



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

WORKING PAPERS IN ECONOMICS

No 485

Animal Welfare and Social Decisions

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January 2011

ISSN 1403-2473 (print)
ISSN 1403-2465 (online)

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Abstract This paper analyzes the standard welfare economics assumption of *anthropocentric welfarism*, i.e., that only human well-being counts intrinsically. Alternatives where animal welfare matters intrinsically are explored theoretically, based on moral philosophical literature, and empirically where the general public's ethical preferences are measured through a survey with a representative sample in Sweden. It is concluded that welfare economics should be generalized in order to encompass the idea that animal welfare should sometimes matter intrinsically.

Keywords: animal welfare, anthropocentrism, welfarism, ethics, ethical preferences, cost-benefit analysis

JEL: D6, D7, Q5

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“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. What else is it that should trace the insuperable line? Is it the faculty of reason, or, perhaps, the faculty of discourse? But a full-grown horse or dog is beyond comparison a more rational, as well as a more conversable animal, than an infant of a day, or a week, or even a month, old. But suppose the case were otherwise, what would it avail? 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

Since Samuelson (1938), welfare evaluations in economics have generally been based on revealed preference methodology, implicitly assuming that people choose what is best for themselves. However, Kahneman, Wakker, and Sarin (1997) argue in their paper “Back to Bentham: Explorations of Experienced Utility” that psychological research has identified large and systematic decision errors, and that 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 paper by Kahneman et al., 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.¹

The present paper suggests another, but related, potential reason to return to Bentham,

¹ See, e.g., Gruber and Köszegi (2002), 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.

namely the issue of whether we should devote intrinsic concern for animal suffering (or welfare more generally) in public decision making. Here too, revealed preference methodology is of little help, mainly for two reasons: (1) 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. (2) People may choose, or prefer the government to choose, based on other ends than their own well-being.

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 most often not even mentioned in the literature, including advanced and extensive textbooks in microeconomic and environmental economics such as Mas-Colell, Whinston, and Greene (1995) and Hanley, Shogren, and White (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. For example, the suffering of a particular animal species may affect social welfare through altruistic concern in the utility function of one or many individuals. 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 1974:5)

This quotation 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?*

The focus is particularly on normative perspectives of this question, when e.g. analyzing appropriate regulations and laws, but it is relevant also for purely descriptive issues such as understanding the behavior of people. In trying to answer this basic question, we rely on two sources: moral philosophy and the general public's ethical preferences.² The reason for consulting moral philosophy may appear obvious, since a major purpose of this discipline is to systematically analyze ethical issues and assumptions. Yet, 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 values and argues that "ethical argument is and should be powerless against tenacious moral instincts" (Posner, 2004, 66-67).³ Even some philosophers, such as Bernard Williams (1985), question whether philosophical thinking should guide actual public priorities. Our second source, based on the general public's ethical preferences, is investigated since it is often argued that social decisions should reflect the opinions of the citizens. Our two sources are of course not independent of each other, and most philosophers presumably believe that people's ethical preferences have at least some normative significance for public decision making; for example, see Miller (1999) for a moral philosophy explicitly made up of people's ethical preferences.

Section 2 outlines a simple model where different ethical preferences are formalized and competing normative propositions are expressed. Section 3 relates these different ethical assumptions to monetary welfare measures, in terms of private and social willingness to pay

² The notion "ethical preferences" is unfortunately used with slightly different meanings in economics. Here the term reflects the opinions people have regarding the principles that should underpin social decisions.

for an animal welfare improvement. Section 4 briefly reviews the moral philosophical discussion on animal suffering. Perhaps not surprisingly, a large heterogeneity of views is found, yet the narrow anthropocentric perspective is found to be rare. The ethical preferences of laypersons with respect to animal suffering are analyzed in Section 5, which provides evidence from a representative survey in Sweden where the respondents were explicitly asked about their ethical perceptions. Little support was found for the conventional hypothesis that a reduction of animal suffering has no intrinsic value beyond the instrumental values (e.g., because some human beings suffer when animals suffer). 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. COMPETING MODELS AND NORMATIVE PROPOSITIONS

