

COMPASSION AND CONVENTION:
DIFFERENTIAL APPROACHES TO THE OMNIVORE'S DILEMMA

by

Matthew Byron Ruby

B.A., Colby College, 2005

M.A., University of British Columbia, 2008

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ABSTRACT

As omnivores, humans benefit from considerable nutritional flexibility. However, this blessing also comes with a curse, as humans also face a higher risk of consuming harmful substances or eating an improperly balanced diet, a phenomenon that Rozin (1976) calls “the omnivore's dilemma.” Previous research has shown that this dilemma is especially pronounced when dealing with meat, but has focused almost exclusively on Western participants, leaving several important questions unanswered. This dissertation extends the literature on the omnivore’s dilemma in three principal ways. Studies 1 and 2 demonstrate that providing people with visual reminders of the animal origins of meats reduces willingness to eat novel animals, but not willingness to eat commonly consumed animals, across Euro-Canadian, Asian-Canadian, Euro-American and Indian samples. Studies 3 and 4 examine what factors influence people’s decisions to eat animals, within Euro-Canadian, Hong Kong Chinese, Euro-American and Indian cultural contexts. Perceived animal intelligence and appearance were chief predictors of disgust, and reflecting on animals’ psychological attributes increased disgust, especially among Euro-Canadians and Euro-Americans. Concordant with past research, disgust was a major predictor of willingness to eat animals, but social influence (frequency of consumption by friends and family) also emerged as a strong predictor, especially among Hong Kong Chinese and Indians, providing evidence that friends and family have a stronger influence on one’s food choices in collectivistic cultural contexts. Studies 5 and 6 examine differences between vegetarians and omnivores in North American and Indian cultural contexts. In Study 5, we found that Euro-American vegetarians were more concerned with the impact of their food choices on the environment and animal welfare, more concerned with general animal welfare, endorsed

universalism more, and Right-Wing Authoritarianism less than omnivores, yet among Indian participants, these differences were not significant. In Study 6, we showed that Indian vegetarians more strongly endorsed the belief that eating meat is spiritually polluting, were more religious, and were more concerned with the domains of Purity and Authority, whereas these differences were largely absent among Euro-Canadians and Euro-Americans. Taken together, this research provides greater insight into how people resolve the omnivore's dilemma in different cultural contexts.

PREFACE

I am the primary author of the work presented in this PhD dissertation. I was responsible for the design of experiments, data collection, data analysis and manuscript preparation.

Additional contributions for each chapter are described below.

Chapter 1: Introduction.

I am the primary author of this chapter, with intellectual contributions from S. Heine. This chapter borrows directly from the literature reviews in each of the core research Chapters (2, 3, and 4), as well as from a previously published paper. Ruby, M. B. (2012). Vegetarianism: A blossoming field of study. *Appetite*, 58, 141-150.

Chapter 2: Visual reminders of animal origins reduce willingness to eat novel meats.

A version of this chapter has been submitted for publication. Ruby, M. B. (2012). Monkey on the menu: Visual reminders of animal origins reduce willingness to eat novel meats. I designed the experiments, supervised data collection, conducted the analyses and prepared the manuscript. S. Heine provided intellectual contributions and edited the manuscript.

Chapter 3: Factors predicting meat avoidance: The role of disgust and social influence.

A version of this chapter has been accepted for publication. Ruby, M. B. & Heine, S. J. (2012) Too close to home: Factors predicting meat avoidance. *Appetite*. DOI 10.1016/j.appet.2012.03.020. I designed the experiments, supervised data collection, conducted the analyses and prepared the manuscript. S. Heine provided intellectual contributions and edited the manuscript.

Chapter 4: How do vegetarians and omnivores differ across cultural contexts?

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Chapter 5: General Discussion.

I am the primary author of this chapter, with intellectual contributions from S. Heine.

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CHAPTER 1. INTRODUCTION

The acquisition, preparation, and consumption of food is central to everyday human life, often following only work and sleeping in percentage of daily time expenditure (Szalai, 1972). Similarly, much of the money earned from said work is devoted to the procurement of food – current estimates of percent of total household expenditures on food and drink range from approximately 7% in the USA and 10% in Canada, to 22% in China and 28% in India. Although the amount of money spent in the USA and Canada appears to be relatively small, these cultures are an exception— out of 84 countries surveyed in 2010, 54% have an average expenditure of greater than 20% (Meade, 2011). Despite the centrality and necessity of food in daily life, the psychology of food and eating (apart from research on obesity, eating disorders, and regulation of food intake), is greatly understudied (Rozin, 2007). As an illustrative example, Rozin (2006) found food-related index citations to be barely present in major introductory, developmental, and social psychological textbooks (median citations of 1, 1.5, and 0, respectively). That said, one domain that has received a modest amount of attention in the psychological discourse is how humans decide which foods to eat, and which to avoid.

In stark contrast to most other animals, who instinctively know what foods are good for them to eat, humans must learn these distinctions. Like chimpanzees, rats, and raccoons, humans are omnivores, benefiting from considerable nutritional flexibility. However, this blessing also comes with a curse— by experimenting with a wide range of foods, humans also face a higher risk of consuming toxins and harmful microbes, or of eating an improperly balanced diet, a phenomenon that Rozin (1976) calls “the omnivore's dilemma.” The omnivore’s dilemma is especially pronounced when dealing with meat, which is

paradoxically one of the most valued, yet most frequently tabooed foods (Angyal, 1941; Fessler & Navarrete, 2003; Rozin & Fallon, 1987).

Beardsworth (1995) breaks down the omnivore's dilemma into several components, including the life/death paradox— i.e., although eating is a necessary and unavoidable part of living, the process of eating often involves the death of another organism (see also Kass, 1999). There is broad cross-cultural evidence that humans experience discomfort around the killing of animals to obtain meat, and that they have several ways of diffusing this (Simoons, 1994). One common tactic is to create psychological distance, keeping animal slaughter out of sight and mind, and obscuring the link between meat and animal (Plous, 1993). A second tactic is to deny mental states to commonly eaten animals— indeed, direct reminders of the link between meat and animal suffering are not gladly received, leading people to further dementalize the animals that they eat (Bastian, Loughnan, Haslam, & Radke, 2012). A third, and more direct tactic, is to simply avoid eating meat altogether. In the following pages, I examine the past literature on each of these three strategies for resolving the life/death paradox of the omnivore's dilemma, and raise a number of empirical questions that follow from the extant literature.

Previous Research on Psychological Distancing and Meat Consumption

By its very nature, the eating of meat involves killing, taking apart, and consuming a living organism. Although the killing of plants tends to elicit relatively little moral concern, there is broad cross-cultural evidence that the killing of animals elicits some degree of guilt and tension, and that humans have several ways of diffusing this (e.g., Beardsworth, 1995; Plous, 1993; Simoons, 1994). In some pre-industrial societies, people believe that animals

consciously choose to let hunters find and kill them (Sharp, 1988), whereas in others, they conduct elaborate rituals to appease the spirit of the hunted animal (Coon, 1976), protecting themselves from the spirit's vengeance. In more industrial societies where farming has largely replaced hunting, a common tactic for reducing unpleasant feelings over the killing of animals is to physically and psychologically distance oneself from the origins of meat. Farm animals are kept out of sight, receiving disproportionately less media attention than other animals (Singer, 1975), and the act of killing is outsourced to butchers, with slaughterhouses and meat packing plants typically in remote locations (Simoons, 1994; Vialle, 1994; Wood, 1971).

It is not the case that people outsource slaughter simply out of convenience— rather, they are often motivated to do so. In a study of UK consumers, Richardson, Shepherd, and Elliman (1993) found that the majority of their respondents would stop eating meat altogether if they had to kill the animals whose meat they ate. In many cultures, the act of slaughter is considered so troubling that butchers are seen as impure and polluted as a result of their work, and are pushed to the fringes of society so as to avoid contaminating others (Simoons, 1994). After meat leaves the slaughterhouse, common marketing practices, wherein the flesh is pre-cut and sealed in hygienically sealed packages, further ensure the obfuscation of the link between meat and animal (Fiddes, 1997). Indeed, researchers have found that people often mentally separate the meat on their plate from its animal origins, so that they can peacefully eat porkchops and steaks without thinking about cows and pigs (Hoogland, de Boer, & Boersma, 2005). This process is even easier with ground meat— popular not only because of its uniform texture, the form of ground meat further obscures its animal origins (Holm & Møhl, 2000). Relatedly, people are especially unwilling to eat

animal products that are too reminiscent of the live animal, avoiding body parts associated with intelligence or personality, such as eyes and the brain, and animals are generally sold without their head and feet (Plous, 1993). The meat industry has taken initiatives to circumvent this aversion, increasing people's willingness to eat organ meats by using them as filler in ground meats and sausages (Wansink, 2002), which provides consumers with a familiar texture and appearance, while simultaneously removing animal origin reminders.

On a fundamental level, how people classify animals (e.g., as companion, pest, or food) has a dramatic impact on how they perceive and interact with them (Joy, 2009), and there is some evidence to suggest that reminders of animal origin might be more troubling for some species than others. Bilewicz, Imhoff, and Drogoz (2011) have shown that omnivores ascribe fewer humanlike emotions (e.g., tenderness, hope) to commonly eaten animals than to uncommonly eaten animals, whereas vegetarians, by definition removed from the practice of meat eating, do not make such a distinction. Similarly, Bastian et al. (2012) found that people attribute diminished mental capacities (e.g., self-control, memory) to commonly eaten animals, and that directly reminding people of the connection between meat-eating and animal suffering leads them to further dehumanize these animals. Additional experimental evidence demonstrates that simply categorizing an animal as a food source lowers people's perception of said animal's capacity for suffering, and subsequently reduces the amount of moral concern they feel for it (Bratanova, Loughnan, & Bastian, 2011).

Much classic theory on psychological distancing and meat consumption (e.g., Fiddes, 1997; Plous, 1993; Simoons, 1994) suggests that directly reminding people of the animal origins of different meats would lead to psychological discomfort, and make people subsequently less likely to eat them. On the other hand, more recent work suggests that

people conceive of commonly and uncommonly eaten animals in fundamentally different ways— they are motivated to dementalize commonly eaten animals (Bastian et al., 2012; Bratanova et al., 2011; Joy, 2009). Due to this, and years of habit of dining on commonly eaten animals, it is possible that their attitudes toward eating these animals would be more resistant to change. The vast majority of research on meat consumption has focused on people's attitudes toward commonly eaten animals, but ignored those animals less commonly used as food. Given that people would be unaccustomed to thinking of uncommonly eaten animals as food sources, and also less motivated to consider them less worthy of moral concern, it therefore stands to reason that people's attitudes toward eating their meats should be more impacted by reminders of their animal origins.

Factors Influencing People's Decisions to Eat Animals

The omnivore's dilemma is especially pronounced when dealing with meat, which is paradoxically one of the most valued, yet most frequently tabooed foods (Fessler & Navarrete, 2003). Animals often harbor a wide range of bacteria and protozoans (Schantz & McAuley, 1991), and after an animal dies, and its immune system ceases to function, these pathogens are able to proliferate more rapidly. Of course, animals are not the only potentially hazardous food sources – many species of plants and fungi are also highly toxic if ingested. Although detection of poisonous fungi can be difficult, most poisonous plants present clear signals of their toxicity (Hladik & Simmen, 1996), so as to discourage other organisms from eating them. Although bacteria often produce an unpleasant odor when proliferating on meat, natural selection has favored those microorganisms that can be consumed unknowingly, and detection of protozoa is especially difficult (Fessler & Navarrete, 2003). Thus, despite the fact that meat is a concentrated source of fat and protein,

pathogens in meat are often harder to detect than those in plants, and humans are especially well-served to have feelings of uncertainty and ambivalence about eating unfamiliar animals.

How, then, do people decide which animals to eat, and which to avoid? People rarely consider scavengers, carnivores, and those animals associated with dirt and filth, such as mice and insects, as viable food options (Angyal, 1941). Animals closely associated with house and home, such as dogs and cats in most Western societies, are also frequently tabooed (Fessler & Navarrete, 2003). Theorists have proposed that the avoidance of meat may be related to an animal's perceived similarity to humans (Angyal, 1941; Rozin & Fallon, 1987), in part because humans are more vulnerable to parasites and pathogens from more closely related species (Fessler & Navarrete, 2003). Turning from the biological to the psychological, there is broad, cross-cultural evidence that the killing of animals for food elicits varying degrees of guilt and tension (e.g., Beardsworth, 1995; Plous, 1993; Simoons, 1994), and that people often mentally separate the meat they eat from its ultimate animal origins, such that they can eat steak and sausages without thinking of the cows and pigs from which they came (Hoogland et al., 2005). Therefore, humans may be especially reticent to kill and eat animals that they perceive to have similar mental and emotional capacities as themselves. Indeed, people ascribe higher cognitive functions to animals that they perceive to be similar to themselves (Epley, Waytz, Akalis, & Caccioppo, 2008), and relative to vegetarians, omnivores attribute significantly less mental and emotional complexity to animals (Bilewicz et al., 2011). How people classify animals (e.g., as pest, pet, or food) has a dramatic impact on how they interact with them (Joy, 2009). Experimental evidence reveals that simply categorizing animals as food sources significantly reduces participants' ratings of said animals' capacity for suffering, and subsequent moral concern (Bratanova et

al., 2011). Likewise, people were found to attribute diminished mental capacities (e.g., fear, self-control, memory) to commonly eaten animals, and direct reminders of the link between meat eating and animal suffering were not gladly received, leading people to further dementalize the animals that they eat (Bastian et al., 2012). Furthermore, participants who were randomly assigned to eat beef jerky later expressed less concern for cows, considered them less worthy of moral status, and rated them as less capable of suffering than those who had been randomly assigned to consume nuts (Loughnan, Haslam, & Bastian, 2010).

Often, when people are asked why they wouldn't eat a particular animal, rather than directly invoking concerns about animal mental states, they respond with a simple "that's disgusting!" Acting as the stomach's gatekeeper, the emotion of disgust is proposed to have evolved to prevent humans from ingesting harmful substances, and is especially sensitive to indicators of blood, excrement, sex, death, and disease (Haidt, Rozin, McCauley, & Imada, 1997). Disgust is a critical factor in determining people's willingness to ingest a given food (Rozin & Fallon, 1987), but what particular animal characteristics predict disgust at eating animals? Bastian et al. (2012) demonstrated that perceived mental capacity (a composite of attributes ranging from capacity for pain and fear to emotion recognition) was negatively associated with animal edibility. Beyond characteristics of the animals themselves, Ruby (2008) found that whereas disgust was the strongest negative predictor of people's willingness to eat a range of animals, exposure to animals' meat in stores positively predicted their willingness to eat them, ostensibly because the presence of the meats in stores indicates that other people in one's community are eating them on a regular basis, and that the consumption of such meats is both safe and socially acceptable.

