



Methodological and Ideological Options

Animal Welfare and Social Decisions: Is It Time to Take Bentham Seriously?

Olof Johansson-Stenman¹

Department of Economics, School of Business, Economics and Law, University of Gothenburg, Box 640, SE, 405 30 Gothenburg, Sweden

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ABSTRACT

This paper analyzes and questions the standard welfare economics assumption of *anthropocentric welfarism*, i.e., that only human well-being counts intrinsically. Alternatives where also animal welfare matters intrinsically are analyzed both theoretically and empirically. The general public's ethical preferences are measured through a survey of a representative sample in Sweden, and the responses from a clear majority suggest that animal welfare should indeed carry intrinsic weight in public decision making. Current legislation in many countries is consistent with this. A brief review of moral philosophy on animal welfare indicates that a large majority of philosophers believe that animal welfare should count intrinsically. It is moreover demonstrated that it is theoretically and practically possible to generalize welfare economics in order to give intrinsic value also to animal welfare. The paper concludes that there are strong reasons to (sometimes) generalize welfare economics in order to take animal welfare into account directly, i.e., in addition to effects through individual utilities. The practical implications of doing so are likely to be more important over time as the scientific methods of measuring animal welfare are gradually improving.

“Animals are not self-conscious and are there merely as a means to an end. The end is man. [...] Our duties towards animals are merely indirect duties towards humanity.”

Immanuel Kant (1963 [1780])

“The French have already discovered that the blackness of the skin is no reason why a human being should be abandoned without redress to the caprice of a tormentor. It may come one day to be recognized, that the number of the legs, the villosity of the skin, or the termination of the *os sacrum*, are reasons equally insufficient for abandoning a sensitive being to the same fate. [...] The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?”

Jeremy Bentham (1996 [1789], Chapter 17, Footnote b)

1. Introduction

As suggested by Samuelson (1938), welfare evaluations in economics are typically based on revealed preference methodology, implicitly assuming that people choose what is in some sense best for themselves. However, Kahneman et al. (1997) argue in an influential

paper that since psychological research has identified large and systematic decision errors, normative economic theory should be based on the hedonic measure *experienced utility*, as in Bentham's usage, rather than *decision utility* as revealed by people's choices. Since the publishing of Kahneman et al.'s paper, a literature on paternalistic interventions has evolved, where people when analyzing appropriate regulations and laws are essentially protected from their own limited self-control and/or cognitive ability.²

The present paper suggests another, but related, potential reason to take Bentham seriously, namely the issue of whether we should devote intrinsic concern for animal suffering (or welfare more generally) in public decision making.³ Here too, revealed preference methodology is insufficient, mainly for two reasons: First, animal suffering is a non-market good (or bad). Hence, since there is no market, it is hard to reveal people's preferences for such issues. While some people are willing to pay an additional price for a good that is associated with less animal suffering, i.e., a price premium that is possible to estimate (see, e.g., Chilton et al., 2006; Chang et al., 2010; Norwood and Lusk, 2011a, 2011b; Vander Naald and Cameron, 2011), some people also seem to value animal well-being beyond what is associated with their own

E-mail address: Olof.Johansson@economics.gu.se.

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² See, e.g., Gruber and Köszegi (2001), Camerer et al. (2003), O'Donoghue and Rabin (2006), and Thaler and Sunstein (2008); yet see also Bernheim and Rangel (2007, 2009) and Sugden (2004, 2009) for choice- or opportunity-based approaches when people do not have coherent preferences.

³ Of course, biologically speaking also humans are animals. What is written here about animal welfare and animal suffering should thus be interpreted as *non-human* animal welfare and suffering.

consumption choices. For example, I may value that also the animals associated with your consumption choices are treated reasonably well, and vice versa. Second, people may choose, or prefer the government to choose, based on other ends than their own well-being. For example, in a governmental choice between policies A and B, where A implies greater well-being for all humans (taking into account indirect effects of animals' well-being on humans' well-being) and B implies greater well-being for animals, it is possible that some people would like the government to choose policy B.

Conventional welfare economics is based on what Sen (1970, 1979) denotes *welfarism*, i.e., that social welfare depends solely on utility or well-being, as well as *anthropocentrism*, meaning that it is only human utility or well-being that counts intrinsically. Both of these assumptions, and the latter in particular, are so commonly made that they are usually not even mentioned in the literature, including in advanced and extensive textbooks in microeconomic and environmental economics such as Mas-Colell et al. (1995) and Hanley et al. (1997). It is of course still possible that people are willing to pay for reduced animal suffering and for improved environmental quality (and for public goods in general) to the extent that their utility is affected by such changes. However, social welfare is then only affected *instrumentally* and not *intrinsically*. Although such an anthropocentric view dominates in welfare economics, it is thus rarely expressed clearly in plain English. Baxter (1974) is an exception:

Penguins are important because people enjoy seeing them walk about rocks; and furthermore, the well-being of people would be less impaired by halting use of DDT than by giving up penguins. In short, my observations about environmental problems will be people-oriented, as are my criteria. I have no interest in preserving penguins for their own sake.

(Baxter, 1974, p. 5)

This quote makes clear that Baxter holds purely anthropocentric values, yet it does of course not follow that most people would agree.

The fundamental question that the present paper asks, and tries to answer, is this: *Is there reason to relax the anthropocentric assumption in economics, and hence to allow for incorporating non-anthropocentric ethical assumptions?* This question is important for at least three reasons: (1) The size of the animal-based food sector is large, and the treatment of animals in that sector is important for food prices; it is consequently important to be able to analyze optimal regulations with respect to animal treatments in an adequate way. (2) An increasing number of people appear to be concerned about animal welfare and rights issues. (3) The motives behind current legislation are often expressed in clearly non-anthropocentric terms.

The remainder of this paper is organized as follows: Section 2 briefly discusses whether we can measure animal welfare at all, because if we cannot, it may not matter much whether we in principal think we should take such concerns into account. It is concluded that there are indeed scientifically established measures of animal welfare. Although such measuring is typically more difficult than measuring human welfare, it is certainly not impossible, and available measurement methods are likely to improve over time. Section 3 discusses whether we can model animal welfare in a social welfare function framework and demonstrates how such a framework can indeed be enriched with animal welfare concerns. More specifically, it shows how the crucial concept of Pareto efficiency as well as monetary welfare measures in terms of private and social willingness to pay are modified in a world where animal welfare is taken into account intrinsically, i.e., valued beyond human well-being. Section 4 discusses briefly how animal well-being has been handled in moral philosophy over time, as well as at present. It concludes that, although there is substantial heterogeneity, in most approaches at least some weight is given to animal welfare beyond indirect effects through human well-being. Section 5 concerns people's view on these matters and starts off by reflecting on current legislation as well as engagement in animal rights organizations. It then presents

the result of a Swedish survey, where a representative sample of Swedes were explicitly asked about the extent to which they believe animal suffering should count, per suffering unit, compared with the same amount of human suffering. It is found that a clear majority is of the opinion that animal welfare should indeed carry intrinsic weight in public decision making. Section 6 concludes that, in light of the findings here, it is problematic to maintain the view that welfare economics should always be based exclusively on the well-being of humans.

2. Can We Measure Animal Welfare?

Before proceeding, it is useful to reflect on the measurability of animal welfare. After all, if we cannot measure it in any reasonable way, it will not make much sense to include it in economic welfare analysis. When reflecting on this, it should immediately be obvious that it is not possible to measure animal welfare very accurately. Indeed, we can hardly conclude that it is possible to measure *human* welfare, including interpersonal comparisons, very accurately, and measuring *animal* welfare is of course even more difficult, e.g., since it is much harder to communicate with animals. Yet, this does not mean that it is impossible to measure animal welfare. In fact, there exist accepted measures based for example on physiology (e.g., immune function and hormonal status) and observed behavior; see, e.g., Dawkins (2006, 2008), Mellor (2009) and Mench (forthcoming) for overviews of issues related to scientific measurements of animal welfare. However, some insist that we, at a deeper and more fundamental level, cannot really know that animals experience pain. Singer's (1993, p. 69) response to such doubts is:

We can never directly experience the pain of another being, whether that being is human or not. When I see my daughter fall and scrape her knee, I know that she feels pain because of the way she behaves—she cries, she tells me her knee hurts, she rubs the sore spot, and so on. I know that I myself behave in a somewhat similar—if more inhibited—way when I feel pain, and so I accept that my daughter feels something like what I feel when I scrape my knee. The basis of my belief that animals can feel pain is similar...

Overall, hardly anyone in the scientific community denies that animals do feel pleasure and pain in the ways we normally think of these words. Moreover, animal welfare is now an established scientific discipline with established journals such as *Animal Welfare* and *Journal of Applied Animal Welfare Science*; see, e.g., Coelho et al. (2016) and Grist et al. (2017).