Consider a society in which we have s environmental dimensions, with the corresponding cardinally measured environmental qualities given by the vector $E \equiv E_1, \dots, E_s$, and m animals, with the corresponding cardinal animal well-being measures given by the vector $A(E) \equiv A_1(E_1, \dots, E_s), \dots, A_m(E_1, \dots, E_s)$, where $\partial A_j / \partial E_k > 0$ for all j, k , and where animal well-being is comparable among animals as well as between animals and human beings. Thus, the unit of analysis when considering animal well-being is each individual animal. We can think of the environmental dimensions in very broad terms. One dimension may be the ambient concentration level of ozone in a specific area, another may be the conditions at a certain slaughterhouse, and a third the (negative of the) extent to which force-feeding of ducks takes place. Assume also that we have n human individuals, with utility functions that depend on their own income (or consumption of a composite good) x as well as on the well-

³ See, however, the response by Singer (2004).

being of the animals and environmental qualities. Since we are concerned with welfare analysis, to the extent that experienced utility and decision utility differ (Kahneman, Wakker, and Sarin 1997; Kahneman and Thaler 2006), we are intrinsically concerned with experienced utility.⁴

The cardinal and interpersonally comparable 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 $\frac{\partial u_i}{\partial x_i} > 0$ for all i ; $\frac{\partial u_i}{\partial A_j} \geq 0$ for all i, j , and $\frac{\partial u_i}{\partial A_j} > 0$ for at least one i, j ; and where

$\frac{\partial u_i}{\partial E_k} \geq 0$ for all i, j and $\frac{\partial u_i}{\partial E_k} > 0$ for at least one i, k . An allocation can then be defined solely

as a function of each individual's income, x , and the environmental qualities. Let us further assume that society is guided by the consequentialist ethics of maximizing an ordinal social welfare function (SWF). So far, nothing is assumed beyond the conventional model. We are now ready to state our competing and mutually exclusive ethics hypotheses and express them in terms of corresponding SWFs.

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

People derive utility from reducing animal suffering, which implies that for the net effect to be zero, social welfare must depend negatively on animal well-being *per se*. This is consistent with an SWF that depends on a vector of individual utilities $u(x, A(E), E) \equiv u_1(x_1, A(E), E), \dots, u_n(x_n, A(E), E)$ as well as animal well-being such that

$$W = w[u(x, A(E), E), A(E)], \quad [2]$$

⁴ For earlier arguments along similar lines, see, e.g., Harsanyi (1982, 1995) and Broome (1999).

where $\frac{\partial w}{\partial u_i} > 0$ for all i . Differentiating [2] with respect to E_k implies that

$$\frac{dW}{dE_k} = \sum_{i=1}^n \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial E_k} + \sum_{i=1}^n \sum_{j=1}^s \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial A_j} \frac{\partial A_j}{\partial E_k} + \sum_{j=1}^s \frac{\partial w}{\partial A_j} \frac{\partial A_j}{\partial E_k} \quad \forall k. \quad [3]$$

For the net effect of animal suffering on social welfare to be zero, it then follows that

$\frac{\partial w}{\partial A_j} < 0$ for all j .⁵ Thus, in order to obtain *Normative Proposition 1*, the government needs to

put a *negative* intrinsic weight on animal well-being. Expressed in this way, it is clear that this approach is inconsistent with conventional welfare theory, and presumably also difficult to argue for in moral philosophical terms. Let us now instead consider the conventional anthropocentric social welfare model:

Normative Proposition 2. *No weight should be given to animal suffering per se, yet the fact that some people suffer when animals suffer should be taken into account.*

This is consistent with an SWF as follows:

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

Then a marginal welfare effect of an increase in an environmental quality can be written as

$$\frac{dW}{dE_t} = \sum_{i=1}^n \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial E_t} + \sum_{i=1}^n \sum_{j=1}^s \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial A_j} \frac{\partial A_j}{\partial E_t} \quad \forall t. \quad [5]$$

Thus, here all welfare consequences are taken into account as long as they ultimately affect human well-being.

⁵ If the net welfare effect of animal suffering should be zero, we must have that $\frac{dW}{dE_k} = \sum_{i=1}^n \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial E_k}$ for all k .

