

**Animal Ethics and Evolutionary Psychology**

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## **Abstract**

Moral consideration (empathy, compassion) is most readily available for kin and family, who are most relevant to our selfish genetic interests. But, in recent history we have seen an expansion of moral concern (Pinker, 2011) to those in our community and ingroup and sometimes to outgroup members. Ethicist Peter Singer calls this "The Expanding Circle" (2011). However, the expansion of the circle of moral concern for sentient nonhuman animals has lagged behind consideration for humans, and the animal advocacy movement has lagged behind civil rights movements (H. Herzog, 2010; Pinker, 2011). There is good evidence that nonhuman vertebrates like cows, chickens, fish, and mice are sentient, meaning they are capable of feeling pain and suffering. Humans use trillions of sentient animals every year for food, clothing, and research. Billions of these animals are bred in industrial agricultural production that maximizes the efficient output of meat, eggs, and dairy in ways that cause pain and distress. Most people in the world cause animal suffering directly or indirectly every day (Ritchie & Roser, 2017) and only a small percentage of people ('vegans') boycott animal products for ethical reasons. This moral minority comes disproportionately from western educated industrialized rich democracies (WEIRD). Valuation of humans over animals is a fundamental human moral universal (Awad et al., 2018), but also there is extreme inconsistency and variability in human attitudes and behavior towards animals (H. Herzog, 2010). Evolutionary psychology can help explain our moral blind spots towards animals, and our moral inconsistencies in their treatment. In particular, we are kinder to animals who elicit kinship cues and cuteness responses. Disgust is also an important factor in vegetarianism and meat eating. Tragically, disgust may cause us to switch to animal foods that cause greater net suffering. Moral behavior doesn't occur in a vacuum, and much of our moral inconsistency emerges from our 'virtue signaling' -- how we advertise our moral virtues to others. I will argue that moral progress in improving lives for animals cannot rely on individuals using their own initiative to transcend their appetites and evolved psychology. We cannot expect that individuals will engage consistently morally. We might have to decide collectively to remove consumer decisions (like choosing to eat cheap factory-farmed chicken) that pit rational morality against our intuitive evolved morality. Evolutionary psychology can help us understand our moral limitations and, perhaps, how to surpass them.

Key Words: Animal Ethics, Evolutionary Psychology, Anthrozoology, Morality

## **Introduction**

Evolutionary psychology examines the human mind through the lens of evolution to understand the functions of our psychological adaptations such as motivations, emotions, and cognitions. Humans have many interactions with nonhuman animals (hereafter just “animals”, although the term “nonhuman animals” makes an important philosophical point), most of which are fairly recent (e.g., cats as companion animals), but some go much further back in our history (e.g., hunting animals for food). We use animal bodies for fur, meat, lactation, eggs, labor, and scientific study; the scale of animal use is enormous, in the trillions each year (Wiblin & Bollard, 2017). In the last few hundred years, the average level of human suffering has decreased dramatically, but the total amount of animal suffering due to human actions has skyrocketed. We can see all around us examples of individual humans being exceedingly altruistic to favored animals, but also industrialized cruelty towards less-favored animals at an incomprehensible scale. While we should have no expectation that human morality will be rational or consistent, this chapter grapples with the fact that our treatment of animals deviates very far from any coherent, rational morality. In terms of overall ‘suffering footprint’, human maltreatment of animals is by far the biggest ethical issue in the world, and evolutionary psychology can give us deep insights into both the problem and possible solutions.

## **Animal Ethics**

Animal ethics has different meanings among groups of philosophers, scientists, and the public. Examining how our evolutionary psychology obscures consistent ethics requires some consideration of what would serve as an ethical baseline for comparison (Fleischman, 2018). Views about human obligations to animals, or lack thereof, have proliferated in philosophy. Some philosophers argue it’s wrong to own animals or use them in any way (Francione, 2015), whereas others argue that we have no obligation to animals because they cannot make social contracts and are thus not part of our moral community (Machan, 2004). Of all the mainstream philosophical approaches to animal ethics, utilitarianism and consequentialism have been more positively disposed to morally consider animals than other frameworks (Frey, 2011).

Utilitarianism defines what is good as what maximizes happiness or pleasure and minimizes suffering, across all sentient beings (those capable of experiencing happiness or suffering) (Greene, 2013). This chapter rests on the basic evolutionary insight that vertebrate animals like mammals and fish evolved the capacity to feel pain and pleasure, and thus the capacity to suffer. Further, it rests on a normative moral stance that sentience should be the basis for moral consideration, that suffering is bad, and that reducing suffering is good. However, I do not rely on any concept of “animal rights”, nor do I assume that using animals as a means to human ends is always immoral

(Regan, 2004), although these ideas likely have their own interesting evolutionary psychology. For my normative moral claim that suffering is bad and alleviating suffering is good, most philosophers appeal to the reader's personal experience with suffering, or take the idea that suffering is bad as obvious ("a priori" or "axiomatic") (but see also Kahane, 2009). Evolutionary theory has influenced many to adopt an ethical stance that we should ascribe moral standing and consideration on the basis of the ability to suffer (Singer, 2011), otherwise known as "sentientism" (Ryder, 1991; "Sentientism," 2019). This chapter analyzes where our evolutionary psychology is consistent with and deviates from sentientism as a moral baseline.

### **Evidence for Animal Sentience**

How can we establish which animals are sentient, and therefore deserving of moral consideration? Sentience is the ability to experience pain and pleasure subjectively. First let's distinguish between the ability to react to tissue damage, and the ability to suffer. Nociception, or the experience of pain, is the simple and ancient capacity of most animals to respond to injuries that cause tissue damage. Nociception is specific to animals with a nervous system, but even simpler organisms may have a similar capacity to respond to harmful stimuli (Tomasik, 2018b). Behavioral evidence of nociception is, for example, a shrimp grooming an injured antenna (Elwood, 2011) or, physiologically, the measurement of neurons firing in response to sensory stimulation (Braithwaite, 2010). Sentience and the ability to suffer is the subjective awareness of pleasure and pain and can be demonstrated when the response to stimuli is more complex than a simple response to physical damage (Braithwaite, 2010; Elwood, 2011).

Considering an evolutionary and functional perspective, we can infer that subjective awareness of suffering evolved to prevent and manage bodily damage. If we take as given that humans can suffer, and suffering has important adaptive functions in preserving our phenotypes, it's parsimonious to assume that sentience and suffering evolved in other related animals, including many other vertebrates (Tomasik, 2017). There is a solid foundation of evidence that vertebrates and even some invertebrates evolved both nociception and sentience (Braithwaite, 2010). Vertebrates as a group generally have the same neurons, synapses, and other neural hardware associated with the ability to feel pain found in sentient humans. Fish brains, once thought to lack the fundamental hardware of sentience, have been found to have a brain region similar to the limbic system such that they may have the ability to "process information with an emotional component" (Braithwaite, 2010, p. 102).