What about the comparison of the capacity to feel pleasure and pain among different species? Here most existing literature seems to suggest that “higher animals” are likely to suffer more from similar treatments than animals with less complex nervous systems. For example, it is reasonable to expect that killing an ant will cause much less suffering than killing a cow in a similar way. Yet, comparing the suffering capacity among more advanced animals is less straightforward. For example, Richard Dawkins has argued that our likely initial conjecture that there is a positive correlation between such a capacity and intellectual capacity may be wrong:

I can see a Darwinian reason why there might even be a *negative* correlation between intellect and susceptibility to pain. I approach this by asking what, in the Darwinian sense, pain is for. It is a warning not to repeat actions that tend to cause bodily harm. Don't stub your toe again, don't tease a snake or sit on a hornet, don't pick up embers however prettily they glow, be careful not to bite your tongue. [...] Isn't it plausible that a clever species such as our own might need *less* pain, precisely because we are capable of intelligently working out what is good for us, and what damaging events we should avoid? Isn't it plausible that an unintelligent species might need a massive wallop of pain, to drive home a lesson that we can learn with less powerful inducement? At very least, I

conclude that we have no general reason to think that non-human animals feel pain less acutely than we do, and we should in any case give them the benefit of the doubt. Practices such as branding cattle, castration without anaesthetic, and bullfighting should be treated as morally equivalent to doing the same thing to human beings.

(Dawkins, 2011)

Whether correct or not, for the present purpose it is sufficient to conclude that while it is clearly difficult to measure animal welfare, it is not impossible, and that the available methods for doing this are likely to improve over time.

3. Can We Systematically Model Animal Welfare Within the Framework of a Social Welfare Function?

Let us here focus on the so-called social welfare function (SWF) approach, according to which the objective function of a government (or society more generally) is to maximize an ordinal SWF. Thus, we restrict our focus to a consequentialist approach. While this may seem restrictive to many philosophers, it is a completely dominating approach in economics regardless of whether animal well-being or environmental matters are analyzed.⁴

Such an SWF can be defined over different domains. In economics, SWFs are almost always defined over individual (human) utilities, and nothing else. We will here demonstrate how conventional welfare analysis, where interpersonal utility-comparisons are not needed, can be generalized with cases where also animal well-being matters. [Eichner and Pethig \(2006\)](#) have already generalized welfare theory in this respect.⁵ They consider an integrated, dynamic model of the economy and the ecosystem with competition between human and nonhuman species for land and prey biomass, where the production side is thus modeled explicitly and over time, and where the well-being of also nonhuman species is assigned positive weight.

The aim of this section is in a sense more modest. We will focus solely on the utility side of the analysis and hence not model production explicitly, and we will moreover solely deal with a static model. The reason is that it is easier to carefully express how welfare analysis can be expanded in such a framework, or in any case to make the arguments more explicit and transparent so that the reader can more easily judge the strength of the arguments. Given that the arguments are accepted, it is not difficult to expand the analysis to a more complex setting and, e.g., allow for different explicit production settings, changes over time, available policy instruments, and informational assumptions. In [sub-section 3.1](#), we consider different normative propositions related to different SWFs and their properties. These normative propositions are subsequently linked with the views of various philosophers (in [Section 4](#)) and the general public (in [Section 5](#)). In [sub-section 3.2](#), we consider how the notion of Pareto efficiency, perhaps the most central concept of modern welfare theory, can be expanded by allowing for animal welfare. Finally, monetary welfare measures are defined in [subsections 3.3 and 3.4](#) in such a framework.

3.1. Models of Competing Normative Hypotheses

Consider a society consisting of n individuals whose well-being is represented by utility functions that depend on their own private consumption (or consumption of a composite good). The utility also

⁴ The notion “consequentialist approach” here does not indicate any particular type of utility information regarding measurability and comparability, which will be discussed further subsequently. Recent survey-based evidence derived from a Swedish sample ([Johansson-Stenman, 2012](#)) seems to indicate that the majority agrees that what should govern public decision makers are the consequences of the governmental measures rather than, say, whether these measures are in conflict with someone's rights or with religious rules. Yet, there are of course also non-consequentialist models in economics; see, e.g., [Howarth \(1995\)](#) for a deontological approach to the problem of sustainable development.

⁵ See also [Ng \(1995\)](#) for arguments in favor of a related idea, denoted *welfare biology*.

depends on animal welfare, which in turn depends on the environmental quality, and it will also depend directly on the environmental quality. For presentational reasons we will represent environmental quality by using a single measure, E , but it is straightforward to generalize this measure to a vector with any number of elements. Individuals may also derive utility from animal well-being and may therefore be affected negatively by animal suffering. Here too, we will for presentational reasons consider a single measure of animal welfare, given by A . We assume that A depends positively on E , which is a choice variable for the government. The utility function of an arbitrary individual k can then be written as

$$u_k(x_k, A(E), E) \quad \forall k, \quad (1)$$

where u_k is hence increasing in each argument. So far, nothing is assumed beyond the conventional model. For example, at this stage we assume nothing beyond ordinality of the utility function, nor that utilities are interpersonally comparable.

We are now ready to state our competing and mutually exclusive normative propositions and express them in terms of corresponding SWFs.

Normative Proposition 1. No weight should be given to animal suffering.

In a world where people do not derive any utility from animal well-being (or disutility from animal suffering), this approach is of course consistent with the conventional welfare economics approach, with an SWF defined solely in terms of individual utilities, i.e., an SWF such as

$$W = w[u_1(x_1, E), \dots, u_n(x_n, E)] = w[\mathbf{u}(x, E)], \quad (2)$$

where $\mathbf{u} = \{u_1, \dots, u_n\}$ is a vector of the individual utilities and x is a corresponding consumption vector and where w is ordinal. Yet, if people do derive utility from animal welfare, i.e., in accordance with [Eq. \(1\)](#), then [Normative Proposition 1](#) is clearly inconsistent with the following conventional SWF:

$$W = w[\mathbf{u}(x, A(E), E)]. \quad (3)$$

Instead, we need an SWF as follows:

$$W = w[\mathbf{u}(x, A(E), E), A(E)], \quad (4)$$

where w decreases in A (while still being ordinal). Thus, if some people derive utility from reduced animal suffering, then for the net effect of reduced animal suffering on social welfare to be zero, social welfare must depend negatively on animal well-being per se.

An alternative would be to take a paternalist approach, implying that the government should not respect all elements of the individual's utility function. For example, [Sen \(1979\)](#), [Harsanyi \(1982\)](#), and [Goodin \(1986\)](#) have argued that the government should not respect anti-social preferences. In the present case, it could then be argued that the government should simply disregard utility effects due to changes in animal welfare; see [Aronsson and Johansson-Stenman \(forthcoming\)](#) for a recent analysis of such an approach when it comes to valuing relative consumption. Yet, it is of course far from obvious *why* preferences for animal well-being should not count. Another motive behind a paternalist approach may be that utilities as revealed by choices may not always reflect individual welfare, e.g., due to mistakes. In such a case one could, following [Kahneman et al. \(1997\)](#) and [Kahneman and Thaler \(2006\)](#), argue that public decision making should be directed by experienced utility (reflecting individual welfare or well-being) rather than decision utility (reflecting choices).⁶

Overall, in either case it is difficult to argue that the government should not consider animal welfare consequences when people's utilities (at least if they reflect individual well-being) are affected by animal welfare, and it is presumably also difficult to argue for such a position in moral philosophical terms. Let us next consider the

⁶ For earlier arguments along similar lines, see, e.g., [Harsanyi \(1982, 1995\)](#) and [Broome \(1999\)](#).

conventional anthropocentric social welfare model:

Normative Proposition 2. No weight should be given to animal welfare per se, yet indirect utility effects, e.g., through the fact that some people suffer when animals suffer, should be taken into account.

This is then clearly consistent with a conventional SWF, as given by Eq. (3). Thus, all welfare consequences are taken into account here as long as they ultimately affect individual utility (whether utility is ordinal or cardinal and interpersonally comparable or not), but not otherwise. This is then fundamentally different from the following case:

Normative Proposition 3. Positive weight should be given to animal suffering per se, i.e., independently of instrumental effects on human well-being, yet the weight per suffering unit should be lower for animals than for humans.

This proposition implies an SWF such as Eq. (4), where $\frac{\partial w}{\partial A(E)} > 0$.⁷ Note that this proposition implies that both individual utility and animal welfare changes must be cardinally measurable as well as comparable (in contrast to function w , which can still be ordinal); the same applies also to *Normative Propositions 4 and 5* below. Cardinality and interpersonal comparability are of course demanding properties, yet are at the same time frequently made assumptions in many sub-fields of economics, including in the literature on optimal income taxation when the problem is to determine optimal tax progressivity or redistribution and in the literature on social discounting when the problem is to determine the socially optimal discount rate.

