, consider them less capable of suffering, and less worthy of moral status, than those participants randomly assigned to eat nuts. People have been shown to attribute diminished mental capabilities to commonly eaten animals, and reminders of the link between meat eating and animal suffering leads to further demoralization of animals (Bastian, Loughnan, Haslam, & Radke, 2012). Furthermore, whereas omnivores have been found to ascribe less capacity for secondary emotions (e.g., hope, love, guilt) to 'edible' animals than to 'inedible' animals, vegetarians did not differentiate between these categories of animals (Bilewicz, Imhoff, & Drogosz, 2011).

In addition to holding different attitudes toward meat, several studies provide convergent evidence that Western vegetarians and omnivores differ more broadly in terms of other kinds of values, with liberal values more associated with vegetarians and conservative values more associated with omnivores. In a study of British adults, vegetarians were more likely than omnivores to be employed in charitable organizations, local government, or education, and were more likely to favor governmental redistribution of income (Gale, Deary, Schoon, & Batty, 2007), and among American adults, vegetarians were more likely to endorse universalistic values (e.g., peace, equality, and social justice; Dietz, Frisch, Kalof, Stern, & Guagnano, 1995). Similar results were obtained with New Zealanders, such that those with a more pronounced omnivore identity more strongly endorsed Right-Wing Authoritarianism (Allen, Wilson, Ng, & Dunne, 2000), and research with Dutch samples indicates that vegetarians report more concern than omnivores about the ecological consequences of their food choices (Hoek, Luning, Stafleu, & Graaf, 2004). Compared to omnivores, vegetarians in the UK reported greater opposition to capital punishment, and this anti-violence stance was especially strong among ethically-motivated vegetarians (Hamilton, 2006). Similarly, among Americans, vegetarians report greater human-directed empathy than omnivores (Preylo & Arikawa, 2008), and among Italians, ethically-motivated vegetarians reported more concern

for human suffering, and showed increased recruitment of empathy-related areas of the brain when viewing scenes of human (and animal) suffering (Filippi et al., 2010).

Given the growing body of research that links Western vegetarianism with broadly liberal worldviews, it would be informative to more closely examine the moral intuitions of vegetarians and omnivores, and see whether the same intuitions guide food choices across different cultural contexts. One potential area of inquiry is Moral Foundation Theory (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007), which holds that people's moral intuitions can be largely contained in five major domains. The ethics of Harm and Fairness, related to the ethic of Autonomy proposed by Shweder, Much, Mahapatra, and Park (1997), are concerned with the extent to which one's actions directly harm or help another, and whether one behaves in a fair manner that respects the rights of others. These two domains were the major focus of the founder of moral psychology, Lawrence Kohlberg (1969), and continued to be the main domains of concern for subsequent leading theories on morality, such as Gilligan's (1982) Moral Development Theory and Turiel's (1983) Social Domain Theory. In stark contrast to these theories of moral psychology, Moral Foundation Theory also considers the ethics of Ingroup, Authority, and Purity to be major domains of moral concern. The ethics of Ingroup and Authority, extensions of the ethic of Community (Shweder et al., 1997), are concerned with the extent to which one's actions show loyalty or disloyalty to one's group, and whether one displays respect for authority, hierarchy and tradition, whereas the ethic of Purity, a corollary of the ethic of Divinity (Shweder et al., 1997), is concerned with the extent to which one's actions follow the perceived 'natural order' and religious laws. Recent research has indicated that American liberals value the ethics of Harm and Fairness more than the ethics of Ingroup, Authority, and Purity, whereas American conservatives value all five ethics to relatively the same extent (Graham et al., 2009; Haidt & Graham, 2007). To what extent might omnivores and vegetarians differ in their endorsement of the moral foundations?

Historically, vegetarianism in the West has been a countercultural dietary practice, traditionally associated with concerns about the killing of animals (Joy, 2009; Rozin, 2004; Stuart, 2006; Twigg, 1979), and in more recent years, concern for personal health and environmental sustainability have become common motivations (Beardsworth & Keil, 1991a; Fox & Ward, 2008; Rozin, Markwith, & Stoess, 1997; Whorton, 1994). Most vegetarians in the West were not raised as such, but made a decision at some point to convert from the meat-eating diet followed by the majority of people in their culture (Beardsworth & Keil, 1991b). As such, the past research suggests that Western vegetarians would be more concerned than their omnivorous peers with the ethics of Harm and Fairness, and less concerned with the ethic of Authority. Because vegetarians are a minority group in the West, one might expect them to be more concerned with their ingroup. However, given that vegetarianism is an ideological identity than can sometimes lead to marginalization (e.g., Kellman, 2000; Monin, 2007), that motivations for becoming vegetarian are diverse (for a review, see Ruby, 2012), and that vegetarians may not be well connected to one another (e.g., Jabs, Devine, & Sobal, 1998), group cohesiveness is difficult to predict. Furthermore, given that vegetarians are also typically more liberal than their omnivorous peers, and liberals typically endorse the ethic of Ingroup less than do conservatives, we did not have a clear prediction regarding differences between Western vegetarians and omnivores in their endorsement of the ethic of Ingroup. Furthermore, as vegetarianism is rarely motivated by religion in Western cultural contexts, vegetarians and omnivores also should not significantly differ in their endorsement of the ethic of Purity.