Although culture itself plays a dramatic role in shaping people's food preferences (Rozin, 1990), little is presently known about the factors that underlie people's willingness to eat, and feelings of disgust at the thought of eating animals in non-Western, collectivistic cultures. Indeed, psychology in general has conducted distressingly little research in non-Western cultural contexts (Henrich, Heine, & Norenzayan, 2010). Regarding food in general, there is evidence within a number of individualistic Western cultures for a significant, yet small influence of one's family members on one's food choices (e.g., Hursti & Sjöden, 1997; Pliner & Pelchat, 1986; Rozin, 1991; Rozin, Fallon, & Mandell, 1984; Rozin & Millman, 1987). Referring to close others' food choices when deciding what foods to eat should be useful in all cultural contexts, as it stands to reason that commonly eaten foods are likely to taste good, and be reasonably safe to consume. However, there is evidence to suggest that the food choices of close others might hold greater predictive power in other cultural contexts. Within collectivistic cultures, more value is placed on fitting in with close others, and people in these cultures exhibit higher levels of conformity than those from individualistic cultures (e.g., Bond & Smith, 1996; Cialdini & Goldstein, 2004). Past research has shown that relative to Euro-Americans, East Asians based their choices on what others liked (Iyengar & Lepper, 1999; Kim & Markus, 1999), and this trend was mirrored within advertising in popular magazines, such that advertisements in Korean magazines more frequently emphasized themes of conformity and group harmony, whereas American advertisements more commonly utilized themes of uniqueness and individuality (Kim & Markus, 1999). Similarly, recent research on how people from different cultures choose consumer products has indicated that those in Indian cultural contexts are less likely than those from North American cultural contexts to choose according to their personal

preferences (Savani, Markus, & Conner, 2008). Thus, the food choices of close others may influence people's own choices to a greater degree in collectivistic cultural contexts.

Previous Research on the Psychology of Vegetarianism

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). 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).

Motivations for Vegetarianism

Among the majority of recent studies, the most common motivation reported by Western 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.

Table 1. Motivations for vegetarianism. © [Appetite](#), 2012, by permission.

Study	Location	N	% Women	Percent Giving Reason					
				Moral	Health	Environment	Disgust	Religion	Other
Beardsworth & Keil (1991b)	UK	76	51.3	65.8	26.3	1.3	19.7		
Fox & Ward (2008)	USA, Canada, UK	33	70	45	27	3			25
Hamilton (2006)	UK	47	61.7	48.9	34		10.6		19.2
Hussar & Harris (2009)	USA	16	68.8	71.9	6.2		9.4	9.4	15.6
Jabs, Devine, & Sobal (1998b)	USA	19	68.4	57.9	42.1				
Krizmanic (1992)	USA	301	68	19	46	4			30
Neale, Tilston, Gregson, & Stagg (1993)	UK	174	100	91	39			6	37
Potts & White (2008)	New Zealand	155	77.4	53.7		7.1		14.5	
Preylo & Arikawa (2008)	USA	72	79.2	68.1					31.9
Rozin, Markwith, & Stoess (1997)	USA	104	66.35	64.1	76.7	60.7	53	22.6	55.4
Santos & Booth (1996)	UK	13	100	92	0		61		23
White, Seymour, & Frank (1999)	USA	360	100	41.6	69	32.1	40.6	30	10.7

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%), 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 and 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.

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).

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.

Attitudes Toward Meat

Given differences in eating practices, it is perhaps unsurprising that Western 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, and 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).

Even among omnivores, attitudes toward meat eating have been changing in many Western societies. In a survey of UK consumers, Richardson et al. (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* (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, 2011). 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.

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. 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, it was our aim to conduct research on attitudes toward meat consumption in current populations, and a broader array of cultural contexts.

Vegetarianism and Gender

One factor that often arises in the literature on meat and vegetarianism is gender, as men and women 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 (O'Laughlin, 1974; Leghorn & Roodkowsky, 1977) and Southeast Asia (Simoons, 1994) to Europe (Fiddes, 1991; O'Doherty, Jensen & Holm, 1999) and North America (Sobal, 2005). Recent research by Rozin, Hormes, Faith, and Wansink (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 serving of fruits and vegetables (Baker & Wardle, 2003; Fraser, Welch, Luben, Bingham, & Day, 2000), and are likely to view healthy eating with suspicion, preferring large, "masculine" portions, usually revolving around meat (Gough & Conner, 2006; Mróz, Chapman, Oliffe, & Bottorff, 2011). 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, Hormes, Faith, & Wansink, in press).

It is, then, unsurprising that vegetarian women greatly outnumber vegetarian men in Western societies (Amato & Partridge, 1989; Beardsworth & Bryman, 1999; Fraser, Welch, Luben, Bingham, & Day, 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, Klapac, & 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).

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. Indeed, many researchers have had considerable difficulty recruiting more than a modest number of male vegetarians (for a review, see Ruby, 2012). Not only are

women far more likely to be vegetarian than men, but among those who do eat meat, they eat less meat than men, report less liking for it, and consider meatless meals to be more pleasant than do men. Given that women tend to be more preoccupied than men with their weight (e.g., Tiggemann, 1994), it is possible that weight concerns may underlie some of the gender differences in consumption. These links are not yet fully understood (Gilbody, Kirk, & Hill, 1999), but a recent study revealed that whereas full vegetarians did not demonstrate higher levels of dietary restraint than omnivores, semi-vegetarians (who only restricted red meat from their diet) and flexitarians (occasional consumers of red meat) scored higher in dietary restraint than omnivores (Forestell, Spaeth, & Kane, 2012). Although the associations between meat and gender span a broad range of cultures (Adams, 1991; Twigg, 1979), it is an open question how the strength of these associations varies between cultural contexts.

Values and Worldviews

Several studies provide convergent evidence that Western vegetarians and omnivores endorse different sets of values, with broadly liberal values more associated with vegetarians and broadly 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, people endorsing Universalistic values (e.g., peace, equality, and social justice) were more likely to be vegetarian, whereas those endorsing traditional values (e.g., family security, obedience, and social order) were more likely to be omnivores (Dietz, Frisch, Kalof, Stern, & Guagnano, 1995; Kalof, Dietz, Stern, & Guagnano, 1999). 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, and Dunne; 2000). 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 US 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). Research in the Netherlands 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).

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 and concerns of vegetarians and omnivores, and whether these differ across cultural contexts. A common critique of the past research on vegetarianism and meat consumption is that it is often more descriptive than theoretical. Given that, and that the anchors of “liberal” and “conservative” can take on considerably different meanings from person to person, and culture to culture, we chose to direct the next stages of our inquiry to Moral Foundations Theory (Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007), which partitions people’s moral intuitions into five major domains. The ethics of Harm and Fairness, expansions of the ethic of Autonomy proposed by Shweder, Much, Matapatra, 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 of morality, such as Gilligan's (1982) Moral Development Theory and Turiel's (1983) Social Domain Theory. Indeed, most past research on psychological differences between Western vegetarians and omnivores has focused on such domains as concern for animal welfare, pacifism, social equality, and empathy (Ruby, 2012), which fall within the boundaries of the ethics of Harm and Fairness.

In stark contrast to these older theories of moral psychology, Moral Foundations Theory also considers the ethics of Ingroup, Authority, and Purity to be major domains of moral concern. The ethics of Ingroup and Authority, expansions 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, respectively, whereas the ethic of Purity, corresponding to the ethic of Divinity (Shweder et al., 1997), is concerned with the extent to which one's controls one's desires, follows the 'natural order', and adheres to religious laws. Recent research has indicated that North American liberals value the ethics of Harm and Fairness more than the ethics of Ingroup, Authority, and Purity, whereas North American conservatives value all five ethics to relatively the same extent (Graham et al., 2009; Haidt & Graham, 2007). To what extent, then, might vegetarians and omnivores differ in their concern for the Moral Foundations, and how might this differ across cultures?

Vegetarianism and Culture

Historically, vegetarianism in the West has been a countercultural dietary practice, traditionally associated with ethical 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 demonstrate especially heightened concern with the ethics of Harm and Fairness. A small body research on Western vegetarians suggests that they hold less favorable attitudes toward “traditional values” than their omnivorous peers (e.g., Allen et al., 2000; Dietz et al., 1995; Kalof et al., 1999). As such, one would predict that Western vegetarians would also be less concerned with the ethic of Authority than Western omnivores. Although no past research has been conducted testing whether vegetarians prioritize members of the ingroup more than do omnivores, there is considerable evidence that members of minority groups exhibit more ingroup bias than members of majority groups (e.g., Bettencourt, Miller, & Hume, 1999; Brewer, Manzi, & Shaw, 1993; Brown & Smith, 1999; Simon & Brown, 1987). Given that vegetarians are a distinct minority in North American cultural contexts (~8% in Canada and ~3% in the USA; Cunningham, 2009; Ipsos-Reid, 2004), and sometimes encounter hostility about their dietary choices (Kellman, 2000; Monin & Minson, 2007), it stands to reason that they may diverge from the typical liberal pattern of concerns, and be more concerned with the ethic of Ingroup than their omnivorous peers. Furthermore, given that vegetarianism is rarely motivated by religion in Western cultural contexts (Ruby, 2012), Western vegetarians and omnivores should not significantly differ in their concern for the ethic of Purity.

Turning to other cultural contexts, the history of vegetarianism is markedly different. In India, the practice of vegetarianism has been firmly established for centuries, and is

associated with tradition, power and status. Furthermore, rather than choosing to transition at some point from an omnivorous diet, most Indian vegetarians are raised as such by their families, and this practice often continues to be an important part of their identity even upon moving to different cultures (e.g., Chapman, Ristovski-Slijepcevic, & Beagan, 2011; Saunders, 2007). Given this, it follows that Indian vegetarians would likely be more concerned with the ethic of Authority than their omnivorous counterparts. Furthermore, vegetarianism in India has traditionally been motivated by religious beliefs, and has been chiefly concerned with the domains of asceticism and purity, such that the aim of vegetarianism is not so much to promote animal welfare (save the religious taboo on killing cows), 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. Furthermore, although vegetarianism is more mainstream in India than in most other cultures, Indian vegetarians remain a minority group, and as such, 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, 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 later report a broader

range of reasons for vegetarianism, and exhibit greater disgust at meat consumption than those initially motivated by concern for personal health, and that people tend to accumulate more reasons for their vegetarianism over time. 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 animal welfare, environmental sustainability, and the ethics of Harm and Fairness. However, despite the longstanding prevalence of vegetarianism in India, the literature is largely mute regarding its psychological associations, making a psychological investigation of omnivore-vegetarian differences in Indian cultural contexts long overdue.

Overview of the Dissertation

Previous research on the omnivore's dilemma has focused almost exclusively on participants from Western cultural contexts, leaving a number of important questions unanswered. This dissertation presents six studies – organized into three manuscript-style research chapters – that examine three different strategies for resolving the omnivore's dilemma, across five different cultural contexts.

First, Studies 1 and 2 examine whether reducing psychological distance between novel meats and their animal origins, by showing people pictures of the animals in question, subsequently reduces willingness to eat them. Study 1 draws on Euro-Canadian and Asian-Canadian samples, and Study 2 draws on Euro-American and Indian samples. Across both

studies, visual reminders of animal origins reduced people's willingness to eat novel meats, but did not significantly impact willingness to eat meats from commonly eaten animals.

Second, Studies 3 and 4 examine what factors influence people's decisions to eat some animals, and to avoid others. Study 3 draws on Euro-Canadian and Hong Kong Chinese samples, and Study 4 draws on Euro-American and Indian samples. Across all samples, perceived animal intelligence and appearance emerged as the chief predictors of disgust at the thought of eating them. Furthermore, reflecting on animals' psychological attributes increased reported disgust, especially among Euro-Canadians and Euro-Americans, suggesting that these factors are more influential in shaping disgust in individualistic cultural contexts. Concordant with past research, disgust was a major predictor of willingness to eat animals, but social influence (frequency of consumption by friends and family) also emerged as a strong predictor, especially among Hong Kong Chinese and Indians, providing evidence that one's friends and family have a stronger influence on one's food choices in collectivistic cultural contexts.

Finally, Studies 5 and 6 examine differences between vegetarians and omnivores in North American (Euro-American and Euro-Canadian) and Indian cultural contexts. In Study 5, we found that Euro-American vegetarians were more concerned with the impact of their daily food choices on the environment and animal welfare, showed more concern for general animal welfare, endorsed universalism more, and Right-Wing Authoritarianism less than omnivores, yet among Indian participants, these differences were not significant. In Study 6, we showed that Indian vegetarians more strongly endorsed the belief that eating meat is spiritually polluting, were more religious, and showed a heightened concern for the

conservative ethics of Purity and Authority, whereas these dietary differences were largely absent among Euro-Canadians and Euro-Americans.

The final chapter of this dissertation summarizes the research contained in Chapters 2-4 and discusses implications, limitations and several avenues for future research.

CHAPTER 2. VISUAL REMINDERS OF ANIMAL ORIGINS REDUCE WILLINGNESS TO EAT NOVEL MEATS¹

By its very nature, the eating of meat involves killing, taking apart, and consuming a living organism. Although the killing of plants tends to elicit relatively little moral concern, there is broad cross-cultural evidence that the killing of animals elicits some degree of guilt and tension, and that humans have several ways of diffusing this (e.g., Beardsworth, 1995; Plous, 1993; Simoons, 1994). In some pre-industrial societies, hunters believe that a given animal consciously chooses to let the hunters find and kill it (Sharp, 1988), whereas in others, they conduct elaborate rituals to appease the spirit of the hunted animal (Coon, 1976), protecting themselves from wrathful vengeance. In industrial societies where farming has largely replaced hunting, a common tactic for reducing unpleasant feelings over the killing of animals is to psychologically distance oneself from the origins of meat. Farm animals are kept out of sight, receiving disproportionately less media attention than other animals (Singer, 1975), and the act of killing is outsourced to butchers, with slaughterhouses and meat packing plants typically in remote locations (Simoons, 1994; Wood, 1971).