One may argue that the weight given to animal suffering should be lower, e.g., since animals are less conscious than human beings, even though this motive is often heavily criticized, e.g., by utilitarian philosophers such as Peter Singer as referred to earlier. Presumably, many individuals may intuitively think it is reasonable to give some weight to animals without being able to justify more systematically why there should be a difference compared with human welfare. As expressed by Ng (1983, p. 165):

Most people (myself included) are not prepared to sustain such sacrifices [associated with giving the same weight to animal welfare]. What justification can we provide to reject man-animal parity? I can think of a pure and simple one – self-interest. To those who object that this is hardly an acceptable justification, I have to agree.

An SWF such as Eq. (4) is consistent also with the following case, which is in line with animal-including utilitarianism as defended by, e.g., Singer:

Normative Proposition 4. Positive weight should be given to animal suffering per se, and the weight per suffering unit should be the same for animals as it is for humans.

Peter Singer and many other utilitarian philosophers argue that the weight should obviously be the same for all, and that it would be speciesism (a word with a clear negative connotation presumably constructed to make the parallels with racism and sexism salient) to favor human welfare over animal welfare. It should be emphasized that *Normative Proposition 4* does of course *not* imply that all consequences or treatments for animals and humans should be given equal weight, since humans may be expected to suffer much more than certain animals would from the same consequence or treatment. For example, if humans were to experience the same (or corresponding) forced feedings as ducks do, it is conceivable that humans would suffer more than the ducks (which of course still suffer badly from such treatments).

However, it is of course also possible to argue that greater weight should be given to animal suffering, in particular if it is caused by

human beings. Consider therefore the perhaps extreme position that prioritizes animal suffering:

Normative Proposition 5. Positive weight should be given to animal suffering per se, and the weight per suffering unit should be higher for animals than for humans.

Although this view could be seen as extreme, it could be motivated, e.g., by the fact that animals are to a greater degree non-responsible for their own suffering compared with human suffering. This can be compared to the fact that it is sometimes argued that risks that are inflicted on someone should be valued higher than voluntary risks. Indeed, evidence suggests that when choosing among life-saving programs, people prefer to reduce involuntary risks (Slovic et al., 1985; Mandeloff and Kaplan, 1989) and risks that are difficult to avoid (e.g., Subramanian and Cropper, 2000).

Although beyond the main task of this paper, let us for completeness also mention the possibility of non-welfaristic SWFs⁸ such that

$$W = w[\mathbf{u}(x, A(E), E), A(E), E]. \quad (5)$$

Thus, in this case the environment is considered valuable in itself, beyond instrumental effects for human beings and animals, sometimes denoted deep ecology following Næss (1973), biocentrism (e.g., Agar, 2001), or ecocentrism.

3.2. Pareto Efficiency Measures with Animal Welfare

Pareto efficiency is perhaps the most central concept in modern welfare economics. Let us here contrast two different definitions in a world with animal welfare.

Definition 1. A feasible allocation is animal-excluding Pareto efficient if there is no other feasible allocation such that the well-being of any human being increases without a decrease in well-being for any other human being.

This definition is the conventional one based on anthropocentric ethics (see, e.g., Mas-Colell et al., 1995), although the exclusion of animals is (almost) never mentioned explicitly.

Definition 2. A feasible allocation is animal-including Pareto efficient if there is no other feasible allocation such that the well-being of any human being or animal increases without a decrease in well-being for any other human being or animal.

The maximization of a conventional SWF associated with *Normative Proposition 2*, i.e., according to Eq. (3), subject to a resource constraint, implies an allocation that is animal-excluding Pareto efficient and generally not animal-including Pareto efficient. However, the maximization of an SWF where animal welfare is given an intrinsic value, such as in Eq. (4) associated with *Normative Propositions 3, 4 or 5*, subject to a resource constraint, implies an allocation that is animal-including Pareto efficient and generally not animal-excluding Pareto efficient.

It is well known that the condition for animal-excluding Pareto efficiency (i.e., what is typically simply referred to as *Pareto efficiency*) does not presuppose either cardinality or interpersonal utility comparability (e.g., Mas-Colell et al., 1995). Instead, all that is required is well-defined and consistent ordinal preferences. Yet, note that the same applies to the condition for animal-including Pareto efficiency as well. The only difference here is that the ordinal preferences of animals are included as well.

⁷ This terminology thus implies that society is a broad term that includes also animals, even if they carry less weight in priorities. Baum (2009) uses the term *society* in a similarly broad sense.

⁸ A *non-welfaristic SWF* may sound like an oxymoron. A reader who is not happy with this name may then prefer to change it to a *non-welfaristic social objective function*.

3.3. Monetary Animal Welfare Measures with a Representative Individual

Welfare measures in applied economics, including environmental economics, are usually based on measures of individuals' maximum willingness to pay (*WTP*), and, in the continuous case, on measures of marginal willingness to pay (*MWTP*), which reflects the marginal rate of substitution between the good to be valued and money, and as such they are independent of any monotonic transformation of the underlying utility function, implying that an ordinal approach is sufficient. Yet, the relationships between welfare changes and individual *WTP* measures are of course less straightforward when we also consider the welfare of animals. As is common in the literature on welfare measures and cost-benefit analysis, we abstract from distributional welfare issues.⁹ In the next subsection, we will instead consider the many individual cases with a more restrictive utility function.

Let us start with the SWF corresponding to *Normative Proposition 2*, such that $W = w[u(x, A(E), E)]$, implying that no intrinsic value is given to animal welfare per se whereas indirect human welfare effects caused by animal welfare changes are taken into account. Recalling that w is an ordinal function, any monotonic transformation of W , such as $u(x, A(E), E)$ – i.e., the utility function itself – is an equally valid SWF. The *MWTP* for an increase in E is then given by the slope of the indifference curve:

$$MWTP \equiv - \frac{dx}{dE} \Big|_u = \frac{\partial u / \partial E}{\partial u / \partial x} + \frac{\partial u / \partial A}{\partial u / \partial x} \frac{\partial A}{\partial E} = MRS_{Ex} + MRS_{Ax} \frac{\partial A}{\partial E}, \quad (6)$$

where the first term reflects the marginal rate of substitution (*MRS*) between the environment E and income x , i.e., the individual's valuation of a small change in E in terms of x holding animal welfare constant, and the second term reflects the *MRS* between animal welfare A and x , i.e., the individual's valuation of a small change in A in terms of x holding E constant, multiplied by how much A changes per unit of E .

It is also straightforward to implicitly determine the *WTP* (or compensating variation) associated with a discrete change in environmental quality from E to $E + \Delta E$ as follows:

$$u(x, A(E), E) = u(x - WTP, A(E + \Delta E), E + \Delta E). \quad (7)$$

Here *WTP* thus reflects the maximum amount that the individual is willing to pay for an improvement in the environmental quality from E to $E + \Delta E$, which includes the increase in animal welfare from $A(E)$ to $A(E + \Delta E)$. So far, we are within the framework of conventional welfare analysis based on ordinal utility theory.¹⁰

Consider next the case where animal well-being enters directly into the SWF, as in the remaining *Normative Propositions 3–5* (and also potentially *Normative Proposition 1*, depending on the interpretation) where $W = w[u(x, A(E), E), A(E)]$. Then the individual measures of *MWTP* and *WTP* for changes in E will still be given by Eqs. (6) and (7) (provided of course that the individual is a utility maximizer), and these measures are moreover still independent of any monotonic transformation of the utility function, implying that utility can be seen as ordinal. However, these measures will then not fully reflect the social

⁹ See Kaplow and Shavell (1994) and Kaplow (2000) for supporting arguments, based on the idea that it is often well motivated to deal with distributional issues through more targeted systems, such as the income tax system, rather than legal regulations. Yet, see Johansson-Stenman (2005) for caution that this is far from always the case. The model can of course be extended to deal also with distributional concerns, e.g., through utility functions that are concave in own consumption, but the main insights related to animal suffering remain the same.

¹⁰ Yet, although this is typically seen as the conventional approach, there is by now a huge literature on different kinds and degrees of utility measurability beyond the ordinal approach, and correspondingly on different degrees of comparability; see Adler and Fleurbaey (2016) for a recent and excellent overview and Adler (2016), Fleurbaey (2016), Graham (2016), and Weymark (2016) in particular. More generally, Amartya Sen (e.g. Sen, 1973, 1977, 1979, 1991) has repeatedly pointed out that economists use the concept of utility in several different ways, and argued that they should be more explicit about these different meanings and corresponding implications.

welfare changes associated with the underlying SWF. In contrast, let us introduce the notion *social* marginal willingness to pay (*SMWTP*), which reflects how much private income (in terms of consumption of the composite good) *society* is willing to forego for a small increase in E (per unit of E). In other words, *SMWTP* reflects the slope of the *social* indifference curve, and it is straightforward to show (see Appendix A) that it can be written as:

$$SMWTP = MWTP + \delta \frac{\partial A}{\partial E}, \quad (8)$$

where $\delta \equiv \frac{\partial w}{\partial A} / \left(\frac{\partial w}{\partial u} \frac{\partial u}{\partial x} \right)$. Thus, we can separate the *SMWTP* into two terms, where the first is the private *MWTP* (defined as before) and the second reflects the intrinsic value attached to animal welfare, since δ reflects the direct social value of a small increase in A per unit of consumption x . *Normative Proposition 1* then implies that $\delta < 0$ (if we do not rely on a paternalistic interpretation) such that $SMWTP < MWTP$, *Normative Proposition 2* implies that $\delta = 0$ such that $SMWTP = MWTP$, whereas *Normative Propositions 3–5* imply that $\delta > 0$ such that $SMWTP > MWTP$. Note that in contrast to the definition of *MWTP*, where we need nothing more than ordinal utility information, for the definition of *SMWTP* we need to be able to compare the contribution to social welfare from the utility change arising from a private consumption unit with the change in animal welfare arising from a change in E . Thus, we need both cardinality and comparability between utility changes and changes in animal welfare.