Animal responses to pain, such as soliciting help, and avoiding stimuli previously associated with pain, are behavioral evidence of sentience. Many studies have shown that invertebrates -- widely thought to be incapable of sentience -- show responses consistent with subjective awareness

of pain. For example, hermit crabs have been shown to make adaptive tradeoffs when exposed to shock, choosing to endure more painful shock in a high quality as opposed to a low quality shell (Appel & Elwood, 2009). Trout given a painful injection in their lips failed to show the normal neophobic response to a novel stimulus (a colorful block tower), compared to trout in the control condition; the trout's distraction from normal behavior because of pain suggests a subjective awareness of pain, and thus suffering and sentience (Braithwaite, 2010; Sneddon et al., 2003). Using crabs and fish as examples is instructive, because they show better objective evidence for suffering than human neonates do (Braithwaite, 2010, p. 153) – but babies would almost certainly be more likely to get the benefit of our doubt. This is not to say that fish are *equally sentient* with cats, dogs, babies, or adult humans. There are many potentially good reasons to prioritize some animals over others by virtue of their greater ability to suffer, but the influence of, for example, brain size on degree of potential suffering, are beyond the scope of this chapter (see Tomasik, 2019)

The vast amount of sentience that evolved across millions of species in our world – and the resulting potential for suffering across trillions of animals – can feel overwhelming. But that doesn't mean it isn't true – and evolutionary psychologists have been courageous in confronting other emotionally challenging, counter-intuitive truths. Evolution may have created endless forms most beautiful, but it would never have passed an ethics review board (Bostrom, 2016, p. 188). Evolutionary psychologists should take seriously the likelihood that evolution favors widespread sentience across species, but not widespread altruism to other species, and this sets the stage for a planet filled with sentient suffering once humans achieved the technological means to exploit other species on an industrial scale.

### **Natural Born Speciesists**

There are two central questions with regards to human morality towards animals: Why do we value animals less than humans morally, and why are our moral attitudes towards animals so inconsistent? Both moral anthropocentrism and speciesism describe the concept of valuing human lives over animal lives, although speciesism implies that this valuation is a form of prejudice due to mere species membership (Caviola, 2019). Most people value members of certain species above and beyond their ability to suffer, for example valuing insensate humans (like those in a persistent vegetative state) more than chimpanzees, and valuing dogs more than pigs, even though they are similarly sentient. Valuing humans over animals seems to be a human moral universal. In one study, millions of participants all over the world overwhelmingly choose to save the life of a human over an animal, or several animals (Awad et al., 2018). In another study, participants most often chose to save one human over the lives of several endangered animals (like gorillas) (Petrinovich et al., 1993). This valuation is only partially reversed if the animal at risk is *their pet*. When Topolski et al. (2013)

asked participants who they would save if a bus was imminently going to hit their pet or a foreign tourist, 40% chose to save their pet. “The only consistency in the way humans think about animals is inconsistency” (H. Herzog, 2010, p. 14). Arguably it can be rational to prioritize some interests over others on the basis of sentience, but humans are not doing any coherent form of ethical calculus when they choose actions or decide on the morality of those actions.

Is there an inherent human moral response towards animals? The study of how humans and animals interact has taken off in the last two decades with the rise of anthrozoology, also known as human-animal relations (Amiot & Bastian, 2015; H. Herzog, 2010; Serpell, 1996). Anthrozoology is a diverse field, investigating topics like the therapeutic properties of living with dogs, the possible link between animal abuse and criminal behavior, and the personality traits of animal rights activists (H. Herzog, 2010). These fields have often tried to explain human moral anthropocentrism and moral inconsistency with descriptive frameworks like carnism (the social ideology that supports meat eating) (Joy, 2011), moral disengagement (i.e. we distance ourselves from our humane standards to harm animals) (Bandura, 1999; Vollum et al., 2004), terror management theory (i.e. we cling to human uniqueness and animal oppression to avoid existential anxiety) (Marino, 2019), and speciesism (discrimination based on species membership) (Caviola et al., 2018; Singer, 1995). Explanations at a functional levels of analysis (Scott-Phillips et al., 2011) and adaptationist accounts are less common in anthrozoology (although see Bradshaw & Paul, 2010; H. Herzog, 2002).

Evolutionary psychology is compatible with most of the explanations of human morality towards animals advanced by anthrozoologists. Evolutionary psychology posits functional explanations for attitudes and behaviors as reflecting evolved psychological adaptations (or their byproducts). Explanations like speciesism and cultural explanations like carnism are not in conflict with evolutionary psychology (Tooby & Cosmides, 1989), because culture is both an outgrowth of and a support for our evolved morality (e.g., the cultural celebration of consensual courtship and maternal love). However, the assumption of some thinkers in anthrozoology, as well as many animal welfare advocates, is that humans are naturally sensitive and morally concerned about animal suffering, but this innate goodness is numbed by cultural and social factors like carnism (Joy, 2003) and moral disengagement. The consistent thread in these perspectives is that violence is deeply unnatural. However, from the perspective of evolutionary morality, we should not expect sensitivity to animal suffering or kindness to animals except to the extent that it helped us, for example when using use animals for our benefit, or to signal our morality.

### **Anthropomorphism**

Anthropomorphism, or ascribing human characteristics to animals, is an apparently universal feature of the human mind (Urquiza-Haas & Kotrschal, 2015). Anthropomorphism is so naturally

expressed that it's difficult to think about animals in non-anthropomorphic, objective terms. Most children don't make clear distinctions between humans and animals, and young children usually treat animals, like family pets, as human persons (Serpell, 1996).

Ironically, the basis for much of our moral feelings towards animals likely evolved so we could better exploit, kill, and eat them. Humans and animals aren't so different, so the same theory of mind and empathy that helps us predict what humans do can also be used when hunting prey animals or avoiding predators. Primatologists and other animal behavior scientists often use simple anthropomorphism to make predictions because "it works"; Behaviorist John Garcia stated that anthropomorphism with regard to rat behavior "works better than most learning theories" (Serpell, 1996, p. 174). When you're using the mind-reading ability that mostly evolved to predict the behavior of other people, you're bound to ascribe human characteristics to animals. The ability to imagine what it was like to be an animal had adaptive benefit to better predict the behavior of prey, predators, and dangerous animals (H. Herzog, 2002). It's also possible that empathy could have motivated nurturance for domesticated species in animal husbandry (Bradshaw & Paul, 2010). However, it's unlikely this empathy would evolve to any degree that would interfere with the resource-exploitation processes of killing, butchering, and eating animals. If empathy is like a spotlight that illuminates the suffering of some at the expense of others (Bloom, 2016), this spotlight turns off or moves on. Empathy isn't consistently associated with caring about animal ethics (Kasperbauer, 2015). And biophilia, or the desire to affiliate with nature and animals (Wilson, 1984), often doesn't have a loving or caring character.

### **Play and animal abuse**

One clue about evolved human morality towards animals is how readily humans will torment animals when it isn't necessary, and how much they enjoy doing it. Play is an essential part of learning in our species and many others. But humans playing with animals often involves both curiosity and cruelty (Arluke, 2002). Around the world, in both traditional societies and Western societies, playing with animals and cruelty to animals are commonplace in both adults and children – not just in psychopaths.

Read some anthropological descriptions of hunter-gatherers and you'll see sentimental, Noble Savage views like this: "Children learn to sympathize with animals and to see animals as sentient persons sharing the forest world with them" (Lew-Levy et al., 2017, p. X). The implication is that hunter-gatherers have greater moral regard for animals than Western people who only see meat in wrapped in cellophane at the grocery store. However, read descriptions from thinkers who are less attached to a Noble Savage narrative, and you'll get a better picture of how difficult it may be for our species to bestow moral consideration on others.