It is not the case that people outsource slaughter simply out of convenience— in a study of UK consumers, Richardson et al. (1993) found that the majority of their respondents would stop eating meat altogether if they had to kill the animals whose meat they ate. In many cultures, the act of slaughter is considered so troubling, that butchers are seen as

¹ A version of this chapter has been submitted for review. Ruby, M. B. (2012). Monkey on the menu: Visual reminders of animal origins reduce willingness to eat novel meats. *European Journal of Social Psychology*.

impure and polluted as a result of their work, and are pushed to the fringes of society so as to avoid contaminating others (Simoons, 1994). After meat leaves the slaughterhouse, common marketing practices, wherein the flesh is pre-cut and sealed in hygienically sealed packages, further ensure the obfuscation of the link between meat and animal (Fiddes, 1997). Indeed, researchers have found that people often mentally separate the meat on their plate from its animal origins, so that they can peacefully eat porkchops and steaks without thinking about cows and pigs (Hoogland et al., 2005). This process is even easier with ground meat—popular not only because of its uniform texture, the form of ground meat further obscures its animal origins (Holm & Møhl, 2000). Relatedly, people are especially unwilling to eat animal products that are too reminiscent of the live animal, avoiding body parts associated with intelligence or personality, such as eyes and the brain, and animals are generally sold without their head and feet (Plous, 1993). The meat industry has taken initiatives to circumvent this aversion, increasing people’s willingness to eat organ meats by using them as filler in ground meats and sausages (Wansink, 2002), which provides consumers with familiar a familiar texture and appearance, while simultaneously removing animal origin reminders.

On a fundamental level, how people classify animals (e.g., as companion, pest, or food) has a dramatic impact on how they perceive and interact with them (Joy, 2009), and there is some evidence to suggest that reminders of animal origin might be more troubling for some species than others. Bilewicz et al. (2011) have shown that omnivores ascribe fewer humanlike emotions (e.g., tenderness, hope) to commonly eaten animals than to uncommonly eaten animals, whereas vegetarians, by definition removed from the practice of meat eating, do not make such a distinction. Similarly, Bastian et al. (2012) found that

people attribute diminished mental capacities (e.g., self-control, memory) to commonly eaten animals, and that directly reminding people of the connection between meat eating and animal suffering leads them to further dehumanize these animals. Additional experimental evidence demonstrates that simply categorizing an animal as a food source lowers people's perception of said animal's capacity for suffering, and subsequently reduces the amount of moral concern they feel for it (Bratanova et al., 2011).

Much classic research on psychological distancing and meat consumption (e.g., Fiddes, 1997; Plous, 1993; Simoons, 1994) suggests that directly reminding people of the animal origins of different meats would lead to psychological discomfort, and make people subsequently less likely to eat them. On the other hand, more recent work suggests that people conceive of commonly and uncommonly eaten animals in fundamentally different ways— they are motivated to dehumanize commonly eaten animals (Bastian et al., 2012; Bratanova et al., 2011; Joy, 2009), and as such, it is possible that their attitudes toward eating these animals might be more resistant to change. The vast majority of research on meat consumption has focused on people's attitudes toward commonly eaten animals, but ignored those animals less commonly used as food. Given that people would be unaccustomed to thinking of uncommonly eaten animals as food sources, and therefore less motivated to consider them less worthy of moral concern, it stands to reason that people's attitudes toward said animals should be more malleable. Thus, I hypothesized that a very simple reminder of meats' animal origins – viewing pictures of the animals from which they came – would reduce people's willingness to consume novel meats, but not significantly impact their willingness to consume familiar meats. Given meat's long history as a “man's food” (Adams, 1991; Twigg, 1979; Rozin et al., in press; Ruby & Heine, 2011; Sobal, 2005),

and given that women report less liking for the taste of meat and express greater concern for animal welfare than do men (for a review, see Ruby, 2012), I also hypothesized that women would be less willing to eat meat than men. In light of the small body of research that women in some preindustrial cultures are more likely than men to reject unfamiliar meats (Simoons, 1994), I expected particularly large gender differences in willingness to eat novel meats.

Although culture plays a dramatic role in shaping people's food preferences (e.g., Rozin, 1990), psychologists know very little about meat consumption in non-Western cultures. Indeed, psychology in general has conducted distressingly little research in non-Western cultural contexts (Henrich et al., 2010), especially regarding meat consumption (Ruby, 2012). Thus, in the present research, I investigated the impact of visual reminders of meats' animal origins across several cultural groups, drawing on Euro-Canadian and Asian-Canadian students (Study 1), as well as Euro-American and Indian community samples (Study 2).

Study 1

Method

Sixty-six people were recruited from the University of British Columbia campus to participate on a voluntary basis (38 Asian-Canadians, 55% women, $M_{\text{age}} = 21.6$, $SD_{\text{age}} = 2.97$; 28 Euro-Canadians, 50% women, $M_{\text{age}} = 24.3$, $SD_{\text{age}} = 10.37$). Due to the nature of the

research questions, an additional 5 non-omnivore participants (2 Asian-Canadian, 3 Euro-Canadian) were excluded from analysis.²

Participants completed a survey in which they were asked to imagine they were eating at a buffet restaurant that specialized in a wide array of meats. The restaurant served dishes made from 14 animals– 10 that pilot testing indicated to be novel and uncommonly eaten (cricket, crow, dog, dolphin, fox, horse, kangaroo, monkey, parrot, rat) and 4 that pilot testing indicated to be commonly eaten (chicken, cow, lamb, pig). Each item on the menu consisted of a title and a brief description (e.g., Barbeque Monkey Ribs: Exotic monkey ribs are basted in sweet and tangy tamarind-guava barbeque sauce; Belgian Steak-Frites: A Belgian delicacy, this filet mignon of horse is char-broiled and served with a cognac peppercorn sauce and Belgian fries).

Participants were randomly assigned to one of three versions of the survey, all of which used the exact same menu items and descriptions. In the *Control* condition, the menu consisted of text only. In the *Food* condition, each item on the menu was accompanied by a picture of the dish in question. In the *Animal* condition, each item on the menu was accompanied by a picture of the live animal whose meat was in the dish. Participants indicated their willingness to eat each dish on a nine-point scale (-4 = *extremely unwilling*, 0 = *neutral*, 4 = *extremely willing*).

² These data were originally collected in 2010. As such, the original theoretical impetus for Studies 1 and 2 was from Joy (2009), as I was not aware of the concurrent and related research of Bastian et al. (2012) and Bratanova et al. (2011).

Results & Discussion

To analyze the data, I conducted a $3 \text{ (condition)} \times 2 \text{ (gender)} \times 2 \text{ (culture)}$ ANOVA for both the set of novel meats, and the set of familiar meats. For the novel meats, there was a significant effect of condition, $F(2,52) = 3.93, p < .03$. Fisher PLSD post-hoc comparisons indicated that participants in the *Animal* condition ($M = -1.70, SD = 2.15$) were less willing to eat the novel meats than participants in both the *Food* condition ($M = -0.43, SD = 2.18, p < .04, d = .59$) and the *Control* condition ($M = -0.14, SD = 1.81, p < .02, d = .78$), but participants in the *Food* and *Control* condition did not significantly differ from one another. There was also a significant effect of gender, such that women were less willing to eat the novel meats ($M = -1.32, SD = 2.40$) than men ($M = -0.19, SD = 1.76$), $F(1,52) = 5.32, p < .03, d = .54$. Furthermore, there was a significant effect of culture, such that Euro-Canadian participants ($M = -1.25, SD = 1.72$) were less willing to eat the novel meats than Asian-Canadian participants ($M = -0.26, SD = 2.41$), $F(1,52) = 4.08, p < .05, d = .47$. Finally, there was a significant interaction between gender and condition, $F(1,52) = 13.40, p < .04$. Analysis of simple effects revealed that, whereas there were no significant differences in the *Control* or *Animal* conditions, women were significantly less willing than men to eat the novel meats in the *Food* condition ($p < .03$). No other main effects or interactions were significant. For means and standard deviations, see Table 2.

Turning to the commonly eaten animals, there was significant effect of gender, such that women were less willing to eat the familiar meats ($M = 2.78, SD = 1.58$) than men ($M = 3.50, SD = 0.97$), $F(1,52) = 5.62, p < .03, d = .55$. Neither the effect of culture nor the effect of condition was significant. Gender interacted significantly with both condition ($p < .04$) and culture ($p < .01$). Analysis of simple effects revealed that women were significantly less

willing than men to eat the familiar meats in the *Food* condition ($p < .03$), but there were no significant gender differences in the other conditions. Furthermore, although there was no significant gender difference among Asian-Canadians, Euro-Canadian women were less willing to eat the familiar meats than Euro-Canadian men, $p < .01$. No other interactions were significant.

Table 2. Means and standard deviations of willingness to eat meats in Study 1.

Condition	Novel Meats	Familiar Meats
Control	-0.14 (1.81) _a	3.30 (1.18) _c
Food	-0.43 (2.18) _a	3.06 (1.71) _c
Animal	-1.70 (2.15) _b	3.05 (1.21) _c

Note: Means that do not share subscripts differ at $p < .05$.

As hypothesized, visual reminders of animal origins significantly reduced participant willingness to eat novel meats. Also as expected, women were less willing to eat the novel meats than men. Overall cultural differences emerged, such that Euro-Canadian participants were less willing to eat the novel meats than Asian-Canadian participants. As predicted, visual reminders of animal origins did not impact participant willingness to eat familiar meats, and gender differences were less pronounced, only reaching significance within Euro-Canadian participants. Although Study 1 provides initial evidence for the differential impact of visual reminders of animal origins on willingness to eat familiar and novel meats, it could be wider in its cultural scope. Thus, in Study 2, I broaden the generalizability of the research, conducting a replication with Euro-American and Indian community samples.

Study 2

Method

Ninety-nine people (55 Indians, 29% women, $M_{\text{age}} = 27.5$, $SD_{\text{age}} = 6.23$; 44 Euro-Americans, 61% women, $M_{\text{age}} = 32.3$, $SD_{\text{age}} = 11.44$) were recruited for a small honorarium from Amazon.com's Mechanical Turk testing service (an online, inexpensive, and reliable source of data; Buhrmeister, Kwang, & Gosling, 2011). Due to the nature of the research questions, an additional 59 non-omnivore participants (53 Indian, 6 Euro-American) were excluded from analysis. Online materials were identical to those in Study 1.

Results & Discussion

To analyze the data, I conducted a 3 (condition) \times 2 (gender) \times 2 (culture) ANOVA for both the set of novel meats and the set of familiar meats. There was a significant effect of condition, $F(2,87) = 6.58$, $p < .01$. Fisher PLSD post-hoc comparisons indicated that participants in the *Animal* condition ($M = -2.32$, $SD = 1.51$) were less willing to eat the novel meats than participants in both the *Food* condition ($M = -0.67$, $SD = 1.95$, $p < .001$, $d = .95$) and the *Control* condition ($M = -0.93$, $SD = 1.91$, $p < .01$, $d = .81$), but participants in the *Food* and *Control* condition did not significantly differ from one another. There was also a significant effect of gender, such that women were less willing to eat the novel meats ($M = -1.86$, $SD = 1.81$) than men ($M = -0.75$, $SD = 1.91$), $F(1,87) = 8.30$, $p < .01$, $d = .60$. Neither the effect of culture nor any interactions were significant. For means and standard deviations, see Table 3.

Table 3. Means and standard deviations of willingness to eat meats in Study 2.

Condition	Novel Meats	Familiar Meats
Control	-0.93 (1.91) _a	2.35 (1.62) _c
Food	-0.67 (1.95) _a	2.47 (1.63) _c
Animal	-2.32 (1.51) _b	1.92 (1.73) _c

Note: Means that do not share subscripts differ at $p < .05$.

Turning to the commonly eaten animals, I excluded cow from analysis, given the particular status it has in Indian culture³. The main effect of gender was significant, such that women were less willing to eat the familiar meats ($M = 1.82$, $SD = 1.92$) than men ($M = 2.68$, $SD = 1.35$), $F(1,87) = 5.79$, $p < .02$, $d = .52$. No other main effects or interactions were significant.

Replicating the main results of Study 1, visual reminders of animal origins significantly reduced participant willingness to eat novel meats, but did not significantly impact willingness to eat common meats. Again, women were less willing than men to eat both novel and familiar meats, although the gender difference in familiar meats did not differ significantly by culture.

³ Including cow in the group of familiar meats does not alter our inferences, save that the main effect of gender becomes not significant and the main effect of culture becomes significant, such that Indian participants report less willingness to eat the familiar meats than Euro-American participants, $p < .03$.

General Discussion

Taken together, the two studies support the hypothesis that visual reminders of animal origins reduce people's willingness to eat novel meats. This pattern was robust, emerging within both Euro-Canadian and Asian-Canadian student samples, and Euro-American and Indian community samples. Although culture emerged as a significant factor in Study 1, such that Euro-Canadians were less willing than Asian Canadians to eat the novel meats, culture did not interact with condition in either study, demonstrating the efficacy of visual reminders of animal origin across a broad array of cultural contexts. Concordant with past literature on meat and masculinity (e.g., Adams, 1991; Rozin et al., in press; Simoons, 1994), there were strong and consistent gender effects, such that women in all of the samples were less willing to eat novel meats than were men.

As predicted, visual reminders of animal origin did not significantly impact willingness to eat meats from commonly eaten animals whom many omnivores consider relatively unworthy of moral concern (Bastian et al., 2012; Bilewicz et al., 2011; Joy, 2009). It is possible that stronger reminders of the link between meat and animal, such as familiarizing people with the process by which these animals become the contents of the cling-wrapped packages for sale in the supermarket, would impact people's willingness to eat even familiar animals. Indeed, initial evidence for this comes from Hormes et al. (2011), who found that reading Michael Pollan's (2006) *The Omnivore's Dilemma*, which details many of the practices of the meat industry, subsequently reduced students' willingness to eat meat. Further investigation of the role of psychological distancing across a variety of cultural contexts would further illuminate the ways in which people engage with, or disengage from, what's on their plate.

CHAPTER 3. WHAT FACTORS PREDICT WILLINGNESS TO EAT ANIMALS?⁴

In stark contrast to most other animals, who instinctively know what foods to eat, humans must learn these distinctions. Like bears, chimpanzees, and raccoons, most humans follow an omnivorous diet, and benefit from remarkable nutritional flexibility. However, this flexibility is not without its downsides – by choosing from a wider range of foods, humans also have a higher risk of consuming harmful substances or missing essential nutrients, a phenomenon that Rozin (1976) refers to as “the omnivore’s dilemma.” The omnivore’s dilemma is especially pronounced when dealing with meat, which is paradoxically one of the most valued, yet most frequently tabooed foods (Fessler & Navarrete, 2003). Animals often harbor a wide range of bacteria and protozoans (Schantz & McAuley, 1991), and after an animal dies, and its immune system ceases to function, these pathogens are able to proliferate more rapidly. Of course, animals are not the only potentially hazardous food sources – many species of plants and fungi are also highly toxic if ingested. Although detection of poisonous fungi can be difficult, most poisonous plants present clear signals of their toxicity (Hladik & Simmen, 1996), so as to discourage other organisms from eating them. Although bacteria often produce an unpleasant odor when proliferating on meat, natural selection has favored those microorganisms that can be consumed unknowingly, and detection of protozoa is especially difficult (Fessler & Navarrete, 2003). Thus, despite the fact that meat is a concentrated source of fat and protein,

⁴A version of this chapter has been accepted for publication. Ruby, M. B., & Heine, S. J. (2012). Too close to home: Factors predicting meat avoidance. *Appetite*. DOI 10.1016/j.appet.2012.03.020.

pathogens in meat are often harder to detect than those in plants, and humans are especially well-served to have feelings of uncertainty and ambivalence about eating unfamiliar animals.