Combining that with [3], it follows that $\frac{\partial w}{\partial A_j} = -\sum_{i=1}^n \frac{\partial w}{\partial u_i} \frac{\partial u_i}{\partial A_j}$. Since by assumption $\partial w/\partial u_i > 0$ for all i ,

Normative Proposition 3. *A 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 each animal than for each human being.*

This proposition implies an SWF such as [2], but where now $\frac{\partial w}{\partial A_j} \geq 0$ for all j .⁶ Moreover, the marginal social welfare of increased environmental quality is given by [3], where

$Max \left\{ \frac{\partial w}{\partial A_1}, \dots, \frac{\partial w}{\partial A_s} \right\} < Min \left\{ \frac{\partial w}{\partial u_1}, \dots, \frac{\partial w}{\partial u_n} \right\}$. In the special case where the weight given to each

human individual is the same, we have that

$$\frac{dW}{dE_t} = \sum_{i=1}^n \frac{\partial u_i}{\partial E_t} + \sum_{i=1}^n \sum_{j=1}^s \frac{\partial u_i}{\partial A_j} \frac{\partial A_j}{\partial E_t} + \sum_{j=1}^s \alpha_j \frac{\partial A_j}{\partial E_t} \quad \forall t, \quad [6]$$

where $\alpha^j < 1$ for all j .

Normative Proposition 4. *A positive weight should be given to animal suffering per se, and the weight per suffering unit should be the same for each animal as it is for each human being.*

This proposition is consistent with a classical utilitarian animal-including SWF, as defended by, e.g., Peter Singer, as follows:

$$W = \sum_i^n u_i(x_i, A(E), E) + \sum_j^m A_j(E), \quad [7]$$

implying that

$\frac{\partial u_i}{\partial A_j} \geq 0$ for all i, j , and $\frac{\partial u_i}{\partial A_j} > 0$ for at least one i, j , it follows that $\frac{\partial w}{\partial A_j} < 0$ for all j .

⁶ This terminology thus implies that society is a broad term that includes also animals, even if they carry less

$$\frac{dW}{dE_t} = \sum_{i=1}^n \frac{\partial u_i}{\partial E_t} + \sum_{i=1}^n \sum_{j=1}^s \frac{\partial u_i}{\partial A_j} \frac{\partial A_j}{\partial E_t} + \sum_{j=1}^s \frac{\partial A_j}{\partial E_t} \quad \forall t. \quad [8]$$

It should be emphasized that *Normative Proposition 4* does of course *not* imply that all *consequences* or treatments for animals and human beings 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) kind of forced feedings as ducks do, it is conceivable that humans would suffer much more than the ducks. Consider now the perhaps extreme position that prioritizes animal suffering:

Normative Proposition 5. *A positive weight should be given to animal suffering per se, and the weight should be higher for each animal than for each human being.*

This implies that [2] holds, but now $\min \left\{ \frac{\partial w}{\partial A_1}, \dots, \frac{\partial w}{\partial A_s} \right\} > \max \left\{ \frac{\partial w}{\partial u_1}, \dots, \frac{\partial w}{\partial u_n} \right\}$. In the special case where the weight given to each human being is the same, we have then that [6] holds where $\alpha^j > 1$ for all j . Obviously, *Normative Proposition 5* is very strong.

Although beyond the main task of this paper, let us for completeness also mention the possibility of non-welfaristic SWFs⁷ such that

$$W = w[u, x, A(E), E, A(E), E], \quad [9]$$

where $\frac{\partial w}{\partial E_k} \geq 0$ for all k . Thus, in this case the environment is considered valuable in itself,

beyond instrumental effects for human beings and animals.

weight in priorities; Baum (2009) uses the term *society* in a similarly broad sense.

⁷ 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. ANIMAL WELFARE, PARETO EFFICIENCY, AND WILLINGNESS TO PAY

In this section, we will analyze some implications of giving intrinsic weight to animal welfare for the interpretation of the central concept of Pareto efficiency as well as for the specification of monetary welfare measures. In both cases, we will introduce new concepts in order to explicitly encompass intrinsic valuation of animal welfare.

3.1 Pareto Efficiency

Consider the feasible allocations $X \equiv x_1, \dots, x_n, E_1, \dots, E_s$ and $X' \equiv x'_1, \dots, x'_n, E'_1, \dots, E'_s$, and let us define two different kinds of Pareto efficiency:

Definition 1: A feasible allocation X is *animal-excluding Pareto efficient* (AEP) if there is no other feasible allocation X' such that $u_i(X') \geq u_i(X)$ for all $i = 1, \dots, n$ and $u_i(X') > u_i(X)$ for some i .

Thus, this definition is the conventional one based on anthropocentric ethics; cf., e.g., Mas-Colell, Whinston, and Greene (1995).