Similarly, we can implicitly define the discrete social willingness to pay (*SWTP*), which reflects how much private income *society* is willing to forego for a certain discrete increase in environmental quality from E to $E + \Delta E$:

$$w[u(x, A(E), E), A(E)] = w[u(x - SWTP, A(E + \Delta E), E + \Delta E), A(E + \Delta E)] \quad (9)$$

While we cannot additively separate *SWTP* into *WTP* and another term related to the intrinsic valuation of animal welfare (as we could for *SMWTP*), it will still be the case that the *SWTP* exceeds the *WTP* when animal welfare is valued intrinsically, i.e. that $SWTP > WTP$ when $\partial w / \partial A > 0$ (see Appendix A).

3.4. Monetary Welfare Measures with Many Individuals

In this subsection, we will consider social welfare changes based on many non-identical individuals. Yet, in order to still abstract from distributional concerns (typically done in cost-benefit analysis), we will make additional functional form assumptions of both the SWF and the individual utility functions. In particular, we will adopt an animal-welfare extended utilitarian SWF as well as utility functions that are linear in private income, and where the marginal utility of income is hence always the same for all individuals.

Consider the following functional form example where the SWF is additively separable in animal welfare and given by

$$W = \sum_i u_i(x_i, A(E), E) + \beta A(E), \quad (10)$$

where β reflects the relative weight given to animal welfare (on the margin) compared with an equally large amount of human welfare. Thus, the SWF is given by a utilitarian SWF in human well-being augmented with a term reflecting animal welfare. The individual utility function for an arbitrary individual k is also additively separable and given by¹¹

$$u_k = x_k f(A(E), E) + g_k(A(E), E). \quad (11)$$

Eq. (11) implies that the marginal utility of consumption is the same for all individuals such that a dollar has the same value for all

¹¹ Note that while the preferences differ through the functions g_k , the function linked with private income, f , is identical for all.

individuals, which is of course restrictive but often explicitly or implicitly assumed in cost-benefit analysis in order to avoid aggregation problems. Based on Eqs. (10) and (11), it is possible to derive expressions for the private and social *MWTPs* (see Appendix A), and in particular it is possible to again disentangle the *SMWTP* into private ones plus a term reflecting the intrinsic social value of animal welfare, as follows:

$$SMWTP = \sum_i MWTP_i + \beta \frac{\partial A / \partial E}{f(A(E), E)}. \quad (12)$$

Hence, we can observe that the social *MWTP*, which reflects how much society is willing to reduce private income per unit of *E*, equals the sum of the private *MWTPs* plus a term reflecting the intrinsic value of animal welfare in the *SWF*. The numerator of the ratio in the last term reflects the animal welfare change per unit of *E* and the denominator reflects the (social) marginal utility of private income.

Similarly, based on the same functional forms, we can express the private and social willingness to pay for a discrete change in environmental quality (see Appendix A), and also express the *SWTP* in terms of private *WTPs*, as follows:

$$SWTP = \sum_i WTP_i + \beta \frac{A(E + \Delta E) - A(E)}{f(A(E + \Delta E), E + \Delta E)}. \quad (13)$$

Thus, the overall social *WTP* for an increase in *E*, resulting in improved animal welfare, is here given by the sum of individual *WTPs*, based on both animal welfare and environmental improvements, and a term reflecting the intrinsic value of animal well-being. Note that $A(E + \Delta E) - A(E)$ reflects the discrete increase in animal welfare due to the change in *E*, whereas $f(A(E + \Delta E), E + \Delta E)$ reflects marginal utility of income (at environmental quality $E + \Delta E$). While this specific result of course hinges on the restrictions of the utility function and on the utilitarian augmented *SWF*, it is a natural benchmark result when distributional effects between individuals are not considered essential. Note also that for the case where marginal utility of income as well as the contribution of *E* per unit of *A* are approximately constant in the intervals considered, we may simplify Eq. (13) further, as follows:

$$SWTP \approx \sum_i WTP_i + \frac{\beta}{\mu} \frac{\partial A}{\partial E} \Delta E, \quad (14)$$

where μ is the (common for all) marginal utility of income. Hence, Eq. (14) shows that the social *WTP* for an improvement in *E* is given by the sum of individual *WTPs* plus a term consisting of the product of $\frac{\beta}{\mu}$, which reflects the relative weight given to animal suffering compared with human suffering in monetary terms, and the magnitude of the animal suffering given by $\frac{\partial A}{\partial E} \Delta E$.

In this section, we have shown that it is possible, and indeed relatively straightforward, to extend the conventional theory of welfare measurements to the case where animal welfare carries intrinsic weight in the *SWF*. Yet, and perhaps needless to say, this does not change the fact that it is anything but straightforward to quantify the relationships between animal welfare and underlying environmental variables and to compare these with measures of human well-being, which are tasks far beyond the scope of the present paper.

4. Do Moral Philosophers Believe We Should Value Animal Welfare Intrinsically?

Modern Western philosophy is largely influenced by its heritage of Judaism/Christianity and Greek antique philosophy. In Genesis 1:26 of the Bible, God says:

Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

In the Western humanistic/Christian tradition, animals have consequently for a long time been viewed as distinctly inferior to humans and have even been treated as objects rather than subjects from an ethical point of view. Yet, it is sometimes argued that Greek philosophy in general, and Aristotle in particular, has been even more influential in this tradition.¹² He writes in *Politics*:

Plants exist for the sake of animals, and brute beasts for the sake of man – domestic animals for his use and food, wild ones for food and other accessories of life, such as clothing and various tools. Since nature makes nothing purposeless or in vain, it is undeniably true that she has made all animals for the sake of man.

(Aristotle, 350 BC, Book 1, Chapter 8)

These ideas were then incorporated into Christianity partly through the writings of Thomas Aquinas, who was very influenced by Aristotle and wrote about animals that:

...by divine providence they are intended for man's use in the natural order. Hence it is no wrong for man to make use of them either by killing or in any other way whatever.

(Aquinas, 1905[1258–1264])

This view, by and large, dominated both law and general thinking for a very long time in Western societies. In the seventeenth century, Descartes pushed these ideas to an extreme when he referred to animals as “automata” unable to feel pain. Many followers of Descartes consequently believed that animal crying was just a reflex, similar to the kind of reaction one may get from a mechanical doll or some other type of machine. One logical implication was that they saw no reason not to experiment on animals without anesthetics.

It was not until the age of enlightenment that animals received serious attention, and as noted by the explicitly non-utilitarian philosopher Martha Nussbaum (2006), this change was largely due to the early utilitarian philosophers. For example, Jeremy Bentham, in the same section as his famous initial quotation of this paper, in *An Introduction to the Principles of Morals and Legislation*, argued that animals, too, should be protected by the law and that it is unsatisfactory that animals, “on account of their interests having been neglected by the insensibility of the ancient jurists, stand degraded into the class of things” (Bentham, 1789, Chapter 17, Section 4). There is evidence (see, e.g., Favre and Tsang, 1993) that his writings were influential in obtaining what is widely regarded as the world's first animal protection legislation, the so-called *Dick Martin's Act*, introduced in Britain in 1822 to prevent, or at least reduce, cruel treatment of cattle.¹³

John Stuart Mill had a similar opinion, and when forcefully defending Bentham in a debate, he made clear that the issue of animal welfare was not of peripheral concern to him:

We are perfectly willing to stake the whole question on this one issue. Granted that any practice causes more pain to animals than it gives pleasure to man; is that practice moral or immoral? And if, exactly in proportion as human beings raise their heads out of the slough of selfishness, they do not with one voice answer “immoral”, let the morality of the principle of utility be forever condemned.

(Mill, 1852)

¹² However, the ancient Greek world also contained much discussion and reflection about the moral status of animals; see, e.g., Sorabji (1993) for an extensive treatment. A well-known example is Socrates' hesitation concerning eating meat, according to Plato's (2006 [360BC]) *Republic*: “Would this habit of eating animals not require that we slaughter animals that we knew as individuals, and in whose eyes we could gaze and see ourselves reflected, only a few hours before our meal?”