Turning to other cultural contexts, the history of vegetarianism is markedly different. In India, there is no general consensus on the

prevalence of vegetarianism, with estimates ranging from 244 million (Goldammer, 2001) to 512 million people (Delgado et al., 2003). Despite this large population (as comparison, the estimated population of the European Union is 504 million; Eurostat, 2012), the literature is all but mute on the psychological processes underpinning the avoidance of meat in India. The anthropological literature notes that vegetarianism has been firmly established in India for centuries, and is associated with tradition, power, and status (Preece, 2008; Spencer, 1993). Furthermore, rather than choosing to transition at some point from an omnivorous diet, most Indian vegetarians are raised as such by their families. Given this, it follows that Indian vegetarians would likely be more concerned with the ethic of Authority than their omnivorous counterparts. Historically, vegetarianism in India has chiefly been motivated by religious beliefs, primarily Hinduism and Jainism (Preece, 2008; Spencer, 1993). Jainism places a strong emphasis on the principle of *ahimsa*, or 'non-harming', but has far fewer adherents than does Hinduism (0.4% vs 80.5% of the Indian population, Census of India, 2001). Although Hinduism promotes a belief in reincarnation, such that the "soul" of an animal may have once been a human soul, Hindu vegetarianism has been chiefly concerned with asceticism and purity, such that the aim of vegetarianism is not so much to promote animal welfare, but rather to keep the body free of the pollution associated with meat (Caplan, 2008; Preece, 2008; Spencer, 1993). As such, it is likely that Indian vegetarians would be more religious, and more concerned with the ethic of Purity than their omnivorous counterparts. Given the historical associations of Indian vegetarianism with dominant social groups, Indian vegetarians may be more concerned with the ethic of Ingroup than their omnivorous peers.

Past research among Western populations has revealed that many people change their rationale for vegetarianism over time, later modifying, adding, and sometimes dropping motives (Beardsworth & Keil, 1992; Hamilton, 2006). As such, one could predict that Indian vegetarians might originally adhere to their diets for reasons of religion and tradition, and later become more concerned with animal welfare, environmental sustainability, and the ethics of Harm and Fairness. However, work by Rozin et al. (1997) suggests that one's initial reasons for vegetarianism are highly predictive of one's subsequent motivations, such that those vegetarians initially motivated by concern for animal welfare tend to later adopt a greater number of motivations for vegetarianism than those initially motivated by concern for personal health. It could very well be the case that those who adopt a vegetarian diet for reasons not broadly embraced by the culture (e.g., concern for animal welfare) might feel the need to provide a greater number of justifications for their diet than those who adopt a vegetarian diet primarily for reasons embraced by the culture (e.g., concern for personal health). As such, initial concerns for religion, tradition, and purity among Indian vegetarians, which are concordant with dominant cultural systems, might not later translate into heightened concern for animals and the environment. However, despite the longstanding prevalence of vegetarianism in India, its attitudinal and moral underpinnings remain largely unexamined.

Given the often problematic nature of direct cross-cultural comparisons of responses to Likert scales (because people in one culture may compare themselves with different peers and standards than do people in another culture; Heine, Lehman, Peng, & Greenholtz, 2002), in both studies we focused on comparisons between dietary groups within cultures. In Study 1 we hypothesized that, relative to omnivores, Euro-American vegetarians would be more concerned about the impact of their daily food choices on the environment and on animal suffering, and more concerned with general animal welfare (e.g., concern about the use of animals for research, pet breeding practices, confinement in zoos), but that these differences would be much less pronounced among Indian

vegetarians and omnivores. Furthermore, we hypothesized that Euro-American vegetarians would report more support for universalistic values and less support for Right-Wing Authoritarianism, but that these differences would not be significant among Indians. In Study 2, we hypothesized that although vegetarians would be more likely than omnivores to endorse the belief that eating meat is polluting, this difference would be especially pronounced among Indians. Furthermore, we predicted higher self-reported religiosity and a heightened concern with the ethics of Purity, Authority, and Ingroup among Indian vegetarians, but not among Euro-Canadian and Euro-American vegetarians.

Study 1

Methods

Participants

As part of a larger study on the relationship between people's dietary choices and their attitudes toward social issues, 272 omnivore and vegetarian participants were recruited from Amazon.com's Mturk testing service, (an online, inexpensive, and reliable source of data; Buhrmeister, Kwang, & Gosling, 2011). 159 participants were Euro-Americans (65% Women, $M_{age} = 36.6$, $SD_{age} = 14.27$, 145 omnivores, 14 vegetarians), and 113 were Indians (40% Women, $M_{age} = 29.1$, $SD_{age} = 8.11$, 66 omnivores, 47 vegetarians).¹ Participants were each paid a small honorarium. There were significant cultural differences in both age, $F(1,269) = 25.31$, $p < .001$, and gender, $\chi^2(1) = 16.59$, $p < .001$.