Definition 2: A feasible allocation X is *animal-including Pareto efficient* (AIP) if there is no other feasible allocation X' such that $u_i(X') \geq u_i(X)$ for all $i = 1, \dots, n$ and $A_j(X') \geq A_j(X)$ for all $j = 1, \dots, m$, and at least one of the following two conditions is fulfilled: (i) $u_i(X') > u_i(X)$ for some i and (ii) $A_j(X') > A_j(X)$ for some j .

Thus, an allocation is AIP if there is no other 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. Maximization of the SWFs associated with the different hypotheses subject to a resource constraint then directly implies that *Normative Proposition 1* is inconsistent with both AIP and AEP, *Normative Proposition 2* is consistent with AEP but inconsistent with AIP, and *Normative Propositions 3, 4, and 5* are consistent with AIP but inconsistent with AEP.

3.2 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. Yet, the relationships between welfare changes and individual willingness-to-pay measures are of course less straightforward when we also consider the welfare of animals. As is common in the literature on welfare measures, we abstract from distributional issues through aggregation issues.⁸ In this subsection this is done by only considering a single representative individual with initial income x ; for notational simplicity we will also only consider a single representative animal with well-being A and a single measure of environmental quality E .⁹ In the next sub-section we will instead consider many individual case 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 weight is given to animal suffering *per se* whereas instrumental human welfare effects caused by animal suffering are taken into

⁸ 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 system, such as the income tax system, rather than through legal regulations.

account. Recalling that w is an ordinal function, any monotonic transformation of W , such as $W' \equiv w^{-1}(W) = u(x, A(E), E)$ – i.e., the utility function itself – is an equally valid SWF. The $MWTP$ for an increase in E is then clearly given by the slope of the indifference curve:

$$MWTP \equiv - \left. \frac{dx}{dE} \right|_u = \frac{\partial u / \partial E}{\partial u / \partial x} + \frac{\partial u / \partial A \partial A / \partial E}{\partial u / \partial x}, \quad [10]$$

where the first term reflects the $MWTP$ for an improvement in E holding animal suffering constant, while the second term reflects the $MWTP$ for the reduced animal suffering resulting from the improvement in E (through correspondingly reduced suffering for the individual). 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:

$$u(x, A(E), E) = u(x - WTP, A(E + \Delta E), E + \Delta E). \quad [11]$$

So far, we are within the framework of conventional welfare theory.

Consider next the case where animal well-being enters directly into the SWF, as in the remaining *Normative Propositions 1, 3, 4, and 5*, 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 [10] and [11] (provided of course that the individual is a utility maximize). However, these measures will then not fully reflect the welfare changes associated with the underlying SWF. In contrast, let us introduce the notion *social* marginal willingness to pay ($SMWTP$), reflecting how much of private income (in terms of consumption of the composite good) that *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, implying

$$SMWTP \equiv - \left. \frac{dx}{dE} \right|_w = \frac{\frac{\partial u}{\partial E} + \frac{\partial u}{\partial A} \frac{\partial A}{\partial E}}{\frac{\partial u}{\partial x}} + \frac{\frac{\partial w}{\partial A} \frac{\partial A}{\partial E}}{\frac{\partial w}{\partial u} \frac{\partial u}{\partial x}}. \quad [12]$$

⁹ The notations are then consistent with the ones used in Section II with $s = m = n = 1$.

Thus, we have two terms where the first one is independent of the SWF and the second reflects the intrinsic value attached to animal suffering. Comparing [12] with [10], we can observe that the first term of [12] is equal to the (private) $MWTP$, implying that we can rewrite [12] as

$$SMWTP = MWTP + \delta \frac{\partial A / \partial E}{\partial u / \partial x}, \quad [13]$$

where $\delta \equiv \frac{\partial w}{\partial A} / \frac{\partial w}{\partial u}$ gives the relative marginal weight given to animal welfare (on the margin) compared to an equally large amount of human suffering. *Normative Proposition 1* then implies that $\delta < 0$, hence $SMWTP < MWTP$, whereas *Normative Proposition 2* implies that $\delta = 0$, hence $SMWTP = MWTP$. When animal welfare has a positive weight in the SWF, consistent with *Normative Propositions 3-5*, it follows that $\delta > 0$ and $SMWTP > MWTP$.

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

$$w[u(x), A(E), E, A(E)] = w[u(x - SWTP), A(E + \Delta E), E + \Delta E, A(E + \Delta E)]. \quad [14]$$

While we cannot additively separate $SWTP$ into WTP and another term related to the intrinsic valuation of animal welfare (as we could for $SMWTP$), the corresponding relationships between $SWTP$ and WTP depending on the sign of δ hold here as well.