How, then, do people decide which animals to eat, and which to avoid? People rarely consider scavengers, carnivores, and those animals associated with dirt and filth, such as mice and insects, as viable food options (Angyal, 1941). Animals closely associated with house and home, such as dogs and cats in most Western societies, are also frequently tabooed (Fessler & Navarrete, 2003). Theorists have proposed that the avoidance of meat may be related to an animal's perceived similarity to humans (Angyal, 1941; Rozin & Fallon, 1987), in part because humans are more vulnerable to parasites and pathogens from more closely related species (Fessler & Navarrete, 2003). Turning from the biological to the psychological, there is broad, cross-cultural evidence that the killing of animals for food elicits varying degrees of guilt and tension (e.g., Beardsworth, 1995; Plous, 1993; Simoons, 1994), and that people often mentally separate the meat they eat from its ultimate animal origins, such that they can eat steak and sausages without thinking of the cows and pigs from which they came (Hoogland et al., 2005). Therefore, humans may be especially reticent to kill and eat animals that they perceive to have similar mental and emotional capacities as themselves. Indeed, people ascribe higher cognitive functions to animals that they perceive to be similar to themselves (Epley, Waytz, Akalis, & Cacioppo, 2008), and relative to vegetarians, omnivores attribute significantly less mental and emotional complexity to animals (Bilewicz et al., 2011). How people classify animals (e.g., as pest, pet, or food) has a dramatic impact on how they interact with them (Joy, 2009). Experimental evidence reveals that simply categorizing animals as food sources significantly reduces participants' ratings of said animals' capacity for suffering, and subsequent moral concern (Bratanova et

al., 2011). Likewise, people were found to attribute diminished mental capacities (e.g., fear, self-control, memory) to commonly eaten animals, and direct reminders of the link between meat eating and animal suffering were not gladly received, leading people to further dementalize the animals that they eat (Bastian et al., 2012). Furthermore, participants who were randomly assigned to eat beef jerky later expressed less concern for cows, considered them less worthy of moral status, and rated them as less capable of suffering than those who had been randomly assigned to consume nuts (Loughnan et al., 2010).

Often, when people are asked why they wouldn't eat a particular animal, rather than directly invoking concerns about animal mental states, they respond with a simple "that's disgusting!" Acting as the stomach's gatekeeper, the emotion of disgust is proposed to have evolved to prevent humans from ingesting harmful substances, and is especially sensitive to indicators of blood, excrement, sex, death, and disease (Haidt et al., 1997). Disgust is a critical factor in determining people's willingness to ingest a given food (Rozin & Fallon, 1987), but what particular animal characteristics predict disgust at eating animals? Bastian et al. (2012) demonstrated that perceived mental capacity (a composite of attributes ranging from capacity for pain and fear to emotion recognition) was negatively associated with animal edibility. Beyond characteristics of the animals themselves, Ruby (2008) found that whereas disgust was the strongest negative predictor of people's willingness to eat a range of animals, exposure to animals' meat in stores positively predicted their willingness to eat them, ostensibly because the presence of the meats in stores indicates that other people in one's community are eating them on a regular basis, and that the consumption of such meats is both safe and socially acceptable.

Although culture itself plays a dramatic role in shaping people's food preferences (Rozin, 1990), little is presently known about the factors that underlie people's willingness to eat and feelings of disgust at the thought of eating, animals in non-Western, collectivistic cultures. Indeed, psychology in general has conducted distressingly little research in non-Western cultural contexts (Henrich et al., 2010). Regarding food in general, there is evidence within a number of individualistic Western cultures for a significant, yet small influence of one's family members on one's food choices (e.g., Hursti & Sjöden, 1997; Pliner & Pelchat, 1986; Rozin et al., 1984; Rozin & Millman, 1987). Referring to close others' food choices when deciding what foods to eat should be useful in all cultural contexts, as it stands to reason that commonly eaten foods are likely to taste good, and be reasonably safe to consume. However, there is evidence to suggest that the food choices of close others might hold greater predictive power in other cultural contexts. Within collectivistic cultures, more value is placed on fitting in with close others, and people in these cultures exhibit higher levels of conformity than those from individualistic cultures (e.g., Bond & Smith, 1996; Cialdini & Goldstein, 2004). Past research has shown that relative to Euro-Americans, East Asians based their choices on what others liked (Iyengar & Lepper, 1999; Kim & Markus, 1999), and this trend was mirrored within advertising in popular magazines, such that advertisements in Korean magazines more frequently emphasized themes of conformity and group harmony, whereas American advertisements more commonly utilized themes of uniqueness and individuality (Kim & Markus, 1999). Similarly, recent research on how people from different cultures choose consumer products has indicated that those in Indian cultural contexts are less likely than those from North American cultural contexts to choose according to their personal preferences (Savani et al.,

2008). Thus, the food choices of close others may influence people's own choices to a greater degree in collectivistic cultural contexts.

An examination of the factors that influence people's decisions to eat some animals and avoid others led to the following five hypotheses. First, we predicted that perceived humanlike characteristics of animals (e.g., intelligence, capacity for emotional bonding with humans, capacity for suffering) would positively predict disgust at the thought of eating them. Second, to the extent that a key concern about eating meat is the perceived similarity between animals and humans (e.g., Angyal, 1941; Rozin & Fallon, 1987), we hypothesized that reflecting on animals' humanlike characteristics would lead to increased disgust at the thought of eating them. Third, we hypothesized that disgust would negatively predict people's willingness to eat animals. Fourth, we predicted that social influence (measured by frequency of consumption by friends and family) would positively predict willingness to eat animals. Finally, we predicted that the impact of social influence would be greater among participants from collectivistic cultural backgrounds. Study 1 tests these hypotheses among student samples in Canada and Hong Kong, whereas Study 2 tests them among non-student samples in the USA and India.

Study 3

Method

Six hundred and eight omnivores were recruited from the campuses of the University of British Columbia and the Chinese University of Hong Kong (76 Euro-Canadians, 54% women, $M_{\text{age}} = 25.3$, $SD_{\text{age}} = 8.89$; 532 Hong Kong Chinese, 65% women, $M_{\text{age}} = 20.4$, $SD_{\text{age}} = 1.31$). For their time, all participants were entered into a cash draw. Due to the nature of

the analyses, an additional 56 non-omnivore participants were excluded from analysis (24 Euro-Canadians, 32 Hong Kong Chinese).

Participants completed a survey in which they rated their perceptions of 17 different animals (bear, chicken, cow, crow, dog, dolphin, duck, eel, horse, lamb, monkey, octopus, parrot, pig, rat, shark, and snake). There were two versions of the survey, which manipulated the order in which participants rated their perceptions of the animals to see whether this influences people's thoughts about the animals as potential food. In the *Attributes First* condition, participants first rated each animal's non-food attributes (intelligence, capacity for emotional bonding with humans, capacity for suffering, and appearance: ugly/neutral/cute). In the *Food First* condition, participants first rated each animal's food-related attributes (willingness to eat, disgust at the thought of eating, and frequency of consumption by friends and family). All ratings were done on a 9-point (-4 to 4) Likert scale.

Results and Discussion

To investigate how animals' attributes impact people's feelings about eating them, we predicted disgust from the variables of perceived animal intelligence, capacity for suffering, appearance, squared appearance (i.e., deviation from neutral toward cute or ugly), and capacity for emotional bonding with humans. Standard errors for these, and all subsequent regression coefficients, were calculated via STATA's *vca* cluster operation. This regression procedure assumes independence of responses between participants, and not within-participant responses, and corrects for the fact that each participant has 17 data points per variable (e.g., disgust, appearance, intelligence). All together, these variables significantly predicted disgust for Euro-Canadian ($R^2 = .24, p < .001$) and Hong Kong Chinese ($R^2 = .15,$

$p < .001$) participants. Within both samples, holding all other predictor variables constant, animal intelligence was the strongest positive predictor of disgust, followed by appearance (more disgust at eating ugly animals) and squared appearance (more disgust at eating animals that deviated from the neutral point of the scale). Perceived capacity for emotional bonding with humans emerged as a small yet significant positive predictor, but only among Hong Kong Chinese participants. Finally, perceived capacity for suffering did not emerge as a significant predictor among any of the samples. Thus, of all the aforementioned animal attributes, it seems that perceived intelligence and appearance are the most important predictors of disgust. For standard regression weights and significance levels, see Table 4.

Table 4. Standardized multiple regression coefficients predicting disgust at eating animals in Study 3.

	Euro-Canadian	Hong Kong Chinese
Suffering	0.029	-0.017
Appearance	-0.201***	-0.225***
Appearance ²	0.169***	0.144***
Emotion	-0.041	0.060**
Intelligence	0.509***	0.344***

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

To test our hypothesis that reflecting on animals' attributes increases disgust at the thought of eating them, we conducted a 2 (version) \times 2 (gender) \times 2 (culture) ANOVA on disgust at the thought of eating the animals. The main effect of version was significant, $F(1, 598) = 31.91$, $p < .001$, $d = .69$, such that participants in the *Attributes First* condition reported greater disgust ($M = 1.06$, $SD = 1.14$) than those in the *Food First* condition ($M = .29$, $SD = 1.09$). This suggests that when people are behooved to consider the psychological attributes of an animal, it renders that animal less desirable as a food product. The main

effect of gender was also significant, $F(1, 598) = 49.37, p < .001, d = .86$, such that women reported greater disgust ($M = 1.15, SD = 1.06$) than did men ($M = .19, SD = 1.18$), which is consistent with much past research (e.g., Aunger, 2000; Kubberod, Ueland, Tronstad, & Risvik, 2002; Simoons, 1994). The main effect of culture was not significant ($p = .16$), but culture interacted significantly with both versions, $F(2, 598) = 6.22, p < .02$, and with gender, $F(2, 598) = 18.55, p < .001$. Analysis of simple effects revealed that the gender difference in disgust was more pronounced among Euro-Canadian participants ($p < .001, d = 1.05$) than among Hong Kong Chinese ($p < .001, d = .35$) participants, and the effect of version was also more pronounced among Euro-Canadian participants ($p < .02, d = .56$) than among Hong Kong Chinese participants ($p < .001, d = .39$). This suggests that there are larger gender differences in Euro-Canadians' baseline attitudes toward eating animals, and that reflecting on the psychological attributes of an animal more strongly impacts disgust among Euro-Canadians than among Hong Kong Chinese. This differential impact is concordant with the underpinnings of Western vegetarianism, wherein concern for animal welfare has historically been the primary motivator for people to stop eating animals (Preece, 2008). Hence, Western omnivores might be more preoccupied with the mental states of animals than are omnivores from other cultural contexts. No other interactions were significant.

To test the hypothesized impact of disgust and social influence on participants' willingness to eat animals, and whether these variables operate at different strengths across cultures, we predicted willingness to eat from disgust, social influence (frequency of consumption by friends and family), culture (dummy coded as Hong Kong Chinese: yes/no, with Euro-Canadian as the basis of comparison), and the interactions of culture with disgust

and social influence. The regression was significant ($R^2 = .73, p < .001$), with disgust emerging as a significant negative predictor of willingness to eat ($\beta = -.706, p < .001$), and social influence ($\beta = .194, p < .01$) as a significant positive predictor. Although culture itself was not a significant predictor ($\beta = -.038, p = .13$), culture interacted significantly with both disgust ($p < .001$) and social influence ($p < .001$). To examine these differences, we conducted a multiple regression within each culture, predicting willingness to eat the animals from disgust and social influence. The predictor variables significantly predicted disgust for both Euro-Canadian ($R^2 = .79, p < .001$) and Hong Kong Chinese ($R^2 = .70, p < .001$) participants. Among Euro-Canadians, disgust was a significant negative predictor of willingness to eat ($\beta = -.758, p < .001$), and social influence ($\beta = .140, p < .01$) was a significant positive predictor. Among Hong Kong Chinese, a somewhat different pattern emerged. Disgust was a significant negative predictor of willingness to eat, yet considerably less so than in the Euro-Canadian sample ($\beta = -.416, p < .001$), whereas social influence ($\beta = .493, p < .001$) emerged as a stronger positive predictor. Thus, although disgust and social influence were significant predictors of willingness to eat in both samples, social influence carried relatively more weight in the Hong Kong Chinese sample.

This study supported our hypotheses that the perceived humanlike attributes of animals predict disgust at the thought of eating them, and that reflecting on these attributes increases disgust. Within both cultural groups, disgust was a significant negative predictor of willingness to eat animals, and social influence was a significant positive predictor. As hypothesized, however, social influence had greater predictive power among Hong Kong Chinese than among Euro-Canadian participants. Thus, this study provides initial evidence that the choices of close others may indeed have more of an impact on one's own food

choices in collectivistic cultural contexts. However, this study compared only one individualistic and one collectivistic culture. In an effort to further illuminate our understanding of how people in various cultural contexts resolve the omnivore's dilemma, in Study 4 we moved from student samples in Canada and Hong Kong to more general adult populations in the United States and India.

Study 4

Method

One hundred and eighty-eight omnivores were recruited from Amazon.com's Mechanical Turk testing service (an online, inexpensive, and reliable source of data; Buhrmeister et al., 2011) for a small honorarium (96 Euro-Americans, 57% women, $M_{\text{age}} = 34.1$, $SD_{\text{age}} = 13.49$; 92 Indians, 40% women, $M_{\text{age}} = 29.58$, $SD_{\text{age}} = 7.87$). Due to the nature of the analyses, an additional 123 non-omnivore participants were excluded from analysis (25 Euro-Americans, 98 Indians). Participants completed the same measures as in Study 3.

Results and Discussion

To investigate how animals' attributes impact people's feelings about eating them, we predicted disgust from the non-food variables (viz., perceived intelligence, capacity for suffering, appearance, squared appearance, and capacity for emotional bonding with humans). All together, these variables significantly predicted disgust for Euro-American ($R^2 = .15$, $p < .001$) and Indian ($R^2 = .11$, $p < .001$) participants. Among both samples, holding all other predictor variables constant, animal intelligence was once again the strongest positive predictor of disgust, followed by appearance (more disgust at eating ugly animals) and appearance² (more disgust at animals that deviated from the neutral point of the scale). Contrary to our hypotheses, perceived capacity for emotional bonding with humans emerged

as a significant yet small negative predictor in the Indian sample. Again, perceived capacity for suffering did not emerge as a significant predictor in either sample. Thus, as in Study 3, it appears that perceived animal intelligence and appearance trump the other attributes in predicting disgust. For standard regression weights and significance levels, see Table 5.