It's common for people in more traditional societies to hurt animals for fun. Jared Diamond describes Papua New Guinean men amusing themselves by raising and lowering squealing bats into a fire and dissecting them alive for their bones (Diamond, 1993).

Men and boys are much more likely to abuse animals than women and girls (Arluke, 2002) but this passage about Nisa, a Kung! San woman, describes with unusual clarity the dynamic of curious, playful cruelty, and its ability to facilitate precise prediction of animals:

A flying ant with a long, wormlike body and large, almost transparent wings...landed in the hot sand...Nisa saved it.... and pierced it through half the length of its body with a thin twig, leaving the upper half with the wings and head free. She planted the stick, with the skewered insect at the top, upright in the ground and tapped it gently with her fingers. The insect's wings burst into motion, as if in flight, propelling the free parts of its body around and around the stick; then it stopped. Nisa tapped the stick again and again; each time, the insect responded with the same outpouring of energy....What Nisa was doing.... seemed like an inexcusable torture....[But, Nisa's] head and the upper per parts of her body had begun to move rhythmically. I did not understand what she was doing at first. Then it became clear: as the insect held itself erect, Nisa's body also became erect; when the insect circled, drooped, and strained, Nisa's body did the same. Her face and torso echoed the insect's plight with a wrenching subtlety and her mimicry of its every movement was so sympathetic that the situation took on a kind of beauty (Shostak & Nisa, 2004, p. 321).

Using animals for entertainment has been one of the most contentious and moralized aspects of animal use, even though the scale of suffering involved is much smaller than most modern industrialized forms of animal use. For example, many countries that otherwise have few animal protection laws have banned circuses ("These 27 Countries Have Banned Wild-Animal Circuses!," 2019). Bear-baiting, hare-coursing, dogfighting and cockfighting are more controversial than other types of animal use, and were banned much earlier (e.g., the UK banned bear-baiting in 1835 and Pakistan banned bear-baiting in 1890). This seems to be an area of strong moral signalling.

One reason modern people might be judgemental about animal entertainment is because of the glut of other entertainment media developed in the last few centuries, especially those like chamber music and foreign films that signal refined taste and moral sensitivity. Yes, using animals for entertainment is unnecessary, but it seems even less necessary and thus indulgently cruel when so many other forms of entertainment are available, especially other forms of violent entertainment like combat sports and video games. Forms of animal entertainment considered lowbrow or "primitive" may be more controversial. For example, many have argued that forms of animal

entertainment enjoyed by the working class, like cockfighting, have been banned more quickly and more often than those enjoyed by the higher classes, like fox hunting (“Fox hunting,” 2019).

Most of us in Western societies who would not want to torment an animal directly, or would be appalled to see staged animal suffering intended for entertainment, are still entertained by watching animals inflict suffering on each other in the wild, for example, in nature documentaries. The disparity in sensibilities is also well illustrated in this anecdote:

That is perhaps the hardest part of being an anthropologist. [The hunter-gatherers I was studying] sensed my weakness and would sell me all kinds of baby animals with descriptions of what they would do to them otherwise. I used to take them far into the desert and release them, they would track them, and bring them back to me for sale again! (Pinker 2011, p. 473).

These behaviors that cause suffering to animals are often practiced alongside making offerings to animal deities, praying to the spirit of animals after killing them, and efforts to embody animal qualities -- contrary to the notion that cruelty requires dehumanization or suspension of empathy. In many small-scale societies, formalized animal totemism often co-exists with informal animal torment. The majority of human groups include some conspicuous cruelty to animals, but there are exceptions. For example, Jain monks and nuns sweep the ground in front of them so as to avoid inflicting any suffering on insects (“Ahimsa in Jainism,” 2019) – but it’s notable that this requires strong spiritual and social incentives, such as the belief that any given human might be reincarnated as an insect. Given our evolutionary history as omnivores, and the ubiquity of animal abuse across cultures, it seems likely that carnism and speciesism are outgrowths of our evolved psychology, rather than historically novel cultural influences that render us weirdly insensitive to animal suffering.

#### **Animal abuse by children- The Link**

Children commonly inflict suffering on animals, not just out of necessity, but for enjoyment and curiosity. Here again, we see the sentimental narrative that animal abuse is a rare, pathological glitch in children’s fundamentally caring natures, and that children who abuse animals will grow up to have other serious problems like psychopathy and criminality. Animal abuse is considered a risk factor for violence with such certainty in the animal advocacy community that it’s sometimes referred to simply as “The Link” (H. Herzog, 2010). Most of the evidence for an association between childhood animal abuse and adult violence suffers from methodological limitations like retrospective reporting, and sampling incarcerated criminals (Flynn, 2011). But, consistent with the idea that insensitivity to animal suffering is fairly standard in our species, there isn’t replicable evidence that

animal abusers are more likely to commit violent crime (H. Herzog & Arluke, 2006; Patterson-Kane & Piper, 2009).

Consistent with the cross-cultural ubiquity of animal cruelty, and the historical commonality of using animals for entertainment, animal abuse is normal among young humans. In one study, 40% of female college students and 66% of male college students admitted to having abused animals (Arluke, 2002) – and given the modern stigma against animal abuse, this is probably an underreported behavior. There seems to be a moral panic about animal abuse; advocates often depict anyone who has ever abused an animal as likely to commit violence against people, even though the majority of people have, at some time, abused an animal (Patterson-Kane & Piper, 2009). Children might be learning about how animals “work” by playing with them, developing mental models of animal morphology and behavior that ancestrally would have been useful for hunting, tracking, and butchering. Indeed, vertebrate animals’ similarity to humans means that children may be learning more than this. Children around the world often practice caretaking with pets and baby animals. We can speculate that violence, which is also sometimes adaptive, can be practiced and honed through similarly by playing with animals or through cruelty.

Indeed, lacking the kinds of modern toys that Western children have access to, animals are used in just this way, treated with both care and cruelty. “Anthropologists have observed returning hunters bringing small wild animals back alive and promptly turning them over to their children...these animated toys are generally badly treated, short lived and ...end up the objects of target practice or mutilation” (Serpell, 1996, p. 68). There are two main hypotheses about the animal cruelty association with crime: the graduation hypothesis posits that animal abuse is “a form of rehearsal for human-directed violence”, and the deviance generalization hypothesis posits that antisocial personality is associated with both animal cruelty and criminal behavior (Gullone, 2014). Animal cruelty might be both a normal behavior that children perform if unsupervised with animals, and also a form of practice that is disproportionately attractive to children with antisocial and violent tendencies.

Animal killing and butchering were surely features of our evolutionary history, but only in the modern economy are there specialized workers who spend hour after hour killing and butchering animals. Even among slaughterhouse workers, the worker who kills the cow, the “knocker”, is considered to have psychological problems compared to other workers who bleed the cow or begin to dismember it (Pachirat, 2014). There is evidence that the presence of slaughterhouses is associated with increased local rates of violent crime and sexual offences, relative to other industries like steel forging (Fitzgerald et al., 2009), but it’s unclear if violent people are

more attracted to working in slaughterhouses, or if slaughtering animals increases workers' propensities for violence towards other humans.