3.3 Welfare Measures with Many Individuals

In this sub-section 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 always the same for all individuals. We keep the assumption of a single representative animal with well-being A , which we may simply interpret as the aggregate sum of animal welfare, and a single measure of environmental quality E ; it is straightforward to generalize these assumptions.

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

$$W = \sum_i u_i(x_i, A(E), E) + \delta(A(E)), \quad [15]$$

where δ is a parameter with the same interpretation as the corresponding variable in the case above. Hence, it reflects the relative weight given to animal welfare (on the margin) compared to an equally large amount of human welfare. The individual utility function for an arbitrary individual k is also additively separable and given by¹⁰

$$u_k = x_k f(A(E), E) + g_k(A(E), E), \quad [16]$$

Substituting [16] into [15] implies

$$\begin{aligned} W &= \sum_i x_i f(A(E), E) + g_i(A(E), E) + \delta A(E) \\ &= X f(A(E), E) + \delta A(E) + \sum_i g_i(A(E), E) \end{aligned} \quad [17]$$

where $X = \sum_i x_i$ is aggregate income. Based on [10] and [16] we can express the private and as follows:

$$MWTP_k = \frac{x_k (\partial f / \partial A \partial A / \partial E + \partial f / \partial E) + \partial g_k / \partial A \partial A / \partial E + \partial g_k / \partial E}{f(A(E), E)} \quad [18]$$

Moreover, since social welfare only depend on aggregate private income X and E , such that we may write, $W = w(X, E)$, we can from [17] obtain the social marginal willingness to pay

¹⁰ Note that while the preferences differ through the functions g_k , the function linked with private income, f ,

as follows:

$$\begin{aligned}
SMWTP &\equiv - \left. \frac{dX}{dE} \right|_w \\
&= \sum_i \frac{x_i (\partial f / \partial A \partial A / \partial E + \partial f / \partial E) + \partial g_i / \partial A \partial A / \partial E + \partial g_i / \partial E}{f(A(E), E)} + \delta \frac{\partial A / \partial E}{f(A(E), E)} \quad [19] \\
&= \sum_i MWTP_i + \delta \frac{\partial A / \partial E}{f(A(E), E)}
\end{aligned}$$

where in the last step we have used [18]. Hence, we can observe that the social *MWTP*, reflecting 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 nominator of the ratio in the last term reflects the animal welfare change per unit of *E*, whereas the denominator reflects the (social) marginal utility of private income.

Similarly, we can, based on the same functional forms, express the private and social willingness to pay for a discrete change in environmental quality. By using [11] and [16] we obtain:

$$WTP_k = x_k \left(1 - \frac{f(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \right) + \frac{g_k(A(E + \Delta E), E + \Delta E) - g_k(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \quad [20]$$

Similarly, based on the SWF given by [17], it follows that

$$\begin{aligned}
SWTP &= X \left(1 - \frac{f(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} \right) \\
&+ \frac{\sum_i g_i(A(E + \Delta E), E + \Delta E) - \sum_i g_i(A(E), E)}{f(A(E + \Delta E), E + \Delta E)} + \delta \frac{A(E + \Delta E) - A(E)}{f(A(E + \Delta E), E + \Delta E)} \quad [21] \\
&= \sum_i WTP_i + \delta \frac{A(E + \Delta E) - A(E)}{f(A(E + \Delta E), E + \Delta E)}
\end{aligned}$$

where in the last step we have used [20]. 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

is identical for all.

animal welfare due to the change in E , whereas $f(A(E + \Delta E), E + \Delta E)$ reflects marginal utility of income (at the environmental quality $E + \Delta E$). While this specific result of course hinges upon the restrictions of the utility function and on the utilitarian augmented SWF , it is a natural benchmark results when distributional effects between individuals are not considered essential. Note also that for the case where marginal utility of income is approximately constant in the intervals considered, we may simplify [21] further, as follows:

$$SWTP \approx \sum_i WTP_i + \delta \frac{\partial A / \partial x}{\partial u / \partial x} \frac{A(E + \Delta E) - A(E)}{\partial A / \partial x} \quad [22]$$

where $\partial u / \partial x$ is the (common for all) marginal utility of income and where $\partial A / \partial x$ can be interpreted is the marginal utility of income for animals, i.e. how much animal welfare that one at most can get by an alternative use of the last dollar spent. [22] then shows that social WTP for an improvement in E is given by the sum of individuals' WTP plus a term consisting of the product of the relative weight that animal welfare has in the SWF compared to private welfare (δ), a ratio reflecting how much animal well-being that at most can be obtained by reducing human well-being by one unit $\left(\frac{\partial A / \partial x}{\partial u / \partial x} \right)$, and finally the animal well-being caused by the environmental improvement, normalized by the marginal utility of income for animals $\left(\frac{A(E + \Delta E) - A(E)}{\partial A / \partial x} \right)$.