¹³ Yet, there are of course many cultural sources of modern environmentalism, such as the Romantics (see, e.g., Perkins, 2003), arising around the time of the emergence of utilitarianism. Some even argue that the Romantics, including poets such as Wordsworth, Coleridge, and Shelley, may have been equally, or even more, influential than the philosophers for the development of modern environmentalism, including for the re-consideration of animals' moral status.

Perhaps of even more interest to economists are the reflections of public intervention in his *Principles of Political Economy*, where he explicitly points out the need for animals to be protected by law:

The reasons for legal intervention in favour of children, apply not less strongly to the case of those unfortunate slaves and victims of the most brutal part of mankind, the lower animals. It is by the grossest misunderstanding of the principles of liberty, that the infliction of exemplary punishment on ruffianism practised towards these defenceless creatures has been treated as a meddling by government with things beyond its province; an interference with domestic life. The domestic life of domestic tyrants is one of the things which it is the most imperative on the law to interfere with.

(Mill, 1848, Book 5, Chapter 11, Paragraph 31)

He continues in the same paragraph by explaining that his concerns are directed toward the animal suffering per se and not toward potential instrumental effects:

It is to be regretted that metaphysical scruples respecting the nature and source of the authority of government, should induce many warm supporters of laws against cruelty to animals, to seek for a justification of such laws in the incidental consequences of the indulgence of ferocious habits to the interests of human beings, rather than in the intrinsic merits of the case itself.

Henry Sidgwick, who besides Bentham and Mill is one of the most influential utilitarians, expressed strikingly similar opinions in his *Methods of Ethics*:

We have next to consider who the “all” are, whose happiness is to be taken into account. Are we to extend our concern to all the beings capable of pleasure and pain whose feelings are affected by our conduct? Or are we to confine our view to human happiness? The former view is the one adopted by Bentham and Mill, and (I believe) by the Utilitarian school generally: and is obviously most in accordance with the universality that is characteristic of their principle. It is the Good *Universal*, interpreted and defined as “happiness” or “pleasure,” at which a Utilitarian considers it his duty to aim: and it seems arbitrary and unreasonable to exclude from the end, as so conceived, any pleasure of any sentient being.

(Sidgwick, 1893 Book 4, Chapter 1, p. 414)

Many contemporary utilitarians hold similar views. Peter Singer (1974, 1975, 1993, 2005) is probably the best-known example:

If a being suffers, there can be no moral justification for refusing to take that suffering into consideration. No matter what the nature of the being, the principle of equality requires that its suffering be counted equally with the like suffering – in so far as rough comparisons can be made – of any other being. If a being is not capable of suffering, or of experiencing enjoyment or happiness, there is nothing to be taken into account.

(Singer, 1974)

In contrast, Immanuel Kant, perhaps the most influential rights or duty-based ethicist to date, argued (as quoted in the introduction of this paper) that animals are not part of the “categorical imperative” and have only instrumental values.¹⁴ The most well-known contemporary rights-based (in a broad sense) ethical contributions are presumably *A Theory of Justice* by John Rawls (1971) and *Anarchy, State and Utopia* by Robert Nozick (1974).¹⁵ Although these authors came to very different

conclusions regarding redistribution and the appropriate role of the state, arguing for extreme egalitarianism based on maxi-min principles and virtually no redistribution/a minimal “night watchman” state, respectively, their views on how to deal with animals are surprisingly similar. Neither one of them argues that animals should have the same rights as humans, yet both agree that animals should be given *some* weight (as long as they do not infringe on human rights), in what essentially seems to be a utilitarian trade-off between animal and human welfare. According to Rawls (1971, 512):

It does not follow that there are no requirements at all in regard to them [the animals], nor in our relations with the natural order. Certainly it is wrong to be cruel to animals and the destruction of a whole species can be a great evil. The capacity for feelings of pleasure and pain and for the forms of life of which animals are capable clearly imposes duties of compassion and humanity in their case.

Nozick (1974) is more explicit when discussing our habits of eating meat:

If some animals count for something, which animals count, how much do they count, and how can this be determined? Suppose (as I believe the evidence supports) that *eating* animals is not necessary for *health* and is not less expensive than alternate equally healthy diets available to people in the United States. The gain, then, from the eating of animals is pleasures of the palate, gustatory delights, varied tastes. I would not claim that these are not truly pleasant, delightful, and interesting. The question is: do they, or rather does the marginal addition in them gained by eating animals rather than only nonanimals, *outweigh* the moral weight to be given to animals' lives and pain? Given that animals are to count for *something*, is the *extra* gain obtained by eating them rather than nonanimal products greater than the moral cost?

Eventually, Nozick rejects utilitarian calculations also for the trade-off between animal and human well-being. However, the reason given is not that such trade-offs would give animal well-being too great a weight. Rather, he concludes that sometimes animal rights imply that an action probably ought not to be taken even if the increase in human well-being outweighs the loss in animal well-being.¹⁶ He exemplifies as follows (Nozick, 1974, p. 42):

Would it be alright to use genetic-engineering techniques to breed natural slaves, who would be contended with their lots? Natural animal slaves? Was that the domestication of animals? Even for animals, utilitarianism won't do as the whole story, but the thicket of questions daunts us.

Of the contemporary moral philosophers in the rights-based or deontological tradition, the late Tom Regan is the most well-known defender of explicit animal rights. He argued that higher animals in principle should have the same rights as human beings (e.g., Regan, 1983, 2001, 2003), a line of arguments largely continued by Gary Francione (e.g., Francione, 2000, 2008 and Francione and Garner, 2010).

Largely starting with Singer in the early 1970s, the philosophical literature related to animal welfare has virtually exploded; see, e.g., Sunstein and Nussbaum (2004), Nussbaum (2006), Dawkins (2008), and Lurz (2009) for much discussed contributions, and Beauchamp and Frey (2011) and Linzey and Linzey (2017) for handbook treatments.

¹⁴ However, soon thereafter, Johann Wolfgang Goethe extended the categorical imperative to also accommodate the interests of animals. In *Metamorphosis of Animals*, he argued that “each animal is an end in itself” (Goethe, 1790). The philosophy of Tom Regan, and many other contemporary philosophers who argue that animals have inherent rights, is also often characterized as Kantian in a sense that resembles this broader perspective.

¹⁵ Of which the rights in the philosophy of Rawls are induced through a contractarian

(footnote continued)

approach, whereas Nozick ultimately relies on a natural-rights approach.

¹⁶ It should be noted, however, that the implications of giving weight to animal well-being is of course not always straightforward. For example, as noted by Blackorby and Donaldson (1992) and Blackorby et al. (2005), in a version of what is often referred to as the *logic of the larder* argument, reduced meat consumption would also imply fewer living cattle in the world.

Although Singer and Regan are certainly not representative of philosophers as a group, a review of the literature reveals that most current philosophers of different traditions who have expressed any view on the matter tend to be of the opinion that animals should be given at least *some* intrinsic weight and that we have some responsibility toward them; cf. [Armstrong and Botzler \(2003\)](#). Thus, in terms of our hypotheses, most current philosophers appear to support either [Normative Proposition 3](#) or [4](#), whereas very few support [Normative Propositions 1](#) and [2](#). However, there are of course exceptions. For example, Peter Carruthers (1989, 1992) defends contractualist ethics and argues that animals have no intrinsic moral significance. It is somewhat paradoxical that economics, which from an ethical point of view almost entirely builds on consequentialism,¹⁷ is nevertheless built on assumptions that resemble Kant's (or Carruthers's) rather than Bentham's (or Singer's) perception with respect to animal suffering.

5. Do People in General Think We Should Value Animal Welfare Intrinsically?

In the previous section, we saw that moral philosophy does not provide much support for always relying on the conventional anthropocentric assumption. However, not everybody agrees that philosophical thinking and ethical arguments should influence public decision making. For example, law professor Richard Posner believes that animal suffering should only be given instrumental value and argues that an “ethical argument is and should be powerless against tenacious moral instincts” ([Posner, 2004](#), pp. 66–67).¹⁸ Even some philosophers, such as Bernard Williams (1985), question whether philosophical thinking should guide actual public priorities. Moreover, it is commonly argued, also by many philosophers,¹⁹ that social decisions in a democracy should somehow reflect the opinions of the citizens. In this section, we will therefore investigate whether laypersons tend to be more supportive than philosophers of anthropocentric welfarism.

5.1. Observed Behavior and Legislation

An increasing number of people are concerned about animal welfare and rights issues and many people are members of, and donate substantial amounts of money to, animal rights organizations such as People for the Ethical Treatment of Animals (PETA); indeed, this organization alone claims on its website to have more than two million members. It seems reasonable that most individuals who support such organizations adhere to their underlying values and, hence, believe that animal welfare should be valued intrinsically. However, most people are clearly not members of such organizations, and we cannot a priori rule out the possibility that most non-members believe that animal suffering should not be intrinsically valued at all.