### **Why has animal advocacy lagged behind other moral movements?**

Civil rights movements like those for the abolition of slavery, black power, women's rights, worker's rights, and gay rights have flourished in the last several decades and have reduced suffering for billions of humans (Pinker, 2011). The animal advocacy movement (including animal rights, animal welfare, and animal liberation – but not environmental protection) has not had the same success as other sentient rights movements (Pinker, 2011). In some ways, attitudes have changed a great deal. In a representative sample of over 1,000 American adults, Sentience Institute found that nearly 50% supported a ban on slaughterhouses and factory farming (Reese, 2017). But, in that same survey, 75% of participants believed the reassuring fiction that the animal products they were eating had been humanely produced (Reese, 2017). A recent Gallup poll found that 32% of Americans think that animals deserve “the exact same rights as people” (Riffkin, 2015), up from 25% in 2003 (Moore, 2003). A study of 3,500 Ohio residents found 81% said farm animal welfare was as important as pet welfare, and 75% said farm animals should be protected from physical pain (Rauch & Sharp, 2005). These self-reported attitudes are impressively progressive, but consumer behavior has not changed that much. For example, few Americans boycott animal products. The rate of self-identified vegetarians has hovered around 5% in the USA for several years (Riffkin, 2015). Other reports claim there are slightly more vegetarians, but it doesn't matter that much, because only about 1/3 of self-described vegetarians abstain from meat (Cooney, 2014). Che Green, an expert on these trends, has called vegans and vegetarians “a blip on the demographic radar” and “below the margin of error for most surveys” (Zaraska, 2016, p. 136).

The concern for animal wellbeing has made uneven progress, with far more concern about some species and some issues than others. One illustration of the vast disparity between the alleged human moral concern for animal suffering, and the actual concentration of animal suffering, is revealed by patterns of charitable donations (see Figure 1). Farm animals, compared to all other animals, experience the vast majority of suffering and death. More than 99% of farm animals live on factory farms (Reese, 2019). Farm animals received only \$20 million in charitable donations in 2015, compared to \$1.2 billion donated to animal shelters for pet species like dogs and cats (Bockman, 2016). “Of domesticated land animals used and killed by humans in the United States, over 99.6% are farmed land animals, about 0.2% are animals used in laboratories, 0.07% are used for clothing, and 0.03% are killed in companion animal shelters. However, about 66% of donations to animal charities in the United States go to companion animal shelters, 32% go to groups with mixed or

other activities, and just 0.8% of donations go specifically to farmed animal organizations, while 0.7% go to laboratory animal organizations” (Bockman, 2016).



Figure 1

A couple caveats are that the “other” category does include some farm animal donations, because it includes large organizations that engage in diverse animal advocacy campaigns (e.g., People for the Ethical Treatment of Animals). “Other” also includes environmental charities and wildlife preservation. Also, importantly, the “animals used and killed” number does not include fish, which would completely dominate the left panel. Fish are probably killed in the trillions, at a rate greater than all other animals combined (Mood & Brooke, 2010). If humans cared about reducing animal suffering, they would be boycotting commercial fishing and factory farms, not donating to cat and dog shelters.

Below I will address the psychology of how and why humans morally value and devalue animals. First, I’ll discuss kin selection, and the empathy elicited by cuteness and neoteny – two intertwined factors that account for our kindness towards companion animals like dogs and cats. Second, I’ll discuss disgust and food aversion, meat consumption, and the future of meat-eating. Empathy, disgust, and food preferences show significant sex differences, and I’ll discuss how they manifest in morality. Lastly, I’ll talk about how morality is socially signaled, and how this virtue signaling plays out in animal care and attitudes towards the animal-focused moral minority, such as

vegans. The view of decision-making in the moral domain in this chapter is consistent with the popular metaphor of the elephant and the rider (Haidt, 2012; Simler & Hanson, 2017). Emotions and psychological mechanisms like disgust, empathy, reputation management, and the cuteness response guide our moral decisions in often irrational directions, like an elephant deciding which path to take. We identify as the rider, the part we are most conscious of, and we later attribute our moral decisions to rational processes rather than the “hot” emotional cognition of the elephant, the part that controls our behavior.

### **Kin Selection and the Cuteness Response**

Prominent anthrozoologist James Serpell defines pets as “animals we live with, with no obvious function” (H. Herzog, 2010, p. 72). Other animals don’t usually keep pets. Cross-species friendships sometimes happen (see viral videos of cats who love rats and hippos who love tortoises, for example), but they are almost always the product of an artificial environment (H. Herzog, 2014). Pet-keeping seems uniquely human. Two interesting exceptions in the wild are a dolphin who adopted a melon-headed whale (Carzon et al., 2019), and a marmoset adopted into a group of capuchin monkeys (Izar et al., 2006). In the first case, the dolphin nursed and cared for the whale, and in the second case, two female capuchins provisioned the marmoset. In both cases, arguably, the adopted animal appears to be a neotenous version of the animals’ own young. This illustrates a major psychological means through which humans integrate animals more centrally into their moral worlds: kin selection and empathy for cuteness. Both cases also illustrate how this cuteness-based empathy is more motivating for females than for males. We keep a wide variety of pets, from insects to horses, but here I’ll focus mostly on dogs, who seem to be the animals most likely to reverse human speciesism.

The psychological mechanisms motivating kin selection may cause humans to value dogs and cats much more than other comparably sentient animals. Evolution promotes passing on our genes, including in other members of our families (Foster et al., 2006). Because cooperating in groups is adaptive, we may be more likely to interpret ambiguous cues as evidence of genetic association (Park & Ackerman, 2011). In this way, kin selection means that we tend to be more altruistic to those who show cues of being members of our ingroup – whether these cues are cultural (Kurzban et al., 2001) or physical (Krupp et al., 2011). There are other possible indicators of genetic relatedness, like psychological similarity (Park & Schaller, 2005), and time spent growing up together (Lieberman et al., 2007).

It’s unclear if there is a specific psychological architecture for friendship, or if our minds are simply indiscriminate about what cues we take as indicators of genetic relatedness. Some animals indisputably occupy a familial role, not only in Western countries but also among many hunter-

gatherers. New Guineans, which I earlier described torturing bats, treat pigs as members of their families; piglets sleep in the same hut with their human families and New Guinean women often nurse piglets at the breast (Diamond, 1993). In the USA, 91% of dog and cat owners reported that their pet was a part of their family, and 20% of dog owners report giving their dogs birthday gifts (“Pets Really Are Members of the Family,” 2011).

We attend to physical similarity when evaluating species and breeds for special treatment. For example, people are more likely to support causes to save endangered species that have more in common with humans, like great apes, and researchers who do invasive scientific experiments on monkeys are most likely to be threatened by animal activists (H. Herzog, 2010). Even so, most people (around 75%) would choose to save one person over five endangered lowland gorillas (Petrinovich et al., 1993).