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. ANIMALS AND MORAL 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 been considered to be distinctly inferior to humans and have even been treated as objects rather than subjects from an ethical point of view. It is sometimes argued, however, that Greek philosophy in general, and Aristotle in particular, has been even more influential in this tradition.¹¹ 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” who could not 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

¹¹ 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?”

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 (2004), this change was largely due to the early utilitarian philosophers. For example, Jeremy Bentham, in the same section as his famous initial quotation 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.

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 for ever condemned. (Mill, 1874)

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 towards the animal suffering *per se*, and not towards 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, 1907, Book 4, Chapter 1)

Many contemporary utilitarians hold similar views, of which Peter Singer 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)

Largely starting with Singer in the early 1970s, the philosophical literature related to animal welfare has virtually exploded. According to Tom Regan (1990, xi), it is not an overstatement of the case to say that “within the past 20 years contemporary moral philosophers have

written more on the topic of human responsibility to other animals than their predecessors had written in the previous two thousand years.” And since 1990, the philosophical interest in various aspects of the relations between humans and animals has increased even further; see e.g., Sunstein and Nussbaum (2004), Derrida (2008), and Lurz (2009) for recent and much discussed contributions.

On the contrary, Immanuel Kant, perhaps the most influential rights or duty-based ethicist to date, argued (as quoted above) that animals are not part of the “categorical imperative” and have only instrumental values.¹² The most well-known contemporary rights-based ethical contributions are presumably *A Theory of Justice* by John Rawls (1971) and *Anarchy, State and Utopia* by Robert Nozick (1974).¹³ Although these authors came to very different conclusions regarding redistribution and the appropriate role of the state, as arguing for extreme egalitarianism based on maxi-min principles and virtually no redistribution/a minimal “nightwatchman” state, respectively, their views on how to deal with animals are surprisingly similar. Neither one 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.

¹² However, Johann Wolfgang Goethe shortly after 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.

¹³ Of which the rights in the philosophy of Rawls are induced through a contractarian approach, whereas Nozick

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. He exemplifies as follows (Nozick, 1974, 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 tradition, Tom Regan is the most well-known defender of explicit animal rights. He argues that higher animals in principle should have the same rights as human beings (e.g., Regan, 1983, 2001, 2003).

Although Singer and Regan are certainly not representative for philosophers as a group, from reviewing the literature it nevertheless appears that most current philosophers, of either tradition, who have expressed any view on the matter, tend to be of the opinion that animals should at least be given *some* intrinsic weight and that we have some responsibility toward them. Thus, in terms of our hypotheses, most current philosophers appear to support

ultimately relies on a natural-rights approach.

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, 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. EVIDENCE FROM A SWEDISH SURVEY

In the last section, we saw that moral philosophy does not provide much support for always relying on the conventional anthropocentric assumption. In this section, we will investigate whether laypersons tend to be more supportive by analyzing the results from a recent survey of laypersons' ethical values. Let us first reflect briefly on where our ethical values and perceptions come from. According to Bromley (2006, 1):¹⁴

As social beings, we tend toward – indeed, we are defined by – social beliefs. The essence of socialization is precisely the stabilization of beliefs. And stabilized beliefs define for us what is normal, correct, right. It could not be otherwise.

5.1 The Survey and Basic Results

The survey was mailed to 2,450 randomly selected adults above age 18 in Sweden; the response rate was 45%. Due to missing responses to particular questions, the number of observations included in the analysis varies from 1,032 to 1,072, i.e., 42-44% of the total selected 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. We

¹⁴ Herrmann et al. (2010) provide interesting recent empirical evidence on how children change their perceptions of animals in relation to human beings over time. Yet, as the authors point out, these processes of course differ among cultures and also change over time.

have an over-representation of university-educated people and a slight over-representation of women. Of course there are possible biases, which will be further commented on at the end of this section.