Another way to indirectly observe people's behavior is to observe legislation, since democratically elected bodies decide upon laws in democratic societies, and hence these laws should somehow reflect the will of the people. We can here observe that the expressed motivations behind current legislation are in many countries (e.g., Sweden and the Netherlands) made in clearly non-anthropocentric terms, and the legislation of the European Union, as part of the Treaty of Amsterdam, since 1997 has emphasized the need to “ensure improved protection and respect for the welfare of animals as sentient beings.” However, although these laws were decided upon democratically, we are here talking about indirect democracy, and one cannot rule out that politicians sometimes pass laws against the will of the majority of its citizens.

¹⁷ In the sense that only consequences (and e.g. not intentions, rights or ethical obligations) ultimately carry weight in welfare evaluations. Philosophers sometimes use the word consequentialism in a more specific way.

¹⁸ See, however, also the response by [Singer \(2004\)](#).

¹⁹ See [Miller \(1999\)](#) for a moral philosophy explicitly made up of people's ethical preferences.

One may also speculate about the extent to which changes over time are driven through income effects; see [Frank \(2008\)](#) for an analysis of a possible “animal welfare Kuznets curve,” suggesting that the situation for animals may first get worse when income increases, and then beyond a certain income level get better.

In this perspective it is interesting to note that in a referendum on November 8, 2016 Massachusetts voters passed with a large majority a far-reaching law to protect farm animals from intensive confinement. This will eventually, it is said, prohibit farming methods that keep animals severely constrained for virtually their entire lives, including the use of veal crates for baby calves, gestation crates for mother pigs and battery cages for egg-laying hens. Moreover, the sale of meat and eggs produced using unaccepted methods will be prohibited, even when the products are from animals farmed outside the state. Yet, even though this evidence is more direct (and not filtered through the views of policy makers), we cannot rule out that many people voted to pass the legislation in order to avoid feeling bad from knowing about the animal suffering. Thus, it is still not perfectly clear (although it may seem likely) that the voters on average believe that the authorities should value the animal suffering per se, i.e., regardless of how bad people feel about the animal suffering as such.

Hence, there is reason to also try to find out more directly what people believe about the extent to which animal suffering should be taken into account in public decision making, an issue we turn to next.

5.2. Evidence from a Swedish Survey

The survey was conducted together with colleagues at the Department of Economics, University of Gothenburg, and mailed to 2450 randomly selected adults aged 18 or older in Sweden; the response rate was 45%. Due to missing responses to particular questions, the number of observations included in the analysis varies from 1032 to 1072, i.e., 42–44% of the total sample. The sample is fairly representative of adults in Sweden; the last column of [Table 2](#) provides mean values and standard deviations of the explanatory variables used. There is an overrepresentation of university-educated people and a slight overrepresentation of women. Of course there are possible biases, which will be further commented on in [sub-section 5.2.3](#).

5.2.1. The Main Survey Results

In order to test the anthropocentric assumption, the respondents were asked about how animal suffering, per suffering unit, should count compared with human suffering in public decision making. It is important to note that the comparison is thus *per suffering unit* and not in terms of a similar physical experience. For example, it is likely that two animals from different species will experience a very different amount of suffering from sharing a similar physical experience, such as breaking a leg. Moreover, it is implicit in this formulation that the number of individuals suffering will matter, too.²⁰

The results clearly show that the standard assumption in economics, i.e., that animal suffering should only count instrumentally, can be questioned since only 3.2% chose this alternative. Thus, in terms of our hypotheses, there is very little support for [Normative Propositions 1](#) and [2](#). The most frequently chosen alternative (49.3%) is instead the one where animal suffering and human suffering are counted as equal, which is in line with opinions expressed by utilitarians such as [Singer \(1974, 1975, 1993, 2004\)](#) and with our [Normative Proposition 4](#). Almost as many (13.2% + 30.3% = 43.5%) believe that animal suffering should count intrinsically yet not as much as human suffering, which corresponds to [Normative Proposition 3](#). Overall, the responses on

²⁰ For example, when animal suffering is taken into account to the same degree as human suffering, 10 cows experiencing one suffering unit each should, taken together, be considered more important than 8 human beings experiencing one suffering unit each. Yet it is of course impossible to know exactly how each respondent interpreted the question.

average imply that animal suffering should count less than human suffering, although the results provide very little support for *Normative Proposition 2*, i.e., for what is typically assumed in the economics literature in general and the environmental valuation literature in particular. In order to look into the determinants of the variation in ethical preferences, regression analysis is used, which is what we turn to next (Table 1).

Table 1

Response distribution for the following question: *Society can reduce animal as well as human suffering through various, usually costly, measures. To be able to prioritize, we need to know how great a weight society should place on reducing suffering in an animal (such as a cow) compared with reducing an equal amount of suffering in a human. Which of the following statements is most in accordance with your opinion regarding the weight that should be given to animal suffering in public decisions?*

| | |
|---|-------|
| Animal suffering should not count at all in public decisions | 0.8% |
| Animal suffering should not count per se. However, some people suffer when knowing that animals suffer, and this should be taken into account in public decisions | 3.2% |
| Animal suffering should be taken into account to a certain extent in public decisions, even when no human beings suffer when knowing that animals suffer. However, animal suffering should be given much less weight than human suffering | 13.2% |
| Animal suffering should be taken into account to a fairly high degree in public decisions, even when no human beings suffer when knowing that animals suffer. However, animal suffering should be given somewhat less weight than human suffering | 30.3% |
| Animal suffering should be taken into account to a degree equal to human suffering in public decisions, even when no humans suffer when knowing that animals suffer | 49.3% |
| Animal suffering should be taken into account to a very high degree in public decisions, even when no human beings suffer when knowing that animals suffer. Animal suffering should be given more weight than human suffering | 3.2% |

Note: Number of observations = 1072.

5.2.2. Econometric Analysis

Since the main variable under investigation, i.e., the degree to which animal suffering should be taken into account in public decision making, is an ordinal categorical variable, an ordered probit approach is a natural choice. Yet, simple OLS regressions are increasingly used for this type of data due to the more straightforward parameter interpretations and since it is often found that the two approaches give very similar results in terms of parameter significance and relative parameter magnitudes (i.e., where one parameter is compared with other parameters in the same regression); see in particular Ferrer-i-Carbonell and Frijters (2004). Therefore, the results of both an ordered probit regression and an OLS regression are presented, and as can be observed they are very similar in terms of parameter significance. Yet, since both ordered probit and (in particular) OLS regressions rely on strong assumptions, we also present the results from three different probit regressions in order to shed more light on the underlying variations in ethical preferences.

As shown in Table 2, on average women care more than men about animal suffering; the parameter of 0.37 in the OLS regression implies that women answer on average 0.37 steps closer to a higher value for animal suffering compared with men, which is clearly not only highly significant (in a statistical sense) but also substantial. This result can be compared with both Eckel and Grossman (1998), who present evidence from dictator games that women tend to behave more altruistically than men, and Andreoni and Vesterlund (2001), who found that “men are more likely to be either perfectly selfish, or perfectly selfless, whereas women tend to be more ‘equalitarians’ who prefer to share evenly” (p. 293). While the former suggests that our finding may simply reflect that women are more altruistic (in this case toward animals), the latter hints that the equal-weight formulation may have triggered, on average, stronger reactions from women than from men. When consulting the probit regressions, we can observe that the latter explanation appears not to be the sole one. The first probit regression reveals that women are less likely (2.6 percentage points) to choose the alternative where animal suffering is not given any intrinsic weight, and the second one reveals that they are 23 percentage points more likely to choose the alternative where animal suffering is given equal (or more) weight.²¹ The third probit regression reveals that women are 20 percentage points more likely to choose any of the extreme alternatives, which is

²¹ That the effect is much larger in the second probit regression is logical since more than 10 times as many chose the alternatives where animal suffering is given equal (or more) weight compared with the alternatives.

largely driven by the fact that they are more likely to choose the alternative where animal suffering is given equal (or more) weight.

We also see that concern for animal suffering increases with age and that it is lower if the respondent has children, is a Christian believer, or is university educated. The age-dependency may seem surprising, given that support for vegetarianism and the animal-rights movement appears to be particularly strong among younger people. On the other hand,

older people have had more experience of agricultural production that may be seen as more humane and less industrial, which may result in them expressing a stronger negative attitude to current agricultural production practices. This effect may have been amplified by the fact that a cow was explicitly mentioned in the question. Moreover, List (2004) provides experimental evidence that pro-social behavior may increase with age.

The child effect is perhaps due to a changed focus, where most things other than their own children decrease in relative importance. The negative Christianity effect is not surprising given the historical development described above, although it is not directly obvious since contemporary Christian theology emphasizes both that humans are superior to animals and that animals are part of God's creation and should therefore be treated well.