Table 5. Standardized multiple regression coefficients predicting disgust at eating animals in Study 4.

	Euro-American	Indian
Suffering	0.031	0.011
Appearance	-0.252***	-0.200***
Appearance ²	0.259***	0.110**
Emotion	0.081	-0.100*
Intelligence	0.267***	0.303***

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

To test our hypothesis that reflecting on animals' attributes increases disgust at the thought of eating them, we conducted a 2 (version) \times 2 (gender) \times 2 (culture) ANOVA on disgust at the thought of eating the animals. The main effect of version was significant, $F(1, 179) = 13.33, p < .001, d = .50$, such that participants in the *Attributes First* condition reported greater disgust ($M = 1.83, SD = 1.38$) than those in the *Food First* condition ($M = 1.17, SD = 1.28$). As in Study 3, this suggests that when people stop to reflect on the psychological attributes of an animal, it renders that animal less desirable as a food source. The main effect of gender was also significant, $F(1, 179) = 9.97, p < .01, d = .42$, such that women reported greater disgust ($M = 1.78, SD = 1.28$) than did men ($M = 1.21, SD = 1.41$). The main effect of culture was also significant, $F(1, 179) = 9.97, p < .01, d = .80$, such that Indians reported greater disgust ($M = 2.01, SD = 1.28$) than did Euro-Americans ($M = .98, SD = 1.28$). Culture interacted marginally with version, $F(1, 179) = 3.20, p = .075$. Analysis

of simple effects revealed that the effect of version was significant among Euro-American participants ($p < .001$, $d = .84$), but not among Indian participants ($p = .38$, $d = .17$). Thus, reflecting on animals' psychological attributes has a greater impact on disgust among Euro-Americans than among Indians, suggesting that disgust at eating meat among Euro-Americans may be more linked to the anthropomorphizing of animals than it is among Indians.

To test the hypothesized impact of disgust and social influence on participants' willingness to eat animals, and whether these variables operate at different strengths across cultures, we predicted willingness to eat from disgust, social influence, culture (dummy coded as Indian: yes/no, with Euro-American as the basis of comparison), and the interactions of culture with disgust and social influence. The regression was significant ($R^2 = .77$, $p < .001$), with disgust emerging as a significant negative predictor of willingness to eat ($\beta = -.796$, $p < .001$), and social influence ($\beta = .124$, $p < .01$) as a significant positive predictor. Culture was a significant predictor ($\beta = -.201$, $p < .001$), with Indians reporting less willingness to eat, and culture interacted significantly with both disgust ($p < .001$) and social influence ($p < .005$). To examine these differences, we conducted a multiple regression within each culture, predicting willingness to eat the animals from disgust and social influence. These variables significantly predicted disgust for both Euro-American ($R^2 = .76$, $p < .001$) and Indian ($R^2 = .74$, $p < .001$) participants. Among Euro-Americans, disgust was a significant negative predictor of willingness to eat ($\beta = -.784$, $p < .001$), and social influence ($\beta = .124$, $p < .01$) was a significant positive predictor. Among Indians, a rather different pattern emerged. Disgust was a significant negative predictor of willingness to eat, yet less so than in the Euro-American sample ($\beta = -.524$, $p < .001$), whereas social

influence ($\beta = .397, p < .001$) emerged as stronger positive predictor than among Euro-Americans. These results parallel those of Study 3, such that disgust and social influence emerged as significant predictors of willingness to eat in both samples, but social influence carried relatively more weight in the Indian sample.

Again, the data supported our hypotheses that the perceived humanlike attributes of animals predict disgust at the thought of eating them, and that reflecting on animals' humanlike qualities significantly increases people's disgust at the thought of eating them. However, there were significant cultural differences, such that Indian participants reported more overall disgust and less willingness to eat than Euro-Americans, and that reflecting on the animals' attributes did not significantly impact their reported disgust. Taken together, these two findings suggest that attitudes toward meat consumption may be more fixed in Indian cultural contexts. As predicted, within both cultural groups, disgust was a significant negative predictor of willingness to eat animals, and social influence was a significant positive predictor. Also as predicted, social influence had greater predictive power in the Indian than in the Euro-American sample, providing further evidence that the influence of close others has a more dramatic influence on one's own food choices in collectivistic cultural contexts.

General Discussion

Across both studies, perceived animal intelligence and appearance trumped all other measured factors, emerging as the chief predictors of disgust at the thought of eating animals. Furthermore, reflecting on animals' psychological attributes increased disgust, especially among Euro-Canadians and Euro-Americans, suggesting that the psychological attributes of

animals may be more relevant in shaping disgust, or that disgust may simply be more malleable, within Euro-Canadian and Euro-American cultural contexts. Concordant with past research, disgust was a major predictor of willingness to eat animals, but social influence (frequency of consumption by friends and family) also emerged as a strong predictor, especially among Hong Kong Chinese and Indians.

Resolving the omnivore's dilemma, especially as it pertains to eating animals, is no trivial task. Although a growing number of people sidestep this particular dilemma by not eating any animals at all (Ruby, 2012), the majority of the world's human population follows an omnivorous diet. Given that people demonstrate a motivation to perceive food animals as less intelligent (e.g., Bratanova, Loughnan, & Bastian, 2011; Plous, 1993), it is fitting that perceived animal intelligence was consistently the strongest predictor of disgust.

Surprisingly, perceived capacity for suffering provided no significant predictive power, and perceived capacity for emotional bonding with humans had minor and inconsistent predictive power, emerging as a weak positive predictor of disgust among Hong Kong Chinese participants, a weak negative predictor of disgust among Indian participants, and not reaching significance at all among Euro-Canadian and Euro-American participants. Thus, of all three potential concerns (that the meat on one's plate may have come from an animal that was intelligent, capable of emotion, and able to suffer), people appear most concerned by the prospect of eating other intelligent beings. This has potential implications for animal welfare organizations, suggesting that their outreach efforts might be more successful if they modify their campaigns to focus on the intelligence of the animals for whom they are advocating. Future research would help determine whether the factors that predict disgust at the thought of eating animals also predict disgust at their general mistreatment. Moving from the

internal to the external, animals' appearance had a consistently strong impact on people's thoughts about eating them – people were more disgusted by eating animals that they perceived to be too ugly or too cute, preferring to eat animals that they considered relatively neutral in appearance. Ostensibly, people maybe be averse to eating the ugly because they strongly dislike their appearance, yet also averse to eating the cute, as they view them in a positive light, and do not want to see them killed and eaten. This finding is concordant with past research on endangered species, such that people reported greater support for the protection of attractive species (Gunnthorsdottir, 2001).

In stark contrast to directly making salient the link between meat and animal suffering, which can lead people to dehumanize the animals they eat (Bastian et al., in press), the present studies demonstrate that having people first reflect on their own perceptions of animals' attributes subsequently increases their disgust at the thought of eating them. Indeed, as these very attributes predict disgust at the thought of eating animals, it is fitting that dwelling on them increases disgust. However, reflecting on the animals' attributes was more impactful on Euro-Canadian and Euro-American participants than on Hong Kong Chinese and Indian participants. Although we are unaware of any other research that has examined cultural differences in the factors that impact meat eating, this differential impact is concordant with the underpinnings of Western vegetarianism, with its primary focus on animal welfare (Preece, 2008). By extension, it is possible that Euro-Canadian and Euro-American omnivores are more preoccupied with the mental states of the animals that they do (and do not) eat than are omnivores from other cultural contexts, or that disgust at the thought of eating animals is simply less malleable in collectivistic cultural contexts.

Concordant with past literature (e.g., Haidt et al., 1997; Rozin & Fallon, 1987), disgust emerged as a strong predictor of willingness to eat the animals across all of the cultural groups. However, we also found broad evidence across all four groups for the predictive power of social influence, as indexed by the eating habits of one's family and friends. Although past research indicates that within individualistic cultural contexts, one's family and friends have relatively little impact on one's food choices (e.g., Hursti & Sjöden, 1997; Pliner & Pelchat, 1986; Rozin, Fallon, & Mandell, 1984; Rozin & Millman, 1987), we found that the food choices of close others held strong predictive power in collectivistic cultural contexts (Hong Kong Chinese and Indians). Although these results are concordant with past research on culture and conformity (e.g., Bond & Smith, 1996; Cialdini & Goldstein, 2004; Kim & Markus, 1999; Savani, Markus, & Conner, 2008), these studies are the first to our knowledge that demonstrate such cultural differences in how people make their food choices.

Replicating much past research (for a review, see Rozin et al., in press; Ruby, 2012), robust gender differences emerged across both studies, such that women were more disgusted than men at the thought of eating animals. In addition to demonstrating gender differences across an array of cultural contexts, these results extend the current literature by providing initial evidence that the magnitude of such differences may vary across cultures. Indeed, these gender differences were especially pronounced among Euro-Canadian participants ($d = 1.05$), compared to gender differences among Euro-American ($d = .57$), Hong Kong Chinese ($d = .35$), and Indian ($d = .33$) participants. Although the Euro-Canadian data were collected at UBC, a rather liberal university in a city where vegetarianism is relatively common, that does not explain the existence of such striking

differences between male and female omnivores. Given that women are generally more disgust-sensitive than men (e.g., Druschel & Sherman, 1999; Haidt et al., 1994; Quigley, Sherman, & Sherman, 1997) and given that our Euro-Canadian participants' disgust ratings were most impacted by reflecting on animals' psychological attributes, it is possible that Euro-Canadian women were especially affected by these concerns. To the best of our knowledge, these studies are the first to reveal such cultural variation in this domain, and future research is needed to unpack the potential reasons for these large differences.

Keeping in mind the narrow cultural scope of the present literature, it is important for future research to be conducted with people from a broad array of cultural contexts, and the current findings raise a number of questions. Given the consistent strength of perceived animal intelligence as a predictor of disgust, it begs the question of whether manipulating people's perceptions of animals' intelligence would also impact their disgust at the thought of eating them. Relatedly, it would be highly informative to investigate perceptions of different animals' mental capacities in countries where they are commonly considered food animals or companion animals (e.g., dogs in Canada vs Korea; horses in the USA vs. Belgium). Moving beyond the question of eating animals, another natural extension of the present research would be to examine what particular characteristics besides physical appearance predict people's concern for endangered species, how this pattern may vary across cultures, and how this could be harnessed to increase public support for their protection.

CHAPTER 4. HOW DO VEGETARIANS AND OMNIVORES DIFFER ACROSS CULTURAL CONTEXTS?

Recent polls indicate that approximately 8% of Canadians (Ipsos-Reid, 2004), 3% of Americans (Cunningham, 2009), and 40% of Indians identify as vegetarian (European Vegetarian Union, 2008). 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 literature on vegetarianism is largely drawn from Western cultures, leaving the cross-cultural generalizability of the literature open to question (Henrich, Heine, & Norenzayan, 2010).

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, 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 et al., 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). Furthermore, research with Dutch samples revealed that vegetarians report more concern than omnivores about the ecological and health consequences of their food choices (Hoek, Luning, Stafleu, & Graaf, 2004). Although research involving vegetarian children is

extremely rare, a study of children living in the USA found that although the vegetarians did not condemn others for eating meat, viewing it as a personal choice, they framed their own dietary choices in moral terms (Hussar & Harris, 2009).

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, people endorsing Universalistic values (e.g., peace, equality, and social justice) were more likely to be vegetarian (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, and Dunne; 2000). 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 US 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).

A logical next step would be to examine how omnivores and vegetarians differ across a broader range of moral domains. For this, we turned to Moral Foundations Theory

(Graham, Haidt, & Nosek, 2009; Haidt & Graham, 2007), which holds that people's moral intuitions can be largely contained in five major domains: Harm (whether or not one's actions directly harm or benefit someone else), Fairness (whether or not one behaves fairly and respects the rights of others), Ingroup (whether or not one shows loyalty to or betrays one's ingroup), Authority (whether or not one demonstrates respect for cultural traditions and legitimate authorities), and Purity (whether or not one controls one's desires, follows standards of purity and decency, and adheres to religious laws). The bulk of research on Western vegetarianism has constrained itself to the domains of Harm and Fairness, such as concern for environmental welfare, animal rights, social justice, and non-violence, and to a lesser extent, the ethic of Authority, such as endorsement of social dominance orientation, hierarchical domination, and respect for tradition (for a review, see Ruby, 2012), but potential vegetarian-omnivore differences in the domains of Ingroup and Purity remain all but unexamined.

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. Furthermore, vegetarians are a minority group in the

West, and sometimes encounter hostility about their dietary choices (e.g., Kellman, 2000; Monin & Minson, 2007). Given this, and the consistent pattern in past research that members of minority groups tend to exhibit more ingroup bias than members of majority groups (e.g., Bettencourt, Miller, & Hume, 1999; Brewer, Manzi, & Shaw, 1993; Brown & Smith, 1999; Simon & Brown, 1987), they would likely be more concerned with the ethic of Ingroup than their omnivorous peers. However, given the relative rarity of religious motivated vegetarianism in Western cultural contexts (Ruby, 2012), Western vegetarians and omnivores should not significantly differ in their concern for the ethic of Purity.

Turning to other cultural contexts, the history of vegetarianism is markedly different. In India, the practice of vegetarianism has been firmly established for centuries, and is associated with tradition, power and status. 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. Relatedly, vegetarianism in India has traditionally been motivated by religious beliefs, and has been chiefly concerned with the domains of asceticism and purity, such that the aim of vegetarianism was 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. Furthermore, although vegetarianism is more mainstream in India than in most other cultures, Indian vegetarians remain a minority group, and as such, may be more concerned with the ethic of Ingroup than their omnivorous peers. However, despite the

longstanding prevalence of vegetarianism in India, the literature is largely mute regarding its psychological associations.

Past research among Western populations has revealed that many people commonly change their motivations for following a vegetarian diet over time, sometimes dropping but often adding reasons (Beardsworth & Keil, 1992; Hamilton, 2006). If Indian vegetarians followed a similar pattern as Westerners, one would predict that although originally motivated by religious and family traditions, Indian vegetarians would later expand their rationale to also encompass concern for animal suffering and environmental welfare. However, work by Rozin et al. (1997) would suggest quite a different motivational trajectory. Among American vegetarians, the initial reasons for abstaining from meat have been shown to shape their motivations many years down the road, such that those who originally became vegetarians out of concern for animal suffering later offered a significantly broader range of motivations for their dietary habits than those who originally became vegetarian out of concern for their health. It is possible that vegetarians originally motivated by a desire to reduce animal suffering are considered more counter-cultural, attracting more ire from others, than those vegetarians who were originally motivated to stop eating meat out of a desire to improve their physical health. In Indian cultural contexts, however, tradition and religion motivate most vegetarians to abstain from meat, and vegetarianism is in harmony with dominant cultural scripts (e.g., Caplan, 2008; Preece, 2008; Spencer, 1993). As such, one would predict that Indian vegetarians would not expand their motives to include heightened concern for the ethics of Harm and Fairness, nor would they be more concerned with animal welfare or environmental sustainability than their omnivorous counterparts.