Materials

Participants completed demographic measures and indicated their dietary status (e.g., omnivore or vegetarian) and how many times per week they ate various foods (e.g., poultry, beef, pork, fish, rice, vegetables). Those who self-identified as omnivores and ate animal flesh at least once a week were categorized as omnivores, and those who identified as vegetarians and did not consume animal flesh were categorized as vegetarians. Participants also completed the Ecological Welfare subscale (Lindeman & Väänänen, 2000), which measures people's concern for the impact of their diet on the environment (3 items) and animal welfare (2 items) on a 4 point scale (1 = not at all important, 4 = very important). To measure broader attitudes toward animals welfare, beyond the domain of food, participants completed the Animal Attitudes Scale (Herzog, Betchart, & Pittman, 1991), a 20 item scale that measures one's general opinions about animal welfare (e.g., "The use of animals in rodeos and circuses is cruel," "I sometimes get upset when I see wild animals in cages at zoos") on a 5 point scale (1 = strongly disagree, 5 = strongly agree). Participants also completed Altemeyer's (1981) Right Wing Authoritarianism Scale, a 24 item scale that measures one's opinions about Right-Wing Authoritarianism (e.g., "Obedience and respect for authority are the most important virtues children should learn," "Our customs and national heritage are the things that have made us great, and certain people should be made to show greater respect for them") on a 7 point scale (-3 = strongly disagree, 0 = neutral, 3 = strongly agree). Finally, participants completed the Portrait Value Questionnaire (Schwartz et al., 2001), which assesses the extent to which, on a six point scale (1 = not at all, 6 = very much), people hold different values in esteem (e.g., security, conformity, universalism, hedonism). Scores for each value subscale are centered around each individual's mean response, to indicate the relative importance of that

¹ An additional 32 omnivore and 3 vegetarian participants of a variety of other ethnicities were excluded from analysis, as they did not form any substantial cultural sub-groups.

Table 1

Means and standard deviations of omnivore and vegetarian concern for the impact of daily food choices on the environment, animal welfare, Animal Attitudes, and endorsement of Right-Wing Authoritarianism and Universalism.

	Euro-American		Indian	
	Omnivore	Vegetarian	Omnivore	Vegetarian
Ecological Welfare	2.62 (.97)	3.56 (.62)	3.20 (.71)	3.21 (.85)
Animal Welfare	2.50 (1.03)	3.34 (1.08)	2.83 (.84)	3.07 (.88)
Animal Attitudes	64.26 (14.53)	80.32 (15.77)	61.92 (8.64)	65.06 (11.55)
Right-Wing Authoritarianism	-4.79 (26.39)	-26.86 (25.23)	6.14 (11.39)	5.29 (10.35)
Universalism	4.46 (.75)	5.07 (.86)	4.17 (.49)	4.29 (.56)

value to the individual. Building on the findings of Dietz et al. (1995), we were interested in differences in the Universalism subscale (e.g., “All the world’s people should live in harmony,” “It is important to protect the weak in society”). All measures were administered in English. All measures had high internal reliability within the Euro-American sample (environmental impact, $\alpha = .94$; animal welfare, $\alpha = .95$; Animal Attitudes, $\alpha = .92$; Right-Wing Authoritarianism, $\alpha = .93$; Universalism, $\alpha = .85$), as did all measures except Right-Wing Authoritarianism within the Indian sample (environmental impact, $\alpha = .88$; animal welfare, $\alpha = .87$; Animal Attitudes, $\alpha = .79$; Right-Wing Authoritarianism, $\alpha = .54$; Universalism, $\alpha = .81$). Following van de Vijver and Leung (1997), we computed Tucker’s phi for each scale to measure the degree with which the scales had similar factor structure across cultural groups. For all scales, comparisons between the two cultural groups yielded Tucker’s phi coefficients above .95, which van de Vijver and Leung (1997) argue provides evidence for factorial similarity. Right Wing Authoritarianism had a Tucker’s phi coefficient of .84, which indicates non-negligible incongruities (van de Vijver and Leung, 1997). Given this, and the very low Cronbach’s alpha within the Indian sample, the results of that variable should be interpreted with caution.

Results

To test our hypotheses, we conducted a series of 2 (diet) X 2 (culture) ANCOVAs, controlling for participant age and gender.² First, we conducted an ANCOVA on people’s concerns of the environmental impact of their food choices. The main effect of diet was significant, $F(1,260) = 10.62$, $p < .001$, $d = .56$, such that vegetarians reported greater concern ($M = 3.40$, $SD = 0.81$) than did omnivores ($M = 2.91$, $SD = 0.94$). The main effect of culture was not significant, $F(1,260) = 1.53$, $p = .22$, however, the predicted interaction between diet and culture was significant, $F(1,260) = 9.74$, $p < .003$ (see Table 1). Analysis of simple effects revealed that the difference between vegetarians and omnivores in concern for the impact of their food choices on the environment was significant among Euro-Americans ($p < .001$, $d = 1.16$), but not among Indians ($p = .92$, $d = .02$).

Next, we conducted an ANCOVA on people’s concerns of the impact of their food choices on animal welfare. The main effect of diet was significant, $F(1,260) = 11.67$, $p < .001$, $d = .59$, such that vegetarians reported greater concern ($M = 3.23$, $SD = 0.93$) than did omnivores ($M = 2.67$, $SD = 0.98$). The main effect of culture was not significant, $F(1,260) = 0.62$, $p = .43$, but the predicted interaction between diet and culture was marginally significant, $F(1,260) = 3.43$, $p = .06$. Analysis of simple effects revealed that the difference between vegetarians and omnivores in concern for the impact of their food choices on animal welfare was significant among Euro-Americans ($p < .004$, $d = .80$), but not among Indians ($p = .16$, $d = .28$).