The negative effect of university education may seem more surprising. One possible explanation is simply that university education increases the probability of using cognitively more demanding strategies when choosing. For example, “no weight” and “equal weight” (the most frequently chosen alternative) are examples of choices that can be made without complex trade-offs, whereas “somewhat lower weight” and “much lower weight” more explicitly call for trade-offs to be made. Thus, it is possible that university-educated people chose “somewhat lower weight” instead of “equal weight” more often, not because of different ethical values but because they to a larger extent were willing to think in terms of trade-offs. The results from the probit regressions provide some support for this explanation, since university-educated respondents are less likely to choose extreme alternatives in both ends of the distribution, as revealed by the three probit regressions.²² Somewhat similarly, while those who live in a big city (by Swedish standards) on average have roughly the same opinion about the extent to which animal suffering should matter as those who do not live in a big city or in the countryside, they are significantly less likely to choose an extreme alternative. Finally, there are no significant effects of income or political preferences, corrected for other variables, on the extent to which a person thinks that animal suffering should matter in public decision making.

²² The reader may note that the education parameter for the no-intrinsic-weight probit regression is not significant at conventional levels (although it is close to significant at the 10% level). However, this does not mean that the education effect is small. On the contrary, recalling that only 4% chose not to give any intrinsic weight to animal suffering, a parameter value reflecting that university-educated respondents are almost two percentage points less likely to choose this alternative is quite substantial.

Table 2
Regression analyses on the weight that should be given to animal suffering, per suffering unit, relative to human suffering.

| Regression type | OLS regression | Ordered probit regression | Probit regression, marginal effects | Probit regression, marginal effects | Probit regression, marginal effects | Mean value [std] of the explanatory variables |
|--|---|---|---|--|---|---|
| Dependent variable | Relative weight given to animal suffering | Relative weight given to animal suffering | 1 if animal suffering should not count per se or not count at all | 1 if animal suffering should be taken into account to the same or a higher degree than human suffering | 1 if any of the conditions in the previous two probit regressions are fulfilled | |
| Constant | 3.05 (25.40) ^{***} | 2.16 (14.26) ^{***} | -0.080 (-3.16) ^{***} | -0.13 (-1.81) [*] | -0.029 (-0.42) | |
| Woman | 0.37 (6.72) ^{***} | 0.46 (6.58) ^{***} | -0.026 (-2.26) ^{**} | 0.23 (7.20) ^{***} | 0.20 (6.23) ^{***} | 0.54 [0.50] |
| Age (in 10 years) | 0.064 (3.17) ^{***} | 0.083 (3.32) ^{***} | -0.0041 (-1.10) | 0.038 (3.21) ^{***} | 0.032 (2.72) ^{***} | 4.61 [1.51] |
| Has any children | -0.15 (-2.33) ^{**} | -0.18 (-2.34) ^{**} | 0.0045 (0.37) | -0.058 (-1.57) | -0.53 (-1.45) | 0.37 [0.48] |
| Christian believer | -0.19 (-2.61) ^{***} | -0.24 (-2.64) ^{***} | 0.0052 (0.34) | -0.11 (2.46) ^{**} | -0.097 (-2.24) ^{**} | 0.17 [0.38] |
| University educated | -0.14 (-2.27) ^{**} | -0.19 (-2.62) ^{**} | -0.018 (-1.62) | -0.12 (-3.65) ^{***} | -0.14 (-4.30) ^{***} | 0.42 [0.50] |
| Lives in any of the three largest cities in Sweden | -0.0561 (-0.87) | -0.10 (-1.20) | -0.0015 (-0.12) | -0.081 (-1.98) ^{**} | -0.084 (-2.06) ^{**} | 0.25 [0.44] |
| Lives in the countryside | 0.016 (0.25) | -0.004 (0.05) | -0.016 (-1.46) | 0.003 (0.086) | -0.014 (-0.38) | 0.33 [0.47] |
| Equivalent household income per capita (in 10,000 SEK/month) | -0.032 (-1.17) | -0.040 (-1.12) | -0.0065 (-0.83) | -0.023 (-1.34) | -0.026 (-1.58) | 1.38 [1.17] |
| Would vote for the large right-wing party (the Moderates) | -0.094 (-1.24) | -0.11 (-1.14) | 0.014 (0.83) | -0.056 (-1.23) | -0.038 (-0.86) | 0.16 [0.37] |
| Cut-off values | | | | | | |
| α_1 | | 0.64 | | | | |
| α_2 | | 1.50 | | | | |
| α_3 | | 2.45 | | | | |
| α_4 | | 4.47 | | | | |

Note: Number of observations = 1032; marginal effects for the probit regressions are calculated at sample means.

*** Statistically different from zero at the 1% significance level.

** Statistically different from zero at the 5% significance level.

* Statistically different from zero at the 10% significance level.

5.2.3. Should We Trust the Survey Results?

In contrast to many other social scientists, economists are generally reluctant to use survey evidence (Bertrand and Mullainathan, 2001). However, some issues that we are intrinsically interested in are difficult to analyze empirically with revealed preference methods, and the interest in using surveys has recently increased in many sub-fields of economics. Even so, it is important to reflect on possible biases.

As mentioned, a potential problem with survey results is that people may want to self-signal that they are “better” and hence end up responding more in accordance with their ethical views than with how they would act in reality. However, this is less of a problem in our case since we are not primarily concerned with how people would or do act in reality. For example, it is evident that many of us appear to care quite little about animal suffering in our daily life, and if animal suffering were that important to us, one may wonder why most people (including the author) continue to eat meat. But although our ethics presumably do influence our actions, they are certainly not the only determinant.

Consider charity as an example: even if we believe that it is morally good to give a major share of our income to charity, most of us only give a small share. From this observation, we can of course not conclude that most people consider large charity donations to be morally blameworthy, or that most people are against publicly funded foreign aid. Similarly, one cannot conclude that a person who buys caged chicken would be against a law forbidding such chicken treatments. This is for at least two reasons, where free-riding is perhaps the most obvious one. That is, people may be willing to accept a certain price increase for all chickens to have better living conditions, but they may not care enough about them to be willing to accept the same price increase for the very minimal improvement in living conditions for chickens that *their own* changed chicken consumption would result in. Conditional cooperation provides another explanation. Indeed, a considerable amount of experimental research shows that people are often found *not* to free-ride in situations where conventional theory would predict them to if they observe or expect that others cooperate, too.²³ If instead others free-ride, they want to free-ride as well. Yet, while none of these explanations are due to hypothetical bias, it cannot be precluded that such biases may still exist for other reasons, or that there may be other biases.

Another possible bias is related to the many non-responses (as is almost always the case with surveys). Although the sample is reasonably representative of the general adult population in Sweden with respect to measurable characteristics, it is possible that there are non-negligible differences with respect to the ethical views of the respondents.²⁴ Still, it is hard to believe that the response pattern would be dramatically different without such a bias. Another potential bias is that respondents may want to express certain opinions about which we do not explicitly ask, such as, “I believe that animals should be treated better than they currently are.” By doing so, they may overstate the degree to which they really believe that animal suffering should be likened to human suffering; cf. Kahneman et al. (1999). One problem with this argument, however, is that only 3.2% chose the extreme alternative that animal suffering should be given higher weight than human suffering. Indeed, if many respondents acted strategically with this goal in mind, one would have expected a considerably higher fraction. There are also potential cognitive problems and associated

biases since many (perhaps most) respondents had presumably not thought much about these kinds of questions. It is therefore possible that some respondents adopted simplified, less cognitively demanding choice strategies. It is also possible that this made them more vulnerable to framing effects, i.e., to the details of how the choice questions were presented. Indeed, since such effects have been shown to be important quite generally (Tversky and Kahneman, 1981, 1986), future research on values related to animal welfare that tests the importance of different framings is encouraged.

6. Discussion and Conclusions

This paper has discussed whether there are reasons to relax the anthropocentric assumption in economics, in particular when dealing with normative issues such as legislation and regulation. As far as the author knows, this is the first study in economics that directly attempts to measure people's ethical preferences with respect to the weight that animal welfare should have in public decision-making.²⁵ Although there are good reasons to suspect that the survey-based estimates in this paper are not very accurate, they clearly indicate that the conventional anthropocentric assumption sometimes appears problematic, at least as long as one believes that the social decision rules should be based on people's ethical preferences. Of course, we cannot rule out geographical differences, and it is possible that the Swedish population is generally more concerned than many others about animal welfare.²⁶ Future research that uses other methods and samples is encouraged in order to test the robustness and generalizability of the empirical results presented here.