Dogs show resemblance to humans in their facial musculature: domestication has changed dog faces compared to wolf faces to be able to display more humanlike expressions (Kaminski et al., 2019). There is also evidence that people resemble their dogs (Nakajima et al., 2009), and that people choose dogs who resemble them (Roy & Nicholas, 2004). People also tend to think their dogs are psychologically similar to them. Dog breeds go in and out of fashion (Ghirlanda et al., 2013), but the proliferation of so many dog breeds with different appearances and personalities may have been driven by the kin selection mechanisms of different individuals and ethnic groups with different implicit criteria for similarity.

### **Cute Ethics**

“In ethics, cuteness doesn’t count” (Cohen, 2009).

Because pets seem to occupy a place in the family as surrogate children, cues of kinship (genetic similarity) and cuteness are difficult to disentangle as contributors to this unusual moral relationship. Because there is no word in English for the especially cute emotional repertoire elicited by cuteness, I’ll use “cuteness response”. The cuteness response elicits nurturance but also inspires mentalizing and anthropomorphizing, bringing cute individuals closer into the circle of moral concern (Sherman & Haidt, 2011). There is evidence that pets, especially dogs, parasitize our parental caretaking mechanisms (Turner, 2001). People even talk to dogs in a way similar to “motherese” (the sing-song way in which parents talk to their infants), and this has been termed “doggerel” (Hirsh-Pasek & Treiman, 1982). Dogs are also neotenous: they retain puppylike features throughout their lives. Furthermore, dogs who have more paedomorphic (i.e. cute) facial musculature are more likely to be adopted from shelters (Waller et al., 2013). Dogs in childless homes are much more likely to be groomed, given presents, and taken on vacation (Herzog, 2010, p. 79).

Dogs have been bred to retain neotenous puppylike features and to be cuter than their wolfy ancestors. Dogs aren't just cuter to us; they're also cuter to wolves themselves! In one study a wolf mother was given two different litters to foster, one with wolf puppies and one with dog puppies:

The foster-mother wolf was...more nurturant with the Malamute pups than with the wolf pups. She washed them earlier and more frequently, spent 2-3 times as many hours in the den-box with them as she did with the wolf pups, was more defensive toward intruders, showed far more distress when one was missing (e.g. during supplemental feedings), played with them and continues to play with them for longer periods of time (Frank & Frank, 1982, p. 515)

One reason that dog breed popularity doesn't track health, obedience, or other desirable qualities is the desire that many people have for the cuteness super-stimulus. Analyzing the popularity of dog breeds in the USA from 1926 to 1995, researchers concluded that there was no indication "that breeds with more desirable behavior, longer life, or fewer inherited genetic disorders have been more popular than other breeds" (Ghirlanda et al., 2013, p. 4). This probably has something to do with the lust for cuteness. Most purebred dog breeds have some endemic health problems, but brachycephalic dogs (dogs with short snouts, like bulldogs) have many more problems. This preference for that irresistible brachycephalic cuteness super-stimulus causes a huge amount of suffering for animals that are otherwise treated like family. French and English bulldogs must usually be delivered by C-section, and suffer many other problems like allergies, hip dysplasia, persistent farting, and heat sensitivity that causes them to die more often in transport (K. Herzog, 2019). Interestingly, people with these neotenous breeds are more attached to their pets than those with less neotenous breeds. In a Danish sample, French bulldog owners were more attached to their dogs and nearly 20% more likely to say "I would do anything for my dog" compared to owners of the much less neotenous Cairn Terriers (Sandøe et al., 2017). Perhaps these health problems—which require extraordinary attention and care—are a reason why people want these dogs (Serpell, 2019). Bulldogs have been in the top five for breed popularity for the last six years, and in the last two years, French bulldogs have also been in the top five. With the recent high-profile win of "Thor", a bulldog, at a national dog pageant, this trend is likely to continue (K. Herzog, 2019).

To some extent, our special affinity for our pet dogs translates into special moral consideration for all dogs. In the USA there was widespread outrage prompted by China's annual dog meat festival (Howard, 2016). America has loved dogs for a long time – and, in perhaps the greatest success story from the animal protection movement, the number of dogs (and cats) that are euthanized per year has plummeted, down 75% from 2011 (Parlapiano, 2019).

Why do we as humans find a huge array of animals cute, from penguins to pandas to pangolins? Prototypical cuteness elicitors are cues like round and fat cheeks, large eyes, small teeth, and playful energetic behavior. Our own young don't achieve peak cuteness until they are several months old (Sherman & Haidt, 2011). Humans produce very altricial young and neonates are highly divergent in their appearance (e.g., presence of hair, redness of skin, facial morphology). Also, neonates often aren't cute, and yet, this stage of life is when our young are most vulnerable and most in need of care. In order to take care of our own neonates, the normal primate standards of cuteness may have become relaxed in humans. Earlier I speculated that slightly indiscriminate kin detection mechanisms could have made it easier for humans to form friendships. Something similar could have happened with cuteness and pets. The large number of animal species we think are cute could be because of indiscriminate cuteness perception. "Cuteness promiscuity" might be a byproduct of our unusual life history, high altriciality, and high variance in infant appearance. This tendency to think that many different animals are cute could be even more pronounced in women, who are the primary caretakers of altricial infants. Given selection over time for dogs to elicit both fellow-feeling (kin selection) and the cuteness response, it makes sense that their suffering is much more prioritized than that of other species. Given women's special sensitivity to cuteness, it makes sense that we find such a large difference in men and women when it comes to animal morality.

### **Sex differences in morality towards animals**

In the example above in which a dolphin fostered a melon-headed whale, she also nursed him. Cross-species nursing is also common cross-culturally. Women around the world have nursed baby animals like bears, monkeys, pigs, and puppies (H. Herzog, 2019). In some of these cultures, eating an animal nursed at the breast is considered as taboo as eating your own child. In other cultures, animals are traded so they can be eaten by strangers, and in some cultures, animals are nursed so that they can be later eaten (Serpell, 1996). Among the Ainu of Japan, bear cubs are breast fed and then ceremonially sacrificed and eaten, while the women who suckled the bear cubs show their ambivalence by alternately crying and laughing (Serpell, 1996, p. 184).

Unsurprisingly, given women's sensitivity to cuteness and their greater nurturing response (on average), women show stronger moral concerns for animals than men do. For example, 45% of women would let a foreign tourist die before their cat or dog, compared to 30% of men (Topolski et al., 2013), and 33% of women would kill a person to save 1,000 dogs, compared with 23% of men (Petrinovich et al., 1993). However, men and women were similarly likely to say they would save a close relative over a pet (Topolski et al., 2013). There are many other sex differences in moral attitudes towards animals, reflecting differences in moral emotions such as disgust, empathy, and the cuteness response. Women are much more likely to be involved in animal protection and animal

advocacy, much more likely to be vegetarian, more likely to hoard animals, and much less likely to hunt or engage in direct animal abuse (H. Herzog, 2007). Women are less speciesist than men (Caviola et al., 2018). Women are more likely than men to believe that animals experience complex emotions like grief and anxiety (Walker et al., 2014). There are also substantial sex differences in moral views on animals. In a 2015 poll, 42% of women compared to 22% of men said that animals deserve the same rights as people (Riffkin, 2015). In a 2011 Gallup poll on moral issues, the largest sex differences were on issues related to animals: “Majorities of men, but less than half of women, consider the use of animal fur for clothing, and medical testing on animals to be morally acceptable” (Saad, 2010). Women are also much more opposed to “unnatural” technologies, including food additives, genetically modified foods, and animal testing (Funk et al., 2015). In particular, 62% of women oppose the use of animals in scientific research, versus 40% of men.