Next, we conducted an ANCOVA on Animal Attitudes. The main effect of diet was significant, $F(1,261) = 20.75$, $p < .001$, $d = .73$,

such that vegetarians reported greater overall concern for animal welfare ($M = 73.07$, $SD = 14.26$) than did omnivores ($M = 63.15$, $SD = 13.03$). The main effect of culture was significant, $F(1,261) = 11.41$, $p < .001$, $d = 1.23$, with Euro-Americans endorsing these items more than Indians, as was the hypothesized interaction between diet and culture, $F(1,261) = 9.19$, $p < .003$. Analysis of simple effects revealed that the difference between vegetarians and omnivores in overall concern for animal welfare was significant among Euro-Americans ($p < .001$, $d = 1.06$), but not among Indians ($p = .11$, $d = .31$).

Next, we conducted an ANCOVA on Right-Wing Authoritarianism. The main effect of diet was significant, $F(1,265) = 10.46$, $p < .001$, $d = .54$, such that vegetarians scored lower on Right-Wing Authoritarianism ($M = -10.80$, $SD = 19.96$) than did omnivores ($M = 0.94$, $SD = 23.36$). The main effect of culture was also significant, $F(1,265) = 36.37$, $p < .001$, $d = 1.11$, with Indians endorsing these items more than Euro-Americans. As predicted, the interaction between diet and culture was significant, $F(2,265) = 7.92$, $p < .01$. Analysis of simple effects revealed that the difference between vegetarians and omnivores in Right-Wing Authoritarianism was significant among Euro-Americans ($p < .004$, $d = .85$), but not among Indians ($p = .70$, $d = .08$). However, as we noted earlier, this scale had a low Tucker’s phi coefficient and a very low Cronbach’s alpha among the Indian sample, so these effects should be interpreted with caution.

Next, we conducted an ANCOVA on Universalism. The main effect of diet was significant, $F(1,264) = 9.49$, $p < .001$, $d = .49$, such that vegetarians scored higher on Universalism ($M = 4.68$, $SD = 0.73$) than did omnivores ($M = 4.33$, $SD = 0.69$). The main effect of culture was significant, $F(1,264) = 16.43$, $p < .003$, $d = .72$, with Euro-Americans endorsing these items more than Indians, as was the predicted interaction between diet and culture, $F(1,264) = 5.57$, $p < .02$. Analysis of simple effects revealed that the difference between vegetarians and omnivores in Universalism was significant among Euro-Americans ($p < .005$, $d = .75$), but not among Indians ($p = .25$, $d = .23$).

Finally, we computed correlations between all of the dependent variables within each cultural group, to provide the reader of a visual overview of these relationships (see Table 2).

Discussion

Study 1 provides initial evidence that the differences in attitudes and values between vegetarians and omnivores in North America may not exist to the same extent in Indian cultural contexts. As predicted, vegetarians were more concerned about the impact of their daily food choices on the environment and on animal welfare, more concerned with general animal welfare, more strongly endorsed values of universalism, and less strongly endorsed Right-Wing Authoritarianism, yet this difference was significant only among Euro-American participants. Notably, although the omnivore-vegetarian differences in animal attitudes, concern for animal welfare, and endorsement of universalism were not significant within our Indian sample, the effect sizes ranged

² If we do not control for age and gender, the overall pattern of our findings remains unchanged.

Table 2

Correlations with each cultural group between concern for the impact of daily food choices on the environment, animal welfare, Animal Attitudes, Right-Wing Authoritarianism, and Universalism.

	1	2	3	4	5
<i>Euro-Americans</i>					
1. Ecological Welfare		.84***	.54***	-.19*	.38***
2. Animal Welfare			.61***	-.14	.352***
3. Animal Attitudes				-.24**	.42***
4. Right-Wing Authoritarianism					-.54***
5. Universalism					
<i>Indians</i>					
1. Ecological Welfare		.58***	.16	.27**	.28**
2. Animal Welfare			.34***	.08	.18
3. Animal Attitudes				.19	.28**
4. Right-Wing Authoritarianism					-.04
5. Universalism					

Note.

*** $p < .001$.

** $p < .01$.

from .23 to .31, suggesting that a larger sample might indicate small yet significant differences in these domains.

Although this study's pattern of results was broad and robust, it would be more informative to demonstrate particular ways in which vegetarians and omnivores differ within Indian cultural contexts. Thus, in Study 2, we hypothesized that vegetarians would endorse the belief that eating meat is polluting more than would omnivores, and that this belief would be especially pronounced among Indian vegetarians. Also, we hypothesized that Indian vegetarians would be more religious than their omnivorous peers, and would demonstrate more concern with the ethic of Purity, but that North American omnivores and vegetarians would not significantly differ in either religiosity or endorsement of the ethic of Purity. Given the associations of vegetarianism with counterculture in the West, but with tradition and status in India, we predicted that among North Americans, vegetarians would endorse the ethic of Authority less than omnivores, whereas among Indians, the opposite pattern would emerge. Given the associations of Indian vegetarianism with dominant social groups, we predicted that Indian vegetarians would endorse the ethic of Ingroup more than would omnivores. Because vegetarians in the West are typically more liberal than their omnivorous peers, yet are also members of an ideological minority group with diverse motivations and varying degrees of social connection to one another, we did not have a clear prediction regarding differences between Western vegetarians and omnivores in their endorsement of the ethic of Ingroup. Although the other moral foundations were not central to our inquiry, given previous differences in concern for animal welfare, peace, and social justice, we also predicted that vegetarians would endorse the ethics of Harm and Fairness more than omnivores, especially among North Americans.