Given the often problematic nature of direct cross-cultural comparisons of responses to Likert scales (Heine, Lehman, Peng, & Greenholtz, 2002), in both studies we focused on comparisons between dietary groups, and how they differ within cultures. In Study 5 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 6, 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, given the largely religious history of Indian vegetarianism and largely secular history of Western vegetarianism, we predicted higher self-reported religiosity and a heightened concern with the ethics of Purity and Authority among Indian vegetarians, but not among Euro-Canadian and Euro-American vegetarians. Among all surveyed cultural groups, we predicted that vegetarians would be more concerned than omnivores with the ethic of Ingroup.

Study 5

Methods

As part of a larger study on the relationship between people's dietary choices and their attitudes toward social issues, 372 omnivore and vegetarian participants (159 Euro-Americans, 65% Women, $M_{age} = 36.6$, $SD_{age} = 14.27$, 91% Omnivore, 9% Vegetarian; 113

Indians, 40% Women, $M_{age} = 29.1$, $SD_{age} = 8.11$, 58% Omnivore, 42% Vegetarian) were recruited from Amazon.com's Mechanical Turk testing service.⁵ Participants were each paid a small honorarium. There were significant cultural differences in both age, $F(1,269) = 25.31$, $p < .001$, and gender, $\chi^2(1) = 16.59$, $p < .001$.

Participants completed demographic measures and indicated their dietary status (e.g., omnivore or vegetarian). Participants also completed the Ecological Welfare subscale (Lindeman & Väänänen, 2000), which measures people's concern for the impact of their diet on the environment (three items) and animal welfare (two 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

⁵An 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.

to which, on a 6-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 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 had excellent internal reliability: environmental impact, $\alpha = .93$; animal welfare, $\alpha = .93$; Animal Attitudes, $\alpha = .88$; Right-Wing Authoritarianism, $\alpha = .88$; Universalism, $\alpha = .83$.

Results

To test our hypotheses, we conducted a series of 2 (diet) \times 2 (culture) ANCOVAs, controlling for participant age and gender.⁶ 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 ($M = 2.91, SD = 0.94$; see Table 6. The main effect of culture was not significant, $F(1, 260) = 1.53, p = .22$, but the interaction between diet and culture was significant, $F(2, 260) = 9.74, p < .003$. 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 ($p = .92, d = .02$).

⁶ If we do not control for age and gender, the overall pattern of our findings remains unchanged.

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 interaction between diet and culture was marginally significant, $F(2, 260) = 3.43, p = .06$. 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 interaction between diet and culture, $F(2, 261) = 9.19, p < .003$. 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. Finally, 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 ($p = .70, d = .08$).

Finally, 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 interaction between diet and culture, $F(2, 264) = 5.57, p < .02$. 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 ($p = .25, d = .23$).

Table 6. Means and standard deviations of omnivore and vegetarian concern for the impact of food choices, animal welfare, and endorsement of universalism and Right-Wing Authoritarianism.

	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)

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Discussion

Study 5 provides initial evidence that the differences in attitudes and values between vegetarians and omnivores in the West 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, and more concerned with general animal welfare, yet this difference was significant only among Euro-American participants. Among Euro-Americans, vegetarians more strongly endorsed values of Universalism and less strongly endorsed Right-Wing Authoritarianism, yet among Indian participants, vegetarians and omnivores did not significantly differ in either of 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. In Study 6, given that concern for the polluting properties of meat is present among some Western vegetarians (Twigg, 1979), but has traditionally been far more common in Indian cultural contexts (Caplan, 2008; Preece, 2008; Spencer, 1993), we hypothesized that vegetarians would endorse the belief that eating meat is polluting more than would omnivores, but that this belief would be especially pronounced among Indian vegetarians. Similarly, given the prevalence of religiously-motivated vegetarianism in Indian cultural contexts, and the relative rarity of religious vegetarianism in North American cultural contexts (Ruby, 2012), we hypothesized that Indian vegetarians would be more religious than their omnivorous peers, and would demonstrate more concern with the moral domain of Purity, but that Euro-American and Euro-Canadian omnivores and vegetarians would not significantly differ in either their religiosity or concern for 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 Euro-Americans and Euro-Canadians, vegetarians would be less concerned than omnivores with the ethic of Authority, whereas among Indians, vegetarians would be more concerned with this ethic. Given the minority status of vegetarians in all three cultural contexts, we also predicted that vegetarians would be more concerned than omnivores with the ethic of Ingroup. Although the other Moral Foundations were not central to our inquiry, given previous vegetarian-omnivore differences in concern for animal welfare, peace, and social justice, we also predicted that vegetarians would be more concerned than omnivores with the ethics of Harm and Fairness, especially among Euro-Americans and Euro-Canadians.

Study 6

Method

As part of a larger study on the relationship between people's dietary choices and their attitudes toward social issues, 613 omnivore and vegetarian participants (91 Euro-Canadians, 57% Women, $M_{age} = 25.9$, $SD_{age} = 9.13$, 88% Omnivore, 12% Vegetarian; 266 Euro-Americans, 64% Women, $M_{age} = 35.7$, $SD_{age} = 12.94$, 92% Omnivore, 8% Vegetarian; 256 Indians, 33% Women, $M_{age} = 29.3$, $SD_{age} = 8.62$, 72% Omnivore, 28% Vegetarian) were recruited from the University of British Columbia, from postings in online vegetarian groups (e.g., Earthsave, Urbanspoon), and from Amazon.com's Mechanical Turk testing service.⁷

⁷ 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.

Participants from Mechanical Turk were each paid a small honorarium, and all other participants were entered into a cash draw. There were significant cultural differences in both age, $F(2,610) = 37.46, p < .001$, and gender, $\chi^2(2) = 52.49, p < .001$.

Participants completed demographic measures and indicated their dietary status. To measure the belief that eating meat pollutes one's personality and spirit, participants indicated, on a 9-point scale ($-4 = \text{disagree very much}$, $0 = \text{neither agree nor disagree}$, $4 = \text{agree very much}$), 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 ($1 = \text{Not at all religious}$, $7 = \text{Extremely religious}$). Furthermore, participants also indicated how relevant a series of considerations associated with the Five Moral Foundations (Graham et al., 2009) were when deciding whether something is right or wrong: *Purity* ("whether or not someone violated standards of purity and decency", "whether or not someone did something unnatural or degrading"), *Authority* ("whether or not someone showed a lack of respect for legitimate authority"; "whether or not someone respected the traditions of society"), *Harm* (e.g., "whether or not someone was harmed", "whether or not someone used violence"), *Fairness* (e.g., "whether or not some people were treated differently than others", "whether or not someone was denied his or her rights"), and *Ingroup* ("whether or not someone did something to betray his or her group") on a 6-point scale ($1 = \text{never relevant}$, $6 = \text{always relevant}$). All measures had excellent internal reliability; Meat Pollution, $\alpha = .93$; Purity, $\alpha = .87$; Authority, $\alpha = .82$; Harm, $\alpha = .89$; Fairness, $\alpha = .84$; Ingroup, $\alpha = .87$.

Results

To test our hypotheses, we conducted a series of 2 (diet) \times 3 (culture) ANCOVAs, controlling for participant age and gender.⁸ First, we conducted an ANCOVA on endorsement of the belief that eating meat is polluting. The main effect of diet was significant, $F(1, 599) = 72.76, p < .001, d = .97$, such that vegetarians endorsed the belief that eating meat is polluting more ($M = -0.61, SD = 2.56$) than did omnivores ($M = -2.73, SD = 1.76$). The main effect of culture was significant, $F(2, 599) = 50.00, p < .001$, with Indians endorsing these items more than the North American samples, as was the interaction between diet and culture, $F(2, 599) = 5.93, p < .003$ (see Table 7). Analysis of simple effects revealed that among Indians, vegetarians endorsed the belief that eating meat is polluting more than did omnivores ($p < .001, d = 1.46$). This difference between the dietary groups was also significant, but less pronounced, among Euro-Canadians ($p < .001, d = .87$) and Euro-Americans ($p < .001, d = .99$).

Next, we conducted an ANCOVA on religiosity. The main effect of diet was not significant, $F(1, 601) = 0.52, p = .47$, but the main effect of culture was significant, $F(2, 601) = 74.89, p < .001$, with Indians reporting more religiosity than Euro-Canadians and Euro-Americans, as was the interaction between diet and culture, $F(2, 601) = 3.40, p < .04$. Analysis of simple effects revealed that among Indians, vegetarians were significantly more religious than omnivores ($p < .005, d = .43$). Among Euro-Canadians, vegetarians were non-

⁸ 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 becomes marginal ($p = .09$).

significantly more religious than omnivores ($p = .32$, $d = .30$), and among Euro-Americans, vegetarians were non-significantly less religious than omnivores ($p = .21$, $d = .31$).

Next, we conducted an ANCOVA on concern for the ethic of Purity. The main effect of diet was not significant, $F(1, 603) = 0.03$, $p = .87$, but the main effect of culture was significant, $F(2, 603) = 16.10$, $p < .001$, with Indians endorsing these items more than the North American samples, as was the interaction between diet and culture, $F(2, 603) = 5.36$, $p < .005$. Analysis of simple effects revealed that among Indians, vegetarians endorsed the ethic of Purity significantly more than omnivores ($p < .001$, $d = .52$), but the dietary groups did not significantly differ among Euro-Canadians ($p = .65$, $d = .12$) or Euro-Americans ($p = .12$, $d = .41$).

Next, we conducted an ANCOVA on concern for the ethic of Authority. The main effect of diet was not significant, $F(1, 603) = .16$, $p = .69$. The main effect of culture was significant, $F(2, 603) = 21.30$, $p < .001$, with Indians endorsing these items more than the North American samples, as was the interaction between diet and culture, $F(2, 603) = 5.09$, $p < .01$. Analysis of simple effects revealed that among Indians, vegetarians endorsed the ethic of Authority significantly more than omnivores ($p < .01$, $d = .43$), among Euro-Americans, vegetarians endorsed it marginally less than omnivores ($p = .07$, $d = -.44$), and among Euro-Canadians, the dietary groups did not significantly differ ($p = .70$, $d = .11$).

Next, we conducted an ANCOVA on concern for the ethic of Ingroup. The main effect of diet was significant, $F(1, 603) = 3.94$, $p < .05$, $d = .29$ such that vegetarians endorsed the ethic of Ingroup more ($M = 4.13$, $SD = 1.06$) than did omnivores ($M = 3.80$, $SD = 1.18$). The main effect of culture was significant, $F(2, 603) = 5.20$, $p < .01$, with Indians

endorsing these items more than the North American samples, but the interaction between diet and culture was not significant, $F(2, 603) = 1.04, p = .35$.

Next, we conducted an ANCOVA on concern for the ethic of Harm. The main effect of diet was significant, $F(1, 603) = 10.17, p < .002, d = .45$, such that vegetarians endorsed the ethic of Harm more ($M = 5.13, SD = 0.87$) than did omnivores ($M = 4.67, SD = 1.14$). The main effect of culture was significant, $F(2, 603) = 3.73, p < .03$, with the North American samples endorsing these items more than the Indians, as was the interaction between diet and culture, $F(2, 603) = 3.72, p < .03$. 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 Indians ($p < .001, d = .85$) and marginally significant among Euro-Americans ($p = .06, d = .43$), but not significant among Euro-Canadians ($p = .83, d = .06$).

Finally, we conducted an ANCOVA on concern for the ethic of Fairness. The main effect of diet was significant, $F(1, 603) = 11.87, p < .002, d = .53$, such that vegetarians endorsed the ethic of Fairness more ($M = 4.87, SD = .80$) than did omnivores ($M = 4.36, SD = 1.10$). The main effect of culture was marginally significant, $F(2, 603) = 2.81, p = .06$, but the interaction between diet and culture was not significant, $F(2, 603) = 0.11, p = .89$.

Table 7. Means and standard deviations of omnivore and vegetarian belief that meat is spiritually polluting, religiosity, and concern for the Five Moral Foundations.

	Euro-American		Indian		Euro-Canadian	
	Omnivore	Vegetarian	Omnivore	Vegetarian	Omnivore	Vegetarian
Meat Pollution	-3.09 (1.46)***	-1.50 (2.03)***	-1.83 (1.96)***	1.35 (2.28)***	-3.31 (1.16)***	-1.65 (2.26)***
Religiosity	2.86 (1.94)	2.31 (1.58)	4.59 (1.84)***	5.30 (1.46)***	2.13 (1.53)	2.65 (1.84)
Purity	3.60 (1.34)	3.13 (.89)	3.85 (1.10)***	4.38 (.95)***	3.52 (1.19)	3.32 (1.98)
Authority	3.45 (1.10)†	2.99 (1.01)†	3.82 (1.08)**	4.24 (.88)**	3.57 (.90)	3.44 (1.49)
Ingroup	3.67 (1.28)	3.74 (.97)	3.88 (1.08)***	4.39 (1.01)***	3.85 (1.04)	4.22 (1.34)
Harm	4.88 (.98)†	5.29 (.88)†	4.12 (1.28)***	5.04 (.84)***	4.94 (.77)	5.00 (1.12)
Fairness	4.47 (1.04)*	4.98 (.65)*	4.05 (1.21)***	4.64 (.83)***	4.53 (.88)	4.94 (.81)

Note: *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$.

Discussion

As predicted, vegetarians endorsed the belief that eating meat pollutes one's personality and spirit more strongly than did omnivores, and this difference was especially pronounced among Indians. Also as hypothesized, Indian vegetarians were more religious and more concerned with the ethic of Purity than were their omnivorous counterparts, but the differences between dietary groups were not significant among Euro-Canadians and Euro-Americans. Although Euro-Canadians and Euro-Americans did not significantly differ in self-reported religiosity, the differences between dietary groups were of approximately the same effect size as in the Indian sample, suggesting that a more highly-powered investigation of the links between vegetarianism and religiosity in North American cultural contexts might uncover significant differences. Furthermore, as predicted, Indian vegetarians were more concerned with the ethic of Authority than were their omnivorous counterparts, yet among Euro-Americans, vegetarians were less concerned with this ethic, and among Euro-Canadians, the difference between dietary groups was not significant. In all three cultural groups, vegetarians were more concerned than omnivores with the ethics of Ingroup, Harm,

and Fairness, with the curious exception of Euro-Canadian omnivores and vegetarians not significantly differing in reported concern for the ethic of Harm.