### **Animal Testing: Disgust and Empathy**

The widespread opposition to animal testing is a good demonstration of how disgust and empathy can create strong feelings around animal ethics, even when they conflict with important human interests such as biomedical advances. All drugs and interventions to prevent human and animal suffering must first be tested. Gary Francione (2009), who famously advocates abolishing the use and ownership of animals, has called animal testing one of the only uses of animals that isn’t frivolous. Animal testing is one of the highest profile and most controversial uses of animals, although it accounts for a very small proportion of animal suffering. “We kill 200 food animals for every animal used in a scientific experiment” (Herzog, 2010, p. 176). More than half (52%) of Americans oppose the use of animals in scientific testing (Strauss, 2018), and 60% oppose animal cloning (Masci, 2017) – a technology that could lead to significant advances in biomedical research and comparable gains in human welfare. In comparison to other animal-related causes, there have been much larger changes in legislation and regulation around animal testing. For instance, the European Union has implemented bans on cosmetic animal testing (“Testing cosmetics on animals,” 2019) (Arguably, this was only possible because most cosmetic ingredients have already been tested on animals for decades and found safe).

In 2015, 0.2% of animals were killed in labs but a disproportionate 0.7% of charity money went to this cause (Bockman, 2016). Some of the only true terrorism by animal advocates -- some death threats and property damage -- has targeted scientists and laboratories conducting animal research. In particular, scientists who work with primates or dogs have been targeted (H. Herzog, 2010). Familiarity is one heuristic we use to infer that something isn’t dangerous or pathogenic. Unlike meat eating, animal experimentation’s visceral associations and unfamiliarity combine to

create an impression of “unnaturalness” (Holden & Herzog, 2019) that is disgusting and stimulates moral condemnation.

## **Meat**

Meat is a strongly preferred food among humans. This enjoyment of and desire for meat is a major contributor to our moral attitudes about meat, and to our self-deception about the living conditions of animals raised for meat. Humans almost certainly evolved eating meat (Wrangham, 2009), and seem motivated to eat meat specifically. For instance, human taste buds appear to be sensitive to a flavor abundant in cooked meat called umami (Lindemann et al., 2002). In many places in the world there is a special word for “meat hunger” (Fiddes, 2004; Zaraska, 2016), as distinct from other kinds of hunger. In recent years the developing world, either imitating rich industrialized nations or actualizing their evolved taste preferences for savory, high-calorie foods, are eating more meat and other animal products (Kearney, 2010). Meat eating has increased a great deal in the US in the last few decades, and Americans now are eating an average of 125 kg of meat per year (Zaraska, 2016). And in China, the most populous country in the world, the average person in the 1970s ate 14kg of meat per year, whereas in 2010 they were eating 55kg of meat per year (H. Herzog, 2010). Everywhere in the world, people are eating more meat, year after year.

However, the strong human desire for meat has a flip side, because meat has often been a dangerous food to eat, more likely to contain pathogens than plant foods. Because humans eat both plants and animals, they face an omnivore’s dilemma: there are a large number of foods that could be eaten, but they differ both in nutritional quality and in the risk of dangerous pathogens. Disgust is thought to have evolved to reduce the chance of coming into contact with potential pathogens, especially those that are orally incorporated (Tybur et al., 2012). That’s likely why culture discourages eating certain animal foods. Taboos are more often leveraged against meat than against other foods (Fessler & Navarrete, 2003). The trait of “disgust sensitivity” is positively linked to meat avoidance (Fessler et al., 2003), and disgust is often given as an explicit reason for not eating meat (Santos & Booth, 1996).

As I argued earlier, there is evidence that most animals used for food are sentient, and that human imposition of industrial-scale suffering on sentient animals may, from the perspective of aggregate suffering, be one of the most pressing concerns of our generation (Singer, 1990). The scale of animal use is staggering. According to an interview with expert Lewis Bollard (2017), there currently are 23 billion chickens being farmed (15 billion for meat and 8 billion for eggs), 6 billion mammals (like cows, pigs, and rabbits), and over 100 billion farmed fish. Even if we ascribe to each of these animals just a fraction of the sentience and moral concern ascribed to a human, this adds up to a massive moral issue – vastly more aggregate suffering than global poverty or disease among

humans. From the perspective of sentient suffering, the environmental and sustainability issues around meat also matter. Meat is environmentally costly to produce, requiring more water and land per calorie, in addition to being one of the major producers of greenhouse gases and water pollution (Steinfeld et al., 2006). Meat feeds fewer people with the same resources. Estimates of inefficiency vary, but the same amount of grain produces 10 times fewer calories through grain-fed cattle than when eaten directly (Bittman, 2008). (However, it's important to consider that much of the land that isn't suitable for farming can still feed grazing ruminants, like cattle, and thus can produce food).

In principle, boycotting animal products could significantly reduce many of these problems. But, even in places with abundant food choices, vegetarianism and veganism are rare (Pinker, 2011). Most self-described "vegetarians" eat meat (Cooney, 2014), and perhaps 90% of people who self-identify as vegetarian aren't vegetarian (H. Herzog, 2010 p. 195). Moreover, lapsed vegetarians outnumber current vegetarians (H. Herzog, 2011), and many vegetarians avoid red meat for health reasons rather than ethical reasons. Thus, it's difficult to estimate how many people are boycotting animal products for ethical reasons.

All foods cause some degree of suffering -- even vegetables and fruit, because many small wild animals, from insects to birds, are killed during planting and harvesting. As Norwood and Lusk (2011) glibly comment, "even veganism is murder" (2011, p. 229). However, animal foods differ markedly in how much suffering they cause. Ironically, the most popular ways that vegetarians and semi-vegetarians reduce their consumption of animal products may impose more net suffering than a diet centered around beef would, as I discuss below.

Disgust is a major driver of meat avoidance (Fessler et al., 2003). Red meat, which retains more cues of its animal origins, like blood, is considered much more disgusting than fish or chicken, which are often packaged to hide their animal origin (H. Herzog 2010, p. 190). Health messages about meat underscore this disgust, with recommendations to cut out red meat and to eat chicken, eggs, and fish instead. Self-described vegetarians, who are often motivated by both disgust and health messaging, often end up eating more chicken than self-described meat eaters do (H. Herzog, 2010, p. 195). Another factor beyond disgust is that we often feel more empathy for cows and pigs than for fish and chickens, because they have more humanlike and neotenous characteristics.