Study 2

Method

Participants

As part of a larger study on the relationship between people's dietary choices and their attitudes toward social issues, we recruited a total of 828 omnivore and vegetarian participants from four different groups. We recruited 106 Euro-Canadians (60% Women, $M_{age} = 25.4$, $SD_{age} = 8.69$, 91 omnivores, 15 vegetarians; 46% Atheist/Agnostic, 20% Christian, 1% Jewish, 7% Other, 26% Unspecified) from a large research university in Western Canada and via postings in online vegetarian groups (e.g., Earthsave,

Urbanspoon), and 266 Euro-Americans (64% Women, $M_{age} = 35.7$, $SD_{age} = 12.94$, 245 omnivores, 21 vegetarians; 38% Atheist/Agnostic, 40% Christian, 1% Jewish, 8% Other, 12% Unspecified) via postings in online vegetarian groups and from Amazon.com's Mturk testing service.³ As it is possible that Indian participants recruited via Mturk may be more westernized than their peers, we recruited two separate groups of Indian participants—256 Indians from Mturk (33% Women, $M_{age} = 29.3$, $SD_{age} = 8.62$, 184 omnivores, 72 vegetarians; 16% Christian, 65% Hindu, 9% Muslim, 3% Other, 9% Unspecified), as well as a separate group of 200 Indians from a small university in Karnataka State, India (51% Women, $M_{age} = 25.4$, $SD_{age} = 3.01$, 96 omnivores, 104 vegetarians; 11% Christian, 80% Hindu, 8% Muslim, 1% Unspecified). Participants from Mturk were each paid a small honorarium, other online participants were entered into a cash draw, and in line with the local cultural norms, participants at the Indian university completed the survey on a voluntary basis. There were significant cultural differences in both age, $F(3,824) = 56.91$, $p < .001$, and gender, $\chi^2(3) = 54.31$, $p < .001$.

Materials

Participants completed demographic measures and indicated their dietary status in the same manner as in Study 1. To measure the belief that eating meat pollutes one's personality and spirit, participants indicated, on a nine-point scale (−4 = disagree very much, 0 = neither agree nor disagree, 4 = agree very much), their agreement/disagreement with the following four items: "Eating meat makes me behave like an animal", "Killing and eating animals makes it easier for us to be aggressive and violent", "Eating meat causes undesirable changes in a person's personality", and "Eating meat is spiritually polluting" (from Rozin et al., 1997). Participants indicated their religiosity on a seven-point scale (1 = Not at all religious, 7 = Extremely religious). Furthermore, participants also indicated how relevant a series of 22 considerations associated with the Five Moral Foundations (from Graham et al., 2009, Study 2) were when deciding whether something is right or wrong. Sample items from the measure include: *Purity* (e.g., "whether or not someone violated standards of purity and decency", "whether or not someone did something unnatural or degrading"), *Authority* (e.g., "whether or not someone showed a lack of respect for legitimate authority"; "whether or not someone respected the traditions of society"), *Ingroup* (e.g., "whether or not someone did something to betray his or her group", "whether or not the action was done by a friend or relative of yours"), on a six point scale (1 = never relevant, 6 = always relevant), *Harm* (e.g., "whether or not someone was harmed", "whether or not someone used violence"), and *Fairness* (e.g., "whether or not some people were treated differently than others", "whether or not someone was denied his or her rights"). All materials were administered in English. All measures had excellent internal reliability (see Table 3). For all scales, comparisons between the four cultural groups yielded Tucker's phi coefficients above .95.

Results

To test our hypotheses, we conducted a series of 2 (diet) × 4 (culture) ANCOVAs (the two Indian samples were examined separately), controlling for participant age and gender.⁴ First, we conducted an ANCOVA on endorsement of the belief that eating meat

³ An additional 96 omnivore and 4 vegetarian participants of a variety of other ethnicities were excluded from the Canadian sample, and an additional 103 omnivore and 12 vegetarian participants of a variety of other ethnicities were excluded from the American sample, as they did not form any substantial cultural sub-groups.

⁴ If we do not control for age and gender, the overall pattern of our findings remains unchanged, save that the main effect of diet on Ingroup ($p = .09$) and the main effect of culture on Fairness ($p = .06$) become marginal.

Table 3

Cronbach's alpha values for each cultural group for meat pollution beliefs and concern for the Five Moral Foundations.