In order to test the anthropocentric assumption, the respondents were asked about how animal suffering, per suffering unit, should count compared to 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.¹⁵

<<Table 1 about here>>

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 percent 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 (43.5%) believe that animal suffering should count intrinsically yet not as much as human suffering, corresponding to *Normative Proposition 3*. Overall, the responses on 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 environmental valuation literature in particular and in the

¹⁵ 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 how each respondent interpreted the question.

economics literature in general. In order to look into the determinants of the variation in ethical preferences, regression analysis is used, which is what we turn to next.

5.2 Econometric Analysis

Since the main variable under investigation, 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 to 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 of the ethical preferences.

<<**Table 2 about here**>>

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 to men, which is clearly not only highly significant (in a statistical sense) but also substantial. This result can be compared both with Eckel and Grossman (1998), who present evidence from dictator games that women tend to behave more altruistically than men, and with 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. 0). While the former suggests that our

finding may simply reflect that women are more altruistic (in this case towards 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.¹⁶ The third probit regression reveals that women are 20 percentage points more likely to choose any of the extreme alternatives, which is of course largely driven by the fact that they are more likely to choose the alternative where animal suffering are 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 the support for vegetarianism and the animal-rights movement appears to be particularly strong among the younger ages. 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 toward 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 tends to 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

¹⁶ That the effect is much larger in the second probit regression is not surprising since more than 10 times as many chose the alternatives where animal suffering is given equal (or more) weight compared to the alternatives where they are not given any intrinsic weight; hence the relative magnitude should not be interpreted as a disproportionately large gender effect in the upper end of the distribution.

surprising given the historical development described above, although it is not directly obvious since contemporary Christian theology emphasizes both that human beings are superior to animals and that animals are part of God's creation and should therefore be treated well. However, given that the responses on average give considerable weight to animal suffering, the result appears logical.

The negative effect of university education may seem more surprising. Yet, one possibility 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 making 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.¹⁷ Somewhat similarly, while those who live in big cities (by Swedish standards) on average have no different opinion about the extent to which animal suffering should matter (compared to those who do not live in big cities or in the countryside), they are significantly less likely to choose an extreme alternative. Finally, there appears to be no effect of income or political preferences, corrected for other variables, on the extent that one thinks that animal suffering should matter

¹⁷ 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 four percent 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.

in public decision making.

5.3 Should We Trust the Survey Results?

In contrast to many other social scientists, economists are generally quite 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 methodologies, and the interest in using survey methodology has increased recently within many fields of economics.¹⁸ 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 act, 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, it is 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, nor that most people would be against publicly funded foreign aid. Similarly, one cannot conclude that a person who buys caged chicken would be against a

¹⁸ Examples include happiness research (e.g., Di Tella *et al.*, 2001, 2003; Luttmer, 2005), concerns about relative income (e.g., Johansson-Stenman *et al.*, 2002; Solnick and Hemenway, 2005), wage setting in labor economics (e.g., Agell and Lundborg, 2003; Agell, 2004), trust and social capital measures (e.g., Knack and Keefer, 1997; Zack and Knack, 2001), views about distributive justice and redistributive policy (e.g., Alesina and La Ferrara, 2005; Corneo and Fong, 2008), and judgments of morality in social dilemmas (Cubitt *et al.*, 2011).

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. A considerable amount of newer 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.¹⁹ If, on the contrary, others free-ride, they want to free-ride too. 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.

One 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.²⁰ 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 compare to human suffering; cf. Kahneman et al. (1999). One

¹⁹ 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.

²⁰ 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., both to those who had responded and to 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

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. If many respondents acted strategically with this goal in mind, one would have expected a higher fraction than that. There are also possible cognitive problems and associated potential 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.

However, although there are sometimes good reasons behind the economics research tradition to trust *what people do* rather than *what they say*, it would be very hard to infer these kinds of fundamental ethical values from observed behavior. Therefore, at least for values of this kind, it is easy to agree with Sen (1973, p.258) that “we have been too prone, on the one hand, to overstate the difficulties of introspection and communication and, on the other, to underestimate the problems of studying preferences revealed by observed behaviour.”