How might consumption of fish, eggs, and chicken, to the exclusion of beef and pork, cause more animal suffering? There are two main reasons: animal size and quality of life. Chickens and farmed fish are smaller animals, which means that for each animal bred, caged, and slaughtered, we get far fewer meals. This observation was the basis of a tongue-in-cheek campaign from PETA called "Eat the whales" (Tomasula, 2001). In a 100-ton blue whale, there are 70,000 chickens worth of meat. (H. Herzog, 2010, p. 193). Considering living conditions, chickens (both egg-laying hens and

broiler chickens) and farmed fish have much worse lives than conventionally produced beef cattle (Tomasik, 2018a). Conventionally produced beef cattle spend much of their lives in pasture and the last 100-200 days of their lives in a feedlot –they can eat, stretch out, and associate with others of their species. By contrast, broiler chickens live in cramped conditions and often have crippling leg problems. Egg-laying hens kept in cages usually have their beaks removed so they don't cannibalize one another in cramped spaces. Often this causes chronic pain or inability to feed, and it doesn't solve the problem of hens' aggressing against their cage mates. Conventional pork production is widely considered to be terrible for smart social animals such as pigs, who are confined and bored, like a dog kept in a kennel cage for months on end. For those concerned with humane animal treatment, a reasonable goal is that animals raised for food should only have "one bad day": the day they go to slaughter (for detailed descriptions of how different animals are raised for food see Norwood & Lusk, 2011 and Singer & Mason, 2006).

Remarkably few people have tried to compare animal welfare across species or to calculate how much suffering is caused by eating different animal foods. Still, there is some consensus on which animals have the best and worst lives. Economists Bailey Norwood and Jayson Lusk (2011) came to similar conclusions as Tomasik (2018) in terms of the quality of life of various animals raised for food (and also quantified the quality of life for animals kept for breeding purposes) (2011, p. 229). They estimated that laying hens and veal calves have the worst quality of life, and that beef cattle and dairy cows have the best quality of life relatively speaking. (However, Norwood and Lusk argue that broiler chickens have a much better quality of life on average than most animal advocates think they do.).

How does all this add up? We can quantify a "suffering footprint": an estimate of how many days of suffering animals endure to contribute a unit of meat to our diet. Table 1 is adapted and simplified based on Tomasik's (2018a) calculation of how many days of suffering per kg are caused by the demand from buying various animal foods. I have simplified the calculation here by assuming that all animals are sentient, and by assuming that each animal has roughly the same suffering on the day of slaughter (the reader can input values in the table at the Reducing Suffering blog, <https://reducing-suffering.org/how-much-direct-suffering-is-caused-by-various-animal-foods/>). Here, animal lifespan is how many days the animal lives before slaughter, on average; kg of food per animal lifespan is how much edible food weight is produced by the animal; suffering per day of life is how bad the animal's life is based on best estimates from animal welfare researchers (note that beef cattle have the best lives and battery hens have the worst lives). The column on the right indicates for each kg of the animal product consumed how many days of suffering there are adjusted for the badness of each day of life.

Animal product	Animal lifespan (days)	Kilos of food per animal lifespan	Suffering per day of life (beef cows =1)	Adjusted days of suffering caused per kg demanded
Farmed catfish	820	.39	1.5	3200
Farmed salmon	639	2.0	1.5	480
Battery cage eggs	501	16	4	130
Chicken	42	1.9	3	68
Turkey	133	9.6	3	42
Pork	183	65	2.5	7.1
Beef	395	212	1	1.9
Milk	1825	30000	2	.12

Using a similar calculation, the standard American with a typical diet of animal products causes 5 years, 6 months, and 5 days of animal suffering per year (Hurford, 2014). Regardless of specific numbers, many “vegetarians”, most of whom still eat fish, eggs, and chicken, are causing more days of animal suffering, and more intense suffering, than many meat eaters are. Based on the calculations from the table above, a vegetarian who eats three eggs at a meal (around 150 grams) is causing 19.5 days of chicken suffering, compared to a meat eater who eats a 1.3 kg steak that causes around 2.4 days of cow suffering. The average vegetarian almost certainly causes less suffering than the five years of suffering created through the average American diet. But the perception that the average self-described “vegetarian” (who tends to eat fish and chicken) is more moral than the average meat-eater is derived not from any quantitative analysis of animal suffering, but from their claimed concern for animals, and from the fact that they eat less meat from mammals, who are cuter and more humanlike. Even a vegetarian who eats eggs every day would cause more suffering than someone on an all-beef diet. An actual vegan, who eats no animal products including meat, fish, eggs and dairy causes the least amount of suffering with their consumption. Giving up fish, eggs, and chicken would reduce animal suffering about 90% as much as a vegan who eats no animal

products at all (Cooney, 2014). Unfortunately, there is no name for this avoiding fish, eggs, and chicken ethical stance, and thus it is not possible to signal this or reap any benefits to social moral reputation.

The impact of better welfare animal practices on animal suffering and human morality is beyond the scope of this chapter. But it seems that people are much more likely to think they are buying humane animal products than they really are (Reese, 2017). Given that billions of animals are farmed for food across thousands of facilities, and the food industry remains politically powerful, it's difficult to enforce humane standards. The little evidence we have, such as that undercover animal advocacy operations seem to always discover cruel mishandling and mistreatment of animals, even on farms with "humane standards", doesn't bode well.

### **Clean meat**

"Fifty years hence, we shall escape the absurdity of growing a whole chicken in order to eat the breast or wing by growing these parts separately under a suitable medium," – Winston Churchill (1932 p 26).

It's unlikely that individual consumer choices are going to significantly reduce the demand for animal products. Polls show Americans say they are very concerned about animal welfare, but this doesn't translate into their choices as consumers. One experiment on the "vote/buy gap" – the tendency for consumers to vote for higher welfare standards but not to buy in accordance with these ideals – showed that 80% of consumers who chose to buy cookies made with battery cage eggs said that battery cage eggs should be illegal (Paul et al., 2019). The vast majority of people in Western societies would state that they are morally repulsed by slavery, and yet when a report documented that around 1/3 of shrimp produced in Thailand involved slave labor (Hodal & Lawrence, 2014), this did not change the huge demand for shrimp, and there is still slavery in the supply chain now (Clark, 2019). From a historical perspective, no movement has ever made significant gains from endorsing individual boycotts of large-scale industries. An analysis of the abolitionist movement against human slavery showed that boycotting slave-produced goods was not effective, and was not that widespread, even among abolitionists (Witwicki, 2017).

One possible solution to the problem of animal suffering caused by meat production is *in vitro* meat, cultured meat, or "clean meat". Clean meat is the "cultivation of food grade animal tissues in carefully controlled environments" (McLaren, 2014, p. 1). Clean meat holds the promise of replacing slaughter-based meat production. The fast rate of technological innovation in clean meat seems to have overcome some of the obstacles I wrote about several years ago (Fleischman, 2013). The main obstacle has been price preventing clean meat from meeting market demand. Creating a structure for *in vitro* meat to grow, to keep it at the correct temperature and inundated with

nutrients for cell division, and free from contamination, made it prohibitively expensive. The debut clean meat burger in London created by Mark Post a few years ago cost about \$330,000 to make (McLaren, 2014). But, after many failed predictions (Madrigal, 2013), it seems clean meat might soon be coming to market. A few major obstacles seem to have been overcome since clean meat is now being taste-tested for the public.