	Euro-Canadian	Euro-American	Indian (Mturk)	Indian (Karnataka)
Meat Pollution	.81	.89	.93	.94
Purity	.88	.87	.86	.90
Authority	.82	.82	.81	.90
Ingroup	.87	.88	.85	.89
Harm	.83	.87	.90	.92
Fairness	.80	.84	.84	.89

is polluting. The main effect of diet was significant, $F(1,814) = 247.06$, $p < .001$, $d = 1.34$, such that vegetarians endorsed the belief that eating meat is polluting more ($M = 0.23$, $SD = 2.48$) than did omnivores ($M = -2.70$, $SD = 1.83$). The main effect of culture was also significant, $F(3,814) = 47.53$, $p < .001$, with both Indian samples endorsing these items more than Euro-Canadians and Euro-Americans. As hypothesized, the interaction between diet and culture was also significant, $F(3,814) = 28.53$, $p < .001$ (see Table 4). Analysis of simple effects revealed that among both Mturk ($p < .001$, $d = 1.46$) and Karnataka Indians ($p < .001$, $d = 2.65$), vegetarians endorsed the belief that eating meat is polluting more than did omnivores. This difference between the dietary groups was also significant, but less pronounced, among Euro-Canadians ($p < .001$, $d = .88$) and Euro-Americans ($p < .001$, $d = .99$).

Next, we conducted an ANCOVA on religiosity. The main effect of diet was significant, $F(1,813) = 4.02$, $p < .05$, $d = .18$, such that vegetarians were more religious ($M = 3.95$, $SD = 1.72$) than omnivores ($M = 3.60$, $SD = 2.07$). The main effect of culture was significant, $F(3,813) = 79.14$, $p < .001$, with both Indian samples being more religious than the Euro-Canadians and Euro-Americans, as was the predicted interaction between diet and culture, $F(3,813) = 3.19$, $p < .03$. Analysis of simple effects revealed that among both Mturk ($p < .005$, $d = .43$) and Karnataka Indians ($p < .001$, $d = .64$), vegetarians were more religious, but the dietary groups did not significantly differ among Euro-Canadians ($p = .23$, $d = .33$) or Euro-Americans ($p = .21$, $d = .31$).

Next, we conducted an ANCOVA on endorsement of the ethic of Purity. The main effect of diet was significant, $F(1,816) = 15.57$, $p < .001$, $d = .39$, with vegetarians endorsing this ethic more ($M = 4.06$, $SD = 1.28$) than omnivores ($M = 3.57$, $SD = 1.26$). The main effect of culture was also significant, $F(3,816) = 15.22$, $p < .001$, with both Indian samples endorsing these items more than Euro-Canadians and Euro-Americans, as was the predicted interaction between diet and culture, $F(3,816) = 27.509$, $p < .001$. Analysis of simple effects revealed that among both Mturk ($p < .001$, $d = .52$) and Karnataka Indians ($p < .001$, $d = 1.81$), vegetarians endorsed the ethic of Purity significantly more than omnivores, but the dietary groups did not significantly differ among Euro-Canadians ($p = .56$, $d = .14$) or Euro-Americans ($p = .12$, $d = .41$).

Next, we conducted an ANCOVA on endorsement of the ethic of Authority. The main effect of diet was significant, $F(1,816) = 11.26$, $p < .002$, $d = .32$, with vegetarians endorsing this ethic more ($M = 3.92$, $SD = 1.28$) than omnivores ($M = 3.53$, $SD = 1.14$). The main effect of culture was also significant, $F(3,816) = 18.39$, $p < .001$, with both Indian samples endorsing these items more than the Euro-Canadians and Euro-Americans, as was the hypothesized interaction between diet and culture, $F(3,816) = 27.83$, $p < .001$. Analysis of simple effects revealed that among both Mturk ($p < .01$, $d = .43$) and Karnataka Indians ($p < .001$, $d = 1.52$), vegetarians endorsed the ethic of Authority significantly more than omnivores. Among Euro-Americans, however, vegetarians endorsed it marginally less than omnivores ($p = .07$, $d = .43$), and among Euro-Canadians, the dietary groups did not significantly differ ($p = .39$, $d = .21$).

Next, we conducted an ANCOVA on endorsement of the ethic of Ingroup. The main effect of diet was significant, $F(1,816) = 22.09$, $p < .001$, $d = .48$ such that vegetarians endorsed the ethic of Ingroup more ($M = 4.32$, $SD = 1.16$) than did omnivores ($M = 3.75$, $SD = 1.21$). The main effect of culture was also significant, $F(2,816) = 6.86$, $p < .001$, with both Indian samples endorsing these items more than Euro-Americans, as was the interaction between diet and culture, $F(3,816) = 13.99$, $p < .001$. Analysis of simple effects revealed that among both Mturk ($p < .001$, $d = .49$) and Karnataka Indians ($p < .001$, $d = 1.43$), vegetarians endorsed the ethic of Ingroup significantly more than omnivores. Among both Euro-Americans ($p = .82$, $d = .06$) and Euro-Canadians ($p = .97$, $d = .00$), the dietary groups did not significantly differ.

Next, we conducted an ANCOVA on endorsement of the ethic of Harm. The main effect of diet was significant, $F(1,816) = 49.11$, $p < .001$, $d = 1.71$, such that vegetarians endorsed the ethic of Harm more ($M = 5.46$, $SD = .87$) than did omnivores ($M = 3.56$, $SD = 1.31$). The main effect of culture was also significant, $F(3,816) = 4.68$, $p < .01$, with Euro-Canadians and Euro-Americans endorsing these items more than both Indian samples, as was the interaction between diet and culture, $F(3,816) = 15.94$, $p < .001$. Analysis of simple effects revealed that, contrary to our expectations, the difference between vegetarians and omnivores in endorsement of the ethic of Harm was significant among both Mturk ($p < .001$, $d = .85$) and Karnataka Indians ($p < .001$, $d = 1.46$), and marginally significant among Euro-Americans ($p = .06$, $d = .44$), but not significant among Euro-Canadians ($p = .91$, $d = .03$).