General Discussion

Across two studies, we have provided evidence that vegetarians and omnivores differ from one another in distinct ways, depending on the cultural context in which they live. As with past research conducted in the West, we found that Euro-American and Euro-Canadian 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, more strongly endorsed Universalistic values of peace, equality, and social justice, and were lower in endorsement of Right-Wing Authoritarianism than their omnivorous counterparts. However, among Indian participants, these differences were not significant. In stark contrast, Indian vegetarians were especially likely to endorse the belief that eating meat is spiritually polluting, whereas Euro-Canadian and Euro-American omnivores and vegetarians differed to a much lesser extent. Furthermore, Indian vegetarians were more religious than their omnivorous counterparts, whereas Euro-Canadian and Euro-American omnivores and vegetarians did not significantly differ in religiosity. Relatedly, when deciding whether something is right or wrong, Indian vegetarians were more concerned than omnivores with the ethic of Purity (e.g., disgust, standards of decency, virtue, and keeping one's desires under control), but Euro-Canadian and Euro-American vegetarians and omnivores did not significantly differ in this domain. Indian vegetarians were more concerned than their omnivorous peers with the ethic of Authority (e.g., showing respect for authority, fulfilling the duties of one's role, and respecting the traditions of society), whereas among Euro-Americans, vegetarians were less concerned with the ethic of Authority than were

omnivores. These results are concordant with the historical associations in India between vegetarianism and social status and tradition, and the associations of vegetarianism with counter-culture movements in the USA. Unexpectedly, there was no significant difference in concern for the ethic of Authority among Euro-Canadians. In sum, Indian and North American vegetarians reached their dietary preferences via different paths.

Although vegetarians differed drastically across cultural contexts in the above domains, we found evidence for similar omnivore-vegetarian differences in concern for other ethical domains across cultures, such that vegetarians placed more weight than their omnivorous counterparts on the ethics of Ingroup (e.g., loyalty, acting in the interests of one's group), Fairness (e.g., treating others equally, recognizing people's rights), and Harm (e.g., avoiding harm, caring for the vulnerable), with the exception of no significant vegetarian-omnivores differences among Euro-Canadians in their concern of the ethic of Harm. Although we expected differences in Harm and Fairness to be larger among our Euro-Canadian and Euro-American samples, it appears that Indian vegetarians are also more concerned with whether humans are being harmed or treated unfairly, although Study 5 suggests that this concern does not extend to non-human animals.

A potential limitation of the present research is that the Indian data are drawn only from participants recruited via Mechanical Turk. Although Mechanical Turk has been shown to be a reliable source of data (Buhrmeister et al., 2012), it is possible that these participants were more westernized and middle class than many of 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. 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. Given that, relative to their omnivorous counterparts, Euro-Americans vegetarians appear to have less regard for authority, and Indian vegetarians more regard for authority, one could examine the extent to which they would comply with unreasonable experimenter demands, such as completing a letter search task in a 50-page document. If Indian vegetarians have a stronger preference for tradition, they might also be less willing than their omnivorous peers to eat (vegetarian) food from other cultures. Conversely, given the associations of North American vegetarianism with counter-culture, North American vegetarians may be more interested in exploring novel (vegetarian) cuisine.

Taken together, the present studies suggest that the psychological associations of vegetarianism are more nuanced than they have been previously described, with different themes emerging across cultural contexts. 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 Western vegetarians, but better advised to focus on the domains of purity and tradition when advertising to Indian vegetarians. However, it appears that appeals to themes of loyalty and taking care of close others may be effective advertising strategies when addressing both Western and Indian vegetarians.

CHAPTER 5. GENERAL DISCUSSION

This dissertation set out to investigate a series of three core questions that probe how people in different cultural contexts resolve the omnivore's dilemma. These three research questions were raised in the introduction of this dissertation. Below I review how the data presented in this dissertation address these questions.

Summary of Results

Do visual reminders of animals origins reduce willingness to eat novel meats?

This dissertation began by examining whether visual reminders of animal origins would impact people's willingness to eat novel meats. As predicted, visual reminders reduced people's willingness to eat novel meats across both Euro-Canadian and Asian-Canadian student samples, and Euro-American and Indian community samples. Concordant with past literature on meat and masculinity (e.g., Adams, 1991; Simoons, 1994), there were strong and consistent gender effects, such that women from all of the cultural contexts were less willing to eat novel meats than were men.

Also as predicted, visual reminders of animal origin did not significantly impact willingness to eat meats from commonly eaten animals, whom many omnivores consider relatively unworthy of moral concern (Bastian et al., 2012; Joy, 2009). It is possible that stronger reminders of the link between meat and animal, such as showing people footage of the slaughter and meat-packing process, might also reduce people's willingness to eat commonly consumed animals.

What factors predict willingness to eat animals?

The next chapter of this dissertation examined what factors influence people's decision to eat some animals and not others. Across both studies, perceived animal intelligence and appearance emerged as the chief predictors of disgust at the thought of eating animals. Concordant with recent findings that people demonstrate a motivation to perceive food animals as less intelligent (e.g., Bratanova et al., 2011; Plous, 1993), it is perhaps unsurprising that perceived animal intelligence was the strongest predictor of disgust. In stark contrast, perceived capacity for suffering provided no significant predictive power, and perceived capacity for emotional bonding with humans had minor and inconsistent predictive power, suggesting that of all three potential concerns (that the meat on one's plate may have come from an animal that was intelligent, capable of emotion, and able to suffer), people appear most concerned by the prospect of eating other intelligent beings. Furthermore, animals' appearance greatly impacted people's feelings about eating them, such that they were more disgusted by eating animals that they perceived to be too ugly or too cute, preferring to eat animals that they considered relatively neutral in appearance. Although the exact mechanisms underlying these preferences are not yet explored, people may avoid eating ugly animals out of simple disgust, yet also avoid eating cute animals, as they consider them to be more likeable, and therefore more worthy of moral concern. This finding is concordant with past research on endangered species, such that people reported greater support for the protection of attractive species (Gunnthorsdottir, 2001).

Furthermore, reflecting on animals' psychological attributes increased disgust, particularly among Euro-Canadians and Euro-Americans, suggesting that the psychological attributes of animals may be more relevant in shaping disgust, or that disgust may simply be

more malleable, within North American cultural contexts. Replicating past research, disgust was a major predictor of willingness to eat animals, but social influence (frequency of consumption by friends and family) also emerged as a strong predictor, especially among Hong Kong Chinese and Indians, suggesting that the influence of close others has a more pronounced influence on one's food choices in collectivistic cultural contexts. Although these results are concordant with past research on culture and conformity (e.g., Bond & Smith, 1996; Cialdini & Goldstein, 2004; Kim & Markus, 1999; Savani et al., 2008), these studies are the first to our knowledge that demonstrate such cultural differences in how people make their food choices.

Replicating much past research (for a review, see Rozin et al., in press; Ruby, 2012), robust gender differences emerged across both studies, such that women were more disgusted than men at the thought of eating animals, and these gender differences were especially pronounced among Euro-Canadian participants. Given that women are generally more disgust-sensitive than men, and given that our Euro-Canadian participants' disgust ratings were most impacted by reflecting on animals' psychological attributes, it is possible that Euro-Canadian women were especially affected by these concerns.

How do vegetarians and omnivores differ across cultural contexts?

Finally, this dissertation examined differences between vegetarians and omnivores in North American and Indian cultural contexts. As with past research conducted in Western societies, we found that find that North American vegetarianism is primarily associated with concern for the impact of daily food choices on the environment and animal welfare, and with concern with overall animal welfare. Furthermore, North American vegetarians more

strongly endorsed Universalistic values of peace, equality, and social justice, and more strongly rejected Right-Wing Authoritarianism than their omnivorous counterparts. However, Indian vegetarians and omnivores did not differ in their concern for any of these domains.

Among our Indian participants, vegetarians were especially likely to endorse the belief that eating meat is polluting, and were more concerned with the ethic of Purity (e.g., maintaining standards of decency and virtue, controlling one's desires). Although North American vegetarians also endorsed the belief that eating meat is polluting to a greater extent than did North American omnivores, these differences were significantly smaller than among Indians, and North American omnivores and vegetarians did not differ in their concern for the ethic of Purity. Furthermore, Indian vegetarians reported greater concern for the ethic of Authority (e.g., showing respect for authority, respecting the traditions of society), whereas among Euro-Americans, vegetarians reported less concern for the ethic of Authority. These results are concordant with the historical associations of vegetarianism in the examined cultural contexts, such that vegetarianism has been associated with social status and tradition in India, but with counterculture movements in the USA. Unexpectedly, Euro-Canadian omnivores and vegetarians did not significantly differ in their concern for the ethic of Authority, suggesting that linkages between vegetarianism and counterculture movements may be weaker in Canada.

Alongside cultural differences in vegetarianism, Studies 5 and 6 suggested that omnivores and vegetarians in both North American and Indian cultural contexts may share some common differences. Across all investigated cultural groups, vegetarians placed more

weight than their omnivorous counterparts on the ethics of Ingroup (e.g., loyalty, acting in the interests of one's group), Fairness (e.g., treating others equally, recognizing people's rights), and Harm (e.g., avoiding harm, caring for the vulnerable), with the exception of no significant differences among Euro-Canadians in their concern for the ethic of Harm.

Although we have predicted that differences in Harm and Fairness would be larger among North Americans, it appears that Indian vegetarians also pay more attention to whether someone is being harmed or treated unfairly, although Study 5 suggests that this concern does not extend to non-human animals. That vegetarian-omnivore differences in concern for the ethic of Ingroup emerged in both Indian and North American contexts is also particularly notable, as this ethic has thus far been associated with political conservatism, suggesting that the moral intuitions of vegetarians and omnivores are more nuanced than simple liberal/conservative inclinations.

Implications

This dissertation has several implications. First, the reported findings support past theory on the role of psychological distancing in meat consumption (e.g., Beardsworth, 1995; Plous, 1993; Simoons, 1994). Although people's attitudes toward commonly eaten meats appear to be more established, and not significantly affected by simple visual reminders of animal origins (i.e., pictures of the animals in question), Studies 1 and 2 demonstrate that visual reminders of the animal origins of novel meats reduces people's willingness to eat them. These effects were obtained with participants from North American, Hong Kong Chinese, and Indian cultural contexts, suggesting that the impact of reducing the psychological distance between meat and animal may not be culturally specific. Given the impact of showing people simple pictures of animals whose meat is being served, it is likely

that showing people an in-depth account of the slaughter process would further diminish the psychological distance between animals and meat, and more strongly impact willingness to eat them. Indeed, key players in the meat industry appear to be well aware of this, as illustrated by recent legislation that made it a criminal offense to conduct undercover recording of animal abuse in livestock facilities in Iowa (Associated Press, 2012) and Utah (Gehrke, 2012).

Second, the findings reported in this dissertation indicate that out of a host of potential concerns about the internal states of the animals they eat (e.g., that they could possess high levels of intelligence, capacity for emotion, experience pain and suffering), people were particularly disgusted at idea of eating other intelligent beings. These results of Studies 3 and 4 complement recent research by Bratanova et al. (2011), which demonstrates that people are motivated to dementalize the animals that they commonly eat. In stark contrast to recent work by Bastian et al. (2012), who found that directly reminding people of the link between meat and animal suffering can lead people to dementalize the animals they eat, we demonstrated that people became especially disgusted at the thought of eating animals after reflecting on the animals' psychological characteristics.

Third, Studies 3 and 4 indicate that the process of deciding which animals one eats unfolds quite differently across cultural contexts, and reinforce the call for more research to be conducted in non-Western cultural contexts (e.g., Arnett, 2008; Henrich et al., 2010). Among our North American participants, disgust was the most important factor in predicting people's willingness to eat a range of animals, and reflecting on these animals' internal attributes significantly increased the amount of disgust that they felt about eating them. Concordant with past research within Western cultural contexts (e.g., Hursti & Sjöden, 1997;

Pliner & Pelchat, 1986; Rozin et al., 1984; Rozin & Millman, 1987), the eating habits of participants' friends and family predicted willingness to eat animals to a lesser extent. Among our Hong Kong Chinese and Indian participants, however, the eating habits of friends and family more strongly predicted willingness to eat, and reflecting on the animals' psychological characteristics impacted disgust to a lesser extent than among our North American participants. Thus, it would appear that personal food preferences and aversions are more important to the daily food choices of people living in individualistic, North American cultural contexts, whereas normative pressures from close others appear to be more important to those living in collectivistic East Asian and Indian cultural contexts.

Across North American, Hong Kong Chinese, and Indian cultural contexts, women were less willing to eat meat than men, and more disgusted at the thought. Notably, these gender differences especially pronounced among Euro-Canadians in Study 4. Given established gender differences in disgust sensitivity (e.g., Druschel & Sherman, 1999; Haidt et al., 1994; Quigley, Sherman, & Sherman, 1997), and given that our Euro-Canadian participants' disgust ratings were most impacted by reflecting on animals' psychological attributes, it is possible that Euro-Canadian women were especially affected by concern with animals' internal states, and therefore especially unwilling to eat them. Turning to our Hong Kong Chinese and Indian samples, however, gender differences in disgust and willingness to eat meat were considerably smaller.

Finally, Studies 5 and 6 further underscore the role of culture in shaping people's food choices and associated attitudes. Extending the present literature, which has found that Western vegetarianism is generally associated with concern for animal and environmental welfare, universalistic values, and anti-authoritarianism (for a review, see Ruby, 2012), we

found that Indian omnivores and vegetarians did not significantly differ in their concern for these domains. Rather, Indian vegetarians were more concerned with the potentially polluting effects of eating meat, and more concerned with the role of purity, sanctity, authority, and tradition in their everyday decision-making. Although these studies are but an initial foray into unpacking cultural differences in vegetarianism, they suggest that there is much to be uncovered by more in-depth investigations across a broader array of cultural contexts. On the other hand, Studies 5 and 6 suggest that vegetarianism may have some common associations across cultures, such that both North American and Indian vegetarians were more concerned with loyalty and with acting in the best interests of the group, and with preventing harm to other human beings.

The present research has direct implications for the marketing of food products in different cultures. Studies 1-4 suggest that, as people become more aware of the particulars of meat production, and as research on animal emotion and personality grows in popularity (e.g., Bekoff, 2007; Gosling, 2001; Joy, 2009), demand will increase among omnivores for more humanely raised meat, and for vegetarian food products that emulate the taste and texture of meat, without involving actual animal slaughter. Indeed, numerous initiatives to create such products have garnered a large amount of media attention (e.g., Hsu, 2012; Strnadel, 2011). Turning to a different market, Studies 5 and 6 suggest that advertisers of food products may be more successful appealing to concerns about environmental sustainability and animal welfare when targeting Western vegetarians, but better advised to focus on the domains of purity and tradition when advertising to Indian vegetarians. However, it appears that appeals to themes of loyalty and taking care of close others may be effective advertising strategies when addressing both Western and Indian vegetarians.