However, our evolved psychology may still present obstacles to the uptake of clean meat. Food preferences crystallize at an early age (Birch, 1999) and people feel disgust about foods that are unfamiliar to them. To increase demand for clean meat, ethical vegetarians might at least be willing to try it. However, in two small surveys it was found that the majority of vegans and vegetarians (71%) were unwilling to try *in vitro* meat (Fleischman, 2012). A larger survey of vegetarians found a similar result, with 73% unwilling to eat it (Dahlgreen, 2013). In my survey (Fleischman, 2012), it seemed that the stipulation that *in vitro* meat would cause no more animal suffering than plant foods did not change attitudes against *in vitro* meat, leaving disgust as the most probable cause. Indeed, 32% of vegans explicitly cited disgust as a reason they would not want to try it. There is some research indicating that moral vegetarians are more disgust-sensitive overall (Rozin et al., 1997). However, it is disappointing that this group is likely not going to be leading the way towards clean meat.

Vegan and vegetarian attitudes are probably not that important for the future of clean meat. The most important thing is uptake from people eating the most meat and populous countries whose meat consumption is increasing, namely China and India. There is some hopeful news as familiarity with clean meat increases. In one survey of American adults, the majority were willing to try clean meat (65%) and about one-third said they would be willing to eat clean meat as a replacement for farmed meat (Wilks & Phillips, 2017). Men, who tend to eat more meat than women, also had a more positive view of clean meat in this American sample. In a sample of over 3,000 participants from the USA, India, and China, 93% of Chinese participants said they were likely to purchase clean meat, as were 86% of Indian participants and 75% of American participants (Bryant et al., 2019). In keeping with ideas about sex differences and food aversions, men and those who are less disgust-sensitive are more favorable towards clean meat (Bryant & Barnett, 2018).

If clean meat is going to become an important solution to the myriad problems of the global animal industry we have to learn from history, both evolutionary and cultural. As I mentioned above, we as humans are more concerned about meat contamination than other food sources. Any warning about clean meat contamination, or a recall, could have pervasive long-term effects and mean that people will continue to buy more familiar meat from animals that suffered and died for decades to come. Branding clean meat as “clean meat” rather than *in vitro* meat, lab meat, cultured meat, or

synthetic meat was an important first step in combatting disgust sensitivity. One major reason that genetically modified food wasn't an unalloyed success was because of perceptions of unnaturalness (Mohorčich, 2018), another form of disgust response that can be reduced by increasing consumer familiarity. Framing is also important; meat producers learned long ago that mentioning the animals themselves reduced consumer acceptance (Zaraska, 2016). We don't really want to know how the sausage is made, and less detail about how clean meat is produced generally improves attitudes (Bryant & Barnett, 2018). We as humans are more concerned with what's delicious than what is virtuous, consumers rarely care enough to buy or boycott any product because of its moral ramifications (Bryant & Barnett, 2018). That's why making sure that clean meat is tastier than conventional meat can go a long way. Finally, the rise of zoonotic diseases like coronavirus and H1N1 can hopefully turn the tide of disgust sensitivity in the other direction, against forms of animal agriculture that can cause pandemics.

### **Virtue signaling and animal welfare**

“Stop smirking. One of the most universal pieces of advice from across cultures and eras is that we are all hypocrites, and in our condemnation of others' hypocrisy we only compound our own.” — Jonathan Haidt (2006, p. 60)

Most animals are incapable of communicating about their suffering and cannot leverage reputational concern (Sperber & Baumard, 2012). However, because people can advertise their moral attitudes in so many ways now, from vegan bumper stickers to social media posts, there is more widespread concern about the suffering of animals than at any previous point in history. Our moral attitudes do not occur in a vacuum. Advertising our moral qualities to others for social benefits, whether these moral qualities are instantiated in behavior or just “cheap talk”, is known as virtue signaling (Miller, 2019). When definitions of moral behavior shift in social groups, culture can change moral behavior to the extent that it's available for virtue signaling. This is one reason that animal advocates have had so much more success with institutional change over individual changes (Reese, 2018). People are willing to advertise moral ideals by signing a petition or publicly advocating that a business change its harmful animal practices, but are unwilling to engage in more costly and less visible individual boycott.

Our moral identity is important to us, and there is a strong psychological motivation to present ourselves as more moral than others (Kurzban, 2011) and to resist others' claims of moral superiority. This creates fraught relationships with “moral minorities” who consider themselves to be in the moral vanguard – including animal advocates, vegans, and others who hold and display a virtuous identity. Vegetarians are widely disliked by the rest of society. In one study, participants reported disliking vegans and vegetarians more than atheists, asexuals, immigrants, or Blacks, but

reported being more willing to hire or rent to vegans and vegetarians than all other target groups (MacInnis & Hodson, 2017). In this study, only drug addicts were more disliked than vegans.

Because moral rules are considered to be universal, meeting someone who holds different or more strict moral standards than you do can be seen as an implicit indictment of your behavior. People tend to rate themselves as more moral and better than others; meat eaters rate vegetarians as more moral than the average person, but rate vegetarians as less moral than themselves (Minson & Monin, 2012). Maintaining a moral reputation is a major reason that meat eaters rate vegetarians negatively. They anticipate that vegetarians are judging them and will communicate their moral condemnation of meat-eaters to others. Meat eaters rated vegetarians more negatively when they were first asked to consider how much vegetarians might judge them, and meat eaters expected vegetarians to judge them three times more negatively than they were actually judged (Minson & Monin, 2012). Of course, it's possible that because being judgmental is widely considered immoral, vegetarians were reporting less judgement than they actually felt.

One interesting aspect of the Minson and Monin (2012) study was that some meat eaters were first given an opportunity to say what they thought about vegans before later reporting how much they agreed with their moral message. Participants in the study often described vegetarians as "weird", "preachy," and "sadistic". But afterward, they were more likely than other participants who did not derogate vegetarians to say that they agreed with the moral message of vegetarianism. This is interesting from an evolutionary reputation management perspective. Reducing someone else's reputational status relative to your own might increase your likelihood of taking their message seriously; you don't have to fight as hard to make yourself look good. Moral change often happens when we want to socially affiliate with others, and negative impressions of activists --from animal advocates to social justice advocates-- undermines the cause (Bashir et al., 2013). Importantly, for any moral advocate, they must remember that others are going to have strong incentives to derogate them and will scrutinize them for moral inconsistency (Monin, 2007). Anyone advocating a major change in moral priorities must remember that people have spent years honing their virtue signaling strategies, and will not take kindly to someone arguing that they have really been hugely less virtuous than they thought. The evolutionary psychological challenge for animal advocacy is to nudge people to show more concern for animal suffering, without feeling like their whole virtue-signaling identity has to be jettisoned and rebuilt from scratch.

## **Conclusion**

Evolutionary explanations are often maligned because they are said to excuse or normalize the perpetration of violence. To say that animal cruelty and inflicting animal suffering is normal and natural is not to minimize the suffering of animal victims either as the result of any individual's

sadism or the large-scale production of animal products. To say that we are kinder to animals that demonstrate kinship cues or that elicit the cuteness response is not to say that these responses are moral. To say that we are more disgusted by meat that looks more like the animal it came from than meat that looks more abstract is not to say it is more moral to eat meat packaged in cellophane. And to say that we virtue signal about our moral behavior is not to say that moral behavior isn't important or that cynical motivations render moral behavior immoral. When we take our moral intuitions as moral rules we project and institutionalize our evolved moral blind spots into the world, often making it worse for others. Advocacy requires understanding. If animal suffering is an ethical issue, we have to be realistic about our human responses and the incentives we respond to with ethical behavior.

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