Next, we conducted an ANCOVA on endorsement of the ethic of Fairness. The main effect of diet was significant, $F(1,816) = 30.70$, $p < .001$, $d = 1.12$, such that vegetarians endorsed the ethic of Fairness more ($M = 4.94$, $SD = 1.51$) than did omnivores ($M = 4.27$, $SD = 1.18$). The main effect of culture was significant, $F(3,816) = 2.88$, $p < .04$, with the Mturk Indians endorsing these items less than the Karnataka Indians, as was the interaction between diet and culture, $F(3,816) = 4.72$, $p < .004$. Analysis of simple effects revealed that, contrary to our expectations, the difference between vegetarians and omnivores in endorsement of the ethic

Table 4

Means and standard deviations of omnivore and vegetarian meat pollution beliefs, religiosity, and concern for the Five Moral Foundations.

	Euro-Canadian		Euro-American		Indian (Mturk)		Indian (Karnataka)	
	Omnivore	Vegetarian	Omnivore	Vegetarian	Omnivore	Vegetarian	Omnivore	Vegetarian
Meat Pollution	-3.27 (1.11)	-1.73 (2.22)	-3.16 (1.46)	-1.41 (2.03)	-1.76 (1.96)	1.34 (2.28)	-2.61 (2.24)	2.69 (1.73)
Religiosity	2.12 (1.51)	2.65 (1.69)	2.86 (1.94)	2.31 (1.58)	4.59 (1.84)	5.30 (1.46)	4.73 (1.62)	5.60 (1.01)
Purity	3.56 (1.19)	3.35 (1.69)	3.60 (1.34)	3.13 (.89)	3.85 (1.10)	4.38 (.95)	3.21 (1.29)	5.32 (1.03)
Authority	3.56 (.91)	3.32 (1.31)	3.45 (1.10)	3.00 (1.01)	3.82 (1.08)	4.24 (.88)	3.20 (1.42)	5.16 (1.15)
Ingroup	3.90 (1.03)	3.91 (1.36)	3.67 (1.27)	3.74 (.97)	3.88 (1.08)	4.39 (1.01)	3.50 (1.36)	5.23 (1.03)
Harm	4.94 (.83)	4.91 (1.12)	4.88 (.98)	5.29 (.88)	4.12 (1.28)	5.04 (.84)	3.44 (1.69)	5.39 (.83)
Fairness	4.55 (.88)	4.73 (.85)	4.47 (1.04)	4.98 (.65)	4.05 (1.21)	4.64 (.83)	3.92 (1.50)	5.22 (1.18)

of Fairness was significant among both Mturk ($p < .001$, $d = .60$) and Karnataka Indians ($p < .001$, $d = .96$), as well as Euro-Americans ($p < .03$, $d = .59$), but was not significant among Euro-Canadians ($p = .48$, $d = .21$).

Finally, we computed correlations between all of the dependent variables within each cultural group, to provide the reader of a visual overview of these relationships (see Table 5).

Discussion

As predicted, vegetarians more strongly endorsed the belief that eating meat pollutes one's personality and spirit than did omnivores, and this difference was especially pronounced among Indians. Also as hypothesized, Indian vegetarians were more religious and endorsed the ethic of Purity more than did their omnivorous counterparts, but the difference between dietary groups was not significant among Euro-Canadians and Euro-Americans. Likewise, Indian vegetarians endorsed the ethic of Authority more than did their omnivorous counterparts, yet among Euro-Americans, vegetarians endorsed this value less, and among Euro-Canadians, the difference between dietary groups was not significant. Furthermore, vegetarians endorsed the ethic of Ingroup more than did omnivores within both Indian samples, but did not differ in their ratings within the Euro-Canadian and Euro-American samples. In all four cultural groups, vegetarians endorsed the ethics of Harm and Fairness more than omnivores, with the curious exception of Euro-Canadian omnivores and vegetarians equally endorsing these ethics. Overall, the average effect size of vegetarian-omnivore dif-

ferences among those Indian participants recruited from a university setting ($d = 1.50$) was more than double the effect size among those participants recruited via Mturk ($d = .68$).

General discussion

Across two studies, we have provided evidence the psychological underpinnings of vegetarianism are markedly different in Euro-American and Indian cultural contexts. As with past research conducted in the West, we found that Euro-American vegetarians were more concerned with the impact of their daily food choices on the environment and animal welfare, were more concerned with overall animal welfare, and more strongly endorsed universalistic values of peace, equality, and social justice than did their omnivorous counterparts, and less strongly endorsed the ethic of Authority (e.g., showing respect for authority, fulfilling the duties of one's role, and respecting the traditions of society) than did their omnivorous peers.