Limitations

This dissertation has shed light on how people in different cultural contexts resolve the omnivore's dilemma, but it is not without its limitations. First, it is important to acknowledge that Studies 1 and 3 were conducted solely within undergraduate student samples. As Henrich et al. (2010) have recently warned the field, research conducted solely with Western undergraduate student samples represents a narrow slice of humanity, and findings with such samples should not be overgeneralized. With these concerns in mind, we conducted replications with online community samples in Studies 2 and 4, and Studies 5 and 6 drew on a mixture of student and community samples. Furthermore, as it was an explicit goal of the dissertation to examine how people resolve the omnivore's dilemma in different cultural contexts, every study included at least one non-Western sample.

In Studies 5 and 6, following the pattern of most past research on vegetarianism, we had difficulty recruiting even a modest number of male vegetarians. As such, comparisons of male and female vegetarians across cultures would have relied on extremely small cells. Given this, and given that there were significant differences in both age and gender between cultures in both studies, we chose to control for the effects of age and gender in our analyses. It is important to note, however, that although inclusion of these covariates strengthened our results, our reported pattern of results remained the same when these covariates were not included.

Another potential limitation of the present research is that the Indian data are drawn only from participants recruited via Mechanical Turk. Although Mechanical Turk has been shown to be a reliable source of data (Buhrmeister et al., 2012), 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. Furthermore, it is important to note that all measures of people's disgust and willingness to eat animals in Studies 1-4 were self-reports. Because of the difficulty that would be involved in actually preparing a buffet of exotic animals, in Studies 1 and 2 we enlisted the aid of someone with years of experience in the restaurant industry to imbue ample psychological realism into the mock menus that we employed as study materials (see Appendix 1). We appear to have succeeded, as evidenced by the fact that numerous participants asked us from which restaurants we gleaned the menu items. However, given past work on hot-cold empathy gaps (e.g., Loewenstein, 2005) – that people have difficulty assessing the impact of “hot” future states, such as hunger, when they are in a “cold” state – it is possible that people might be considerably more willing to eat the novel dishes if they were actually given the opportunity.

As with the vast majority of research on differences between omnivores and vegetarians (with the notable exception of the fMRI study conducted by Filippi et al., 2010), Studies 5 and 6 also shared the same potential limitation of relying on participant self-report of their attitudes and values. Indeed, it would be highly informative to examine whether the obtained cultural differences in vegetarianism would also be observed with more behavioral measures (e.g., participation in environmental activism, volunteering at animal shelters, relative percentage of organic produce purchased in a month).

Future Directions

This dissertation also lays the groundwork for several lines of future research. One way to expand the current inquiry would be to examine the impact of stronger reminders of the link between meat and animal, such as familiarizing people with the slaughter and meat-

packing process. Initial evidence for this comes from Hormes et al. (2011) who found that reading Michael Pollan's (2006) *The Omnivore's Dilemma*, which details many of the practices of the meat industry, subsequently reduced American students' willingness to eat meat. It remains to be seen whether this information would have a comparable impact on people in other cultural contexts, and whether presenting people with video stimuli instead of text (e.g., clips from *Food, Inc.*, or *Earthlings*) would more strongly impact their meat-related attitudes and behaviors.

While Studies 3 and 4 demonstrate that perceived animal intelligence is a powerful predictor of disgust at the thought of eating them, research has yet to determine whether directly manipulating people's perceptions of animals' intelligence would impact their disgust at the thought of eating them. Similarly, it is an open question whether people perceive particular animals to have diminished mental capacities in societies where they are commonly considered food animals, yet enhanced mental capacities in societies where they are commonly viewed as companion animals (e.g., dogs in Canada vs. Korea; horses in the USA vs. Belgium). Moving beyond the domain of food, another natural extension of the present research would be to build on the work of Gunnthorsdottir (2001), examining what particular characteristics besides physical appearance predict people's concern for endangered species, how this pattern may vary across cultures, and how this could be harnessed to increase public support for their protection.

Given people's aversion to eating animals that they consider intelligent, and that omnivores are motivated to dementalize commonly eaten animals, it stands to reason that vegetarians may anthropomorphize animals to a greater extent than do omnivores. Indeed, recent research by Bilewicz et al. (2011) found that, relative to omnivores, vegetarians

ascribed more “uniquely human emotions” to animals (e.g., melancholy, regret, nostalgia). Furthermore, relative to vegetarians, omnivores considered commonly eaten animals less capable of complex mental and emotional states. However, as with the vast majority of research on vegetarianism, this research was conducted with Western samples. Given that Indian vegetarians and omnivores did not differ in their concern for animal welfare, it is possible that omnivore-vegetarian differences in the domains of dehumanization and anthropomorphism may be particular to Western cultures, and not present in Indian cultural contexts.

Delving deeper into the cultural differences in vegetarianism that were demonstrated in Studies 5 and 6, a natural extension would be to examine the implications of differences in vegetarian and omnivore concern for the Moral Foundations. Both Indian and Euro-Canadian vegetarians showed a pronounced concern for the ethic of Ingroup, but what behavioural differences might one expect? For example, one could examine behavior in an economic decision-making paradigm, such as a variant of the “Dictator Game,” in which a participant would decide how to divide a sum of money between themselves and other participants (Camerer, 2003). Relative to omnivores, would vegetarians allocate more money to a participant that they have been led to believe is a member of their ingroup, and if so, which types of ingroup status would be sufficient? Would it be enough for the other participant to share something relatively innocuous, such as similar taste in movies and music, or would the effects of ingroup favoritism only be observed along the lines of dietary status, such that vegetarians would preferentially allocate resources to other vegetarians? As noted by Allport (1954) and later by Brewer (1999), favoring members of one’s ingroup does not necessarily translate into hostility toward outgroups. Indeed, work by Monin and Minson

(2007) suggests that such hostility may be smaller than one would expect— omnivores expected that vegetarians would feel significantly more moral reproach toward them than was actually the case. Thus, if vegetarians did indeed allocate more resources to purported vegetarians than to purported omnivores, it would also be informative to examine the extent to which this differential allocation was driven by attitudes toward vegetarians and attitudes toward omnivores.

Another natural extension of Studies 5 and 6 would be to examine how vegetarians and omnivores in different cultural contexts react to the actions of authority figures. Given that, relative to their omnivorous counterparts, Euro-Americans vegetarians appear to have less regard for authority, and Indian vegetarians more regard for authority, one could examine the extent to which they would comply with unreasonable experimenter demands, such as completing a letter search task in a 50-page document. If Indian vegetarians have a stronger preference for tradition, they might also be less willing than their omnivorous peers to eat (vegetarian) food from other cultures. Conversely, given the associations of North American vegetarianism with counter-culture, North American vegetarians may be more interested in exploring novel (vegetarian) cuisine. Going beyond the realm of food, it is possible that differences in traditionalism may also translate into attitudes toward sex and sexuality, such that Indian vegetarians would hold less favorable views of alcohol and recreational drug use, homosexuality, pre-marital sex, and sex with multiple partners than would Indian omnivores, whereas the opposite pattern would hold for North Americans. Although Sadalla and Burroughs (1986) found that Americans did indeed perceive vegetarians to be more sexual and more inclined to use recreational drugs, to the best of my knowledge, these empirical questions remain unanswered.

The ethic of Purity is by definition quite broad, assessing people's concern for disgust, religious laws, standards of decency, the natural order, and self-control. Although North American vegetarians and omnivores did not significantly differ in their endorsement of this ethic, one might find differences in measures that directly assess concern for the purity of what one eats – e.g., a preference for organic over conventionally grown foods, and for whole over highly processed foods. Indeed, the popularity of organic food has been steadily rising, among omnivores and vegetarians alike (Hughner, McDonagh, Prothero, Schultz, & Stanton, 2007), and the factors that predict people's purchase and consumption of organic food remain ripe for study. For example, it could well be that by only consuming organic, free-range meats, a subset of omnivores resolve concerns about food safety and animal suffering, thus finding the same level of psychological comfort with their diets that ethically-motivated vegetarians do with theirs. On a more general level, it could be that those who predominantly consume organic food are more concerned with the purity of what they eat than those who predominantly consume conventionally grown food. Furthermore, if people share intuitions about why people are motivated to follow a predominantly organic diet, they should be likely to draw inferences about their personality and character, as they have been shown to do in response to the perceived healthiness of others' diets (e.g., Barker, Tandy, & Stookey, 1999; Fries & Croyle, 1993; McPhail, Chapman, & Beagan, 2011; Stein & Nemeroff, 1995). Here, culture would remain a critically important factor– indeed, recent research has shown that in British Columbia, Euro-Canadians referred very frequently to ethical consumption when discussing their food choices, whereas Punjabi-Canadians were virtually silent on this topic, talking instead about various aspects of culinary tradition (Beagan, Ristovski-Slijepcevic, & Chapman, 2010). Moreover, this tendency to focus on

issues of tradition, rather than ethical consumption, was also found among Euro-Canadians living in Nova Scotia, suggesting that within a larger cultural context, local cultural norms can be more influential than national ones. A particularly interesting contrast between Moral Foundations Theory (Graham et al., 2009, Haidt & Graham, 2007) and Social Domain Theory (e.g., Nucci & Turiel, 1993; Turiel, 1983) is the scope of what each theory considers relevant moral issues. Although Moral Foundations Theory holds that a very wide range of issues can be considered moral behaviors, Social Domain Theory only considers issues that would fall under the ethics of Harm and Fairness to be in the moral domain, relegating concerns inherent to the ethics of Authority, Ingroup, and Purity to the realms of convention and personal choice. Cross-cultural research has shown that while people in many cultural contexts generally regard issues of harm and welfare to be moral issues, Indians are more likely to consider issues such as interpersonal obligations and social norms to be matters of legitimate moral concern, whereas North Americans are more likely to consider them to simply be matters of convention or personal choice (e.g., Miller & Bersoff, 1992; Miller, Bersoff, & Harwood, 1990). Although classic Social Domain theory would relegate one's food choices to the conventional or personal domain, given that concerns for animal welfare often underlie vegetarianism the West, it is very possible that vegetarians would be more likely than omnivores to consider one's food choices a matter of moral concern. That said, there would likely be variation in attitudes between types of vegetarians, such that those primarily motivated by reasons of personal health would be more likely to consider what one eats to be a matter of personal choice, rather than a moral issue. Turning to Indian cultural contexts, where religion and tradition are the major motivators of vegetarianism, it is also

likely that omnivores and vegetarians would differ in the extent to which they considered one's food choices a matter of legitimate moral concern.

Although direct cultural comparisons of attitudes toward animal welfare were not a focal point of this dissertation, in Study 5, we found that Euro-Americans were significantly more concerned with the general welfare of animals. Furthermore, in Study 4, we found that reflecting on animals' psychological attributes made Euro-Americans more disgusted at the thought of eating them, whereas Indians' disgust levels were not significantly impacted by this manipulation. Taken together, these two studies suggest that there may indeed be cultural differences in concern for overall animal welfare. Such potential differences could be further probed by examining more concrete indicators that would be immune to the reference group effect (Heine et al., 2002), such the existence and extent of animal welfare legislation, animal shelters, animal rescue societies, anti-vivisection groups, the prevalence of family vs. factory farms, and sales figures for fur and leather clothing.

Final Conclusion

While a growing body of literature has examined the psychology of meat eating and vegetarianism, the vast majority of it has been conducted solely with Western participants. This dissertation was designed to extend upon the extant body of research by addressing three core questions across a broad array of cultural contexts. Broadly speaking, the findings presented here suggest that people psychologically distance themselves from the animal origins of meat, and that this distance is less easily reduced for commonly eaten animals, whom people are accustomed to considering unworthy of moral concern. However, people are especially averse to eating animals that they perceive to be intelligent, and when they reflect on their perceptions of the psychological attributes of animals, they become more

averse to the idea of eating them, especially within North American cultural contexts.

Furthermore, there appear to be fundamental cultural differences in those who eschew meat eating altogether, such that Western vegetarianism is primarily associated with concerns for environmental welfare, animal suffering, and liberal values, whereas Indian vegetarianism is primarily associated with concerns for purity, pollution, authority, and tradition. Taken together, these findings provide greater insight into how people resolve the omnivore's dilemma in different cultural contexts, and the implications this carries for their attitudes, beliefs, and behavior.

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APPENDIX 1 MENU FOR STUDIES 1 & 2

Adobo-Rubbed Penguin Steaks: Penguin steaks are rubbed with a spice blend featuring dried orange peel, paprika and allspice and marinated overnight. They are pan-seared and oven-roasted to perfection and served with a cilantro-mint sauce on the side.

Barbeque Monkey Ribs: Exotic monkey ribs are basted in sweet and tangy tamarind-guava barbeque sauce.

Belgian Steak-Frites: A Belgian delicacy, this filet mignon of horse is char-broiled and served with a cognac peppercorn sauce and Belgian fries.

Black Bird Bastilla: Based on a traditional Moroccan recipe. Tender morsels of crow breast are cooked with saffron, cinnamon and ginger, and layered in creamy custard studded with crunchy sweetened almonds. A crisp and paper-thin pastry shell encloses the sweet and savory ingredients.

Butter Chicken: A classic East Indian dish of boneless chicken simmered in a sweet and spicy tomato cream sauce.

Double Smoked Pork Chop: This thick free-range pork chop is brined and smoked in-house, then grilled up tender and juicy over mesquite on the barbeque.

Fox Satays with Peanut Sauce: A black vinegar and brown sugar marinade makes these fox skewers extra tender. Sweet and spicy, easy to eat finger food.

Hopping Popping Rice Bowl: A flavorful explosion of Szechuan seasoned wok-fired vegetables and rice tossed with crunchy bits of chili-salt fried crickets.

Isaan Bandicoot: Crispy wok-fried strips of bandicoot rat tossed in a sweet hot chili sauce.

Maafe: This recipe of parrot and vegetables braised in spicy peanut sauce comes from Mali in Africa.

Osso Bucco Aussie-Style: Medallions of kangaroo are seared with garlic and herbs and then slow-roasted with artisan-made chorizo, roasted red peppers and tomatoes.

Peppercorn Crusted Rack of Lamb: A bistro classic tweaked with a star anise infused demi-glace.

Prime Rib: Grade A Alberta Beef Prime Rib is specially aged for extra flavor and tenderness, rubbed with our unique blend of spices and slow roasted.

Thai-Style Coconut Curried Hound: Rich coconut curry with lemon grass and basil infuses tender slices of hound. Served in a fresh pineapple boat on top of jasmine scented rice.