It was also demonstrated how, in principle, one can extend conventional welfare economics in order to encompass intrinsic valuations of animal welfare. This may have implications not only for applications of welfare economics in terms of pricing issues or cost-benefit analyses, but also for broader issues of institutional arrangements. Yet, that does not mean that it is in practice straightforward to extend welfare analysis to take animal welfare into account. For example, Eichner and Pethig (2006) note that people's willingness to pay for environmental improvements, as revealed, e.g., by a stated-preference method, may to some extent encompass individual's intrinsic valuation of animal welfare (as argued, e.g., by Johansson-Stenman, 1998). If this is the case, they argue that “the chasm between anthropocentrism and non-anthropocentrism appears to be reduced, from a pragmatic point of view, at least” (p. 66). Yet, the extent of such reduction will naturally depend on many issues, including details of the valuation method. More generally, the reason for analyzing animal welfare explicitly will not disappear.

Moreover, little support for the narrow anthropocentric assumption was obtained based on current legislation and the moral philosophical review. The latter also indicates a dramatic change in the perception of animal welfare over time. Parallel to this philosophical development, we have also witnessed an increased interest in animal rights issues among laypersons, and a large number of people are voluntarily donating money to animal rights organizations such as PETA. This change in attitude has also affected legislation, where the motivations behind current legislation are sometimes explicitly made in non-anthropocentric terms.

Thus, it seems that Bentham was right in presupposing a development toward greater concerns for animals, although we are certainly far

²³ Evidence from lab experiments is provided by, e.g., Fischbacher et al. (2001) and Fischbacher and Gächter (2010), whereas, e.g., Frey and Meier (2004) and Alpizar et al. (2008) provide field experimental evidence.

²⁴ In order to ensure full anonymity, we did not identify the responses. After about two weeks, a reminder was sent out to all households, i.e., to both those who had responded and those who had not, together with an explanation (i.e., the need for anonymity) as to why we sent reminders to everyone. Of course, the flip side of this strategy is that it makes non-response analysis essentially impossible. One could, for example, argue that people who respond to voluntary household surveys are particularly socially responsible, and that such people also tend to have ethical preferences that put high intrinsic weight on animal suffering and the environment.

²⁵ In contrast, as noted in the introduction, there are several studies that try to quantify people's willingness to pay for lower animal suffering in various contexts using different methods; see, e.g., Chilton et al. (2006), Chang et al. (2010), Norwood and Lusk (2011a, 2011b), and Vander Naald and Cameron (2011).

²⁶ On the other hand, it is clear that in some non-Western countries such as India, animals are often treated with much greater respect. For example, as reported by Nussbaum (2006), the High Court of Kerala in India not long ago applied Article 21 of the Indian constitution, which protects the right to live with dignity, on circus elephants.

from a situation where animal suffering is given the same weight as human suffering. One can speculate about the likelihood of this ever happening, but that is beyond the scope of this paper.

It is also interesting to compare the change over time in attitudes to animal welfare with more recent developments within economics, where we in the last decades have experienced a remarkable relaxation of the narrow *Homo economicus* behavioral assumptions along several dimensions. For example, time-inconsistent preferences (e.g., Gabaix and Laibson, 2006), social comparisons (e.g., Oswald, 1997; Johansson-Stenman et al., 2002; Luttmer, 2005), and various types of non-selfish behavior (e.g., Fehr and Gächter, 2000; Falk et al., 2005; Benabou and Tirole, 2006; Brekke and Nyborg, 2010) are now becoming part of mainstream economics. Moreover, the normative counterparts to this empirical literature have started to change accordingly. For example, paternalistic policies such as smoking restrictions and fat taxes, aimed primarily at correcting people’s decision errors, are now analyzed seriously within the core of economics (e.g., Gruber and Köszegi, 2001; O’Donoghue and Rabin, 2006), as are optimal public policy responses to the (still under-appreciated) fact that people tend to also value relative

(and not only absolute) consumption (e.g., Aronsson and Johansson-Stenman, 2008, 2010, 2015, forthcoming).

However, so far there has been less discussion about possible generalizations regarding the appropriate ethical assumptions underlying welfare economics. The present paper calls into question the assumption of anthropocentrism and concludes that welfare economic models and evaluations should at times be generalized in order to encompass the idea that animal well-being should sometimes matter intrinsically. The practical implications of doing so are likely to be more important over time as the scientific methods of measuring animal welfare are gradually improving. Allowing people’s ethical preferences to depend intrinsically on animal suffering will also prove useful from a positive point of view, e.g., in order to explain people’s political opinions and voting behavior.

Finally, the fact that many issues related to animal welfare are difficult to measure is not in itself a valid argument for neglecting such issues. As rhetorically asked by Amartya Sen (1987, 34) in a different but related context: “Why must we reject being vaguely right in favour of being precisely wrong?”

Appendix A

Derivation of Eq. (8)

By differentiating the SWF with respect to E and x , respectively, we obtain

$$SMWTP \equiv - \frac{dx}{dE} \Big|_w = \frac{\frac{\partial u}{\partial E} + \frac{\partial u}{\partial A} \frac{\partial A}{\partial E}}{\frac{\partial u}{\partial x}} + \frac{\frac{\partial w}{\partial A} \frac{\partial A}{\partial E}}{\frac{\partial w}{\partial x} \frac{\partial u}{\partial x}} \tag{A1}$$

Substituting Eq. (7) into Eq. (A1), together with the definition of δ , immediately imply Eq. (8).

Proof that SWTP Exceeds the WTP When Animal Welfare is Valued Intrinsically

Suppose it does not, and that instead $SWTP = WTP$. Then it follows from Eq. (7) that

$$\begin{aligned} &u(x, A(E), E), A(E) \\ &= u(x - WTP, A(E + \Delta E), E + \Delta E) \\ &= u(x - SWTP, A(E + \Delta E), E + \Delta E) \end{aligned}$$

Let us denote this utility level by u' . Substituting into Eq. (9) then implies

$$w[u', A(E)] = w[u', A(E + \Delta E)].$$

Yet, since by assumption $\partial w/\partial A > 0$ this cannot hold. Let us next consider the possibility that $SWTP < WTP$. Let as before use the short notation

$$\begin{aligned} &u(x, A(E), E), A(E) \\ &= u(x - WTP, A(E + \Delta E), E + \Delta E) = u' \end{aligned}$$

and let moreover

$$u(x - SWTP, A(E + \Delta E), E + \Delta E) = u'.$$

Substituting these short notations into Eq. (9) then implies

$$w[u', A(E)] = w[u', A(E + \Delta E)]$$

where due to monotonicity in x we have $u' < u''$. However, this can clearly not hold together with $\partial w/\partial A > 0$. Thus, we have by contradiction showed that $\partial w/\partial A > 0$ implies that $SWTP > WTP$.

Derivation of MWTP, SMWTP, and Eq. (12) in the Many Individuals Case

Based on Eqs. (6) and (11), we can express the private MWTP for individuals as follows:

$$MWTP_k = \frac{x_k \left(\frac{\partial f}{\partial A} \frac{\partial A}{\partial E} + \frac{\partial f}{\partial E} \right) + \frac{\partial g_k}{\partial A} \frac{\partial A}{\partial E} + \frac{\partial g_k}{\partial E}}{f(A(E), E)} \tag{A2}$$

Substituting next Eq. (11) into Eq. (10) implies

$$\begin{aligned} W &= \sum_i x_i f(A(E), E) + g_i(A(E), E) + \beta A(E) \\ &= X f(A(E), E) + \beta A(E) + \sum_i g_i(A(E), E), \end{aligned} \tag{A3}$$

where $X = \sum_i x_i$ is aggregate income. Since social welfare only depends on aggregate private income X and E , such that we may write $W = w(X, E)$, we can from Eq. (A3), through differentiations with respect to E and X , obtain the social marginal willingness to pay as follows:

$$\begin{aligned} SMWTP &\equiv -\frac{dX}{dE} \Big|_w \\ &= \sum_i \frac{x_i (\partial f / \partial A \quad \partial A / \partial E + \partial f / \partial E) + \partial g_i / \partial A \quad \partial A / \partial E + \partial g_i / \partial E}{f(A(E), E)} \\ &\quad + \beta \frac{\partial A / \partial E}{f(A(E), E)}. \end{aligned} \tag{A4}$$

Substituting Eq. (A2) into Eq. (A4) implies Eq. (12).

Derivation of WTP, SWTP, and Eq. (13) in the Many Individuals Case

By using Eqs. (7) and (11), we obtain:

$$WTP_k = x_k \left(1 - \frac{f(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \right) + \frac{g_k(A(E + \Delta E), E + \Delta E) - g_k(A(E), E)}{f(A(E + \Delta E), E + \Delta E)}. \tag{A5}$$

Similarly, using Eq. (9) and the SWF given by Eq. (10), it follows that:

$$\begin{aligned} SWTP &= X \left(1 - \frac{f(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \right) \\ &\quad + \frac{\sum_i g_i(A(E + \Delta E), E + \Delta E) - \sum_i g_i(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \\ &\quad + \beta \frac{A(E + \Delta E) - A(E)}{f(A(E + \Delta E), E + \Delta E)}. \end{aligned} \tag{A6}$$

Substituting Eq. (A5) into Eq. (A6) and collecting terms imply Eq. (13).

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