In contrast, Indian vegetarians did not differ from their omnivorous counterparts in reported concern for the environment, animal welfare, or universalism, but were more religious, more strongly endorsed the idea that eating meat pollutes one's spirit and personality, and more strongly endorsed the ethics of Purity (e.g., attending to disgust, standards of decency, virtue, and keeping one's desires under control), Authority (e.g., respecting legitimate authority, respecting tradition), and Ingroup (e.g., attending to the interests of one's group, giving friends and family different moral consideration). Among our Euro-Canadian participants, the only significant difference was that vegetarians more strongly endorsed the belief that eating meat is polluting than did their omnivorous peers, suggesting that they share more common views than do vegetarians in American and Indian cultural contexts. In sum, although Indian and North American vegetarians display similar eating behavior, this behavior appears to be driven by distinctly different moral and attitudinal forces.

Although North Americans and Indians varied considerably in several domains, we found evidence for similar omnivore-vegetarian differences in concern for other ethical domains, such that vegetarians in all cultural groups except Euro-Canadians placed more weight than their omnivorous counterparts on the ethics of Fairness (e.g., treating others equally, recognizing people's rights) and Harm (e.g., avoiding harm, caring for the vulnerable). Although this suggests that Indian vegetarians pay more attention than their omnivorous peers to whether others are being harmed or treated unfairly, Study 1 suggests that this elevated concern may not extend to non-human animals. These differences have implications for the marketing of food products in different cultures, which may be more successful appealing to concerns about environmental sustainability and animal welfare when targeting Euro-American vegetarians, but better advised to focus on the domains of purity and tradition when advertising to Indian vegetarians.

A potential limitation of the present research is that the Indian data in Study 1 are drawn only from participants recruited via Mturk. Although Mturk has been shown to be a reliable source of data (Buhrmeister et al., 2011), it is possible that these participants were more westernized than their peers. If this is indeed the case, then the differences between Indian vegetarians and omnivores may be even more pronounced among the general population. Indeed, we found this to be the case in Study 2 – although the overall pattern of results was the same, the average effect size of omnivore/vegetarian differences among Indian participants from the university in Karnataka State was more than double the average effect size among Indian participants recruited from Mturk. To the extent that this pattern generalizes to other phenomena, it may suggest that studies relying solely on Indian participants recruited

Table 5
Correlations with each cultural group between meat pollution beliefs, religiosity, and concern for the Five Moral Foundations.

	1	2	3	4	5	6	7
<i>Euro-American</i>							
1. Meat Pollution	-.03	.04	-.01	.043	-.104	.00	
2. Religiosity		.32***	.19**	.12*	.18**	.13*	
3. Purity			.63***	.58***	.35***	.38***	
4. Authority				.58***	.24*	.33***	
5. Ingroup					.27***	.43***	
6. Harm						.63***	
7. Fairness							
<i>Euro-Canadian</i>							
1. Meat Pollution	.13	.05	.12	.09	-.10	-.01	
2. Religiosity		.24*	.20*	.17	.22*	.02	
3. Purity			.61***	.65***	.41***	.43***	
4. Authority				.60***	.35***	.46***	
5. Ingroup					.36***	.51***	
6. Harm						.61***	
7. Fairness							
<i>Indian (Mturk)</i>							
1. Meat Pollution	.22***	.29***	.25***	.22***	.14*	.16*	
2. Religiosity		.15*	.12	.09	.09	.05	
3. Purity			.69***	.65***	.54***	.62***	
4. Authority				.68***	.47***	.64***	
5. Ingroup					.60***	.70***	
6. Harm						.74***	
7. Fairness							
<i>Indian (Karnataka)</i>							
1. Meat Pollution	.25***	.67***	.64***	.64***	.56***	.57***	
2. Religiosity		.22**	.31***	.21**	.17*	.18*	
3. Purity			.82***	.86***	.70***	.68***	
4. Authority				.85***	.56***	.72***	
5. Ingroup					.65***	.81***	
6. Harm						.67***	
7. Fairness							

Note.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

from Mturk can be relatively underpowered. Given the increasing popularity of using Mturk for recruiting Indian participants in psychological research, it is important to further investigate the ways in which Indian Mturk participants differ from the general population, and what implications this may have for cross-cultural research conducting solely via Mturk. Another potential limitation of the present research is that the study materials were administered to all participants in English, which carries the risk of participants responding in a more Western fashion (e.g., Bond & Yang, 1982; Trafimow, Silverman, Fan, & Law, 1997). This suggests that the cultural differences found here may be conservative estimates of the cultural differences between the two populations responding in their native tongue. Furthermore, it is important to acknowledge that all differences were obtained via self-report measures, and future work with behavioral measures would deepen the field's understanding of how vegetarians and omnivores differ from one another in different cultural contexts. Finally, although we had expected vegetarians and omnivores to differ similarly within American and Canadian cultural contexts, it appears that vegetarians and omnivores differ considerably less among Euro-Canadians. Given that very little research on the psychology of vegetarianism has been conducted in Canada, further research is required to discern the extent to which omnivore-vegetarian differences previously found within other Western societies do or do not hold in Canadian cultural contexts.

Taken together, the present studies demonstrate that moral reasoning can play a significant role in common, everyday decisions, such as what to have for dinner, and suggest that the psychological associations of vegetarianism are more nuanced than has been previously theorized. Although Western and Indian vegetarians arrived at the same moralized behavior, their motivations are based on very different moral principles, telling a cautionary tale for researchers who see a similarity in behavior across cultures and thereby assume a similarity in process.

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