6. DISCUSSION AND CONCLUSION

Based on moral philosophy and the general public’s ethical preferences, this paper has discussed whether there is reason to relax the anthropocentric assumption in economics, in particular when dealing with normative issues such as legislation and regulation. Little support for the narrow anthropocentric assumption was obtained based on the moral philosophical review and the public’s perceptions, as revealed by direct evidence from a new

also tend to have ethical preferences that put a high intrinsic weight on animal suffering and the environment.

survey. As far as the author knows, this is the first economics study that directly attempts to measure people's ethical preferences in these respects. Although there are reasons to suspect that the survey-based estimates are not very accurate, we can say with greater confidence 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 others about animal welfare. On the other hand, it is clear that in some non-Western countries such as India, animals are often treated with much greater respect.²¹

These findings can also be discussed in the light of environmental valuation studies. Several survey-based contingent valuation (CV) studies have found that many respondents do not want to, or simply refuse to, assign a monetary value in trade-offs involving animals and the environment (e.g., Spash and Hanley, 1995; Stevens et al., 1991). While there is evidence that, if pushed, most respondents are indeed willing to make trade-offs (e.g., Spash and Hanley, 1995), suggesting that most people believe that it is not always wrong to reduce some environmental quality aspect if the benefit side is sufficiently large, the reluctance to make trade-offs in the first place most likely says *something*. There is also stated preference evidence that many people are willing to pay non-negligible amounts in order to reduce animal suffering (e.g., Bennet and Blaney 2002), although the fundamental basis for this willingness to pay is less clear. A possible interpretation is that some respondents believe that nature, including animals and their well-being, has a value of its own irrespective of human well-being.

Such an interpretation appears also to be consistent with the common line of critique

²¹ For example, the High Court of Kerala in India recently applied Article 21 of the Indian constitution, which protects the right to live with dignity, on circus elephants; see Nussbaum (2006).

against CV studies saying that people's responses largely reflect the "warm glow" or the "purchase of moral satisfaction" feeling from contributing to a good social cause, rather than underlying preferences; see, e.g., Kahneman and Knetch (1992) and Kahneman et al. (1999). Yet, the most frequent format of CV studies, following Arrow et al. (1993), is the referendum format, where the respondents are asked whether they would vote *Yes* or *No* to an imaginary referendum, implying both an environmental improvement and a cost for all (or most) members of society, such as a tax increase. But why would people get a warm glow from voting *Yes* to such a question if others would also have to pay for the environmental improvement?²² While this is a non-trivial question to answer based on conventional theory, if people also care intrinsically about animal well-being and/or the environment, i.e., irrespective of the instrumental effects on other people's well-being, such a warm glow makes more sense.²³ Yet, it should be emphasized that although the patterns from environmental valuation studies appear to be broadly consistent with the survey evidence presented here, as well as with the philosophical review, it may nevertheless be based on other fundamental values.

²² As expressed by Michael Hanemann, a leading proponent of the contingent valuation method: "'Warm glow' is simply a red herring. I have seen no evidence that people get a warm glow from voting to raise their own taxes, whether in real life or in a contingent valuation study" (Hanemann 1994, p. 33).

²³ Partly consistent with this, there is evidence from meta-studies that people tend to have a larger hypothetical bias for public goods than for private goods (List and Gallet, 2001; Murphy et al., 2005). This may be interpreted as a stronger reason for *self-signaling*, i.e., that people want to signal to themselves that they are socially responsible (cf. Benabou and Tirole, 2002). There is indeed much evidence that people have an unrealistically positive view of themselves (e.g., Baumeister, 1998; Gilovich, 1991; Taylor and Brown, 1994). For example, in a survey of university professors, 94% thought they were better at their jobs than their average colleague (Gilovich, 1991, p. 77). Johansson-Stenman and Martinsson (2006) asked people about what characteristics were important to them when buying a car. Many considered environmental characteristics to be very important, whereas very few considered the status associated with a specific car to be important. However, when asked about what characteristics they thought were important *for others* when buying cars, the pattern changed dramatically: now status was very important and environmental concern less important. This indicates that people derive utility, or well-being, from seeing themselves in a positive light.

The philosophical review also revealed a dramatic change in the perception of animal welfare over time; today hardly anyone denies that animals do feel pleasure and pain.²⁴ This change in attitude has also affected legislation. 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.” Moreover, an increasing number of people are voluntarily donating money to animal rights organizations such as People for the Ethical Treatment of Animals (PETA); indeed, this organization claims on its homepage to have more than two million members. Thus, it seems that Bentham was right in presupposing a development toward greater concerns for animals, although we are certainly far 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 over the last decade or so have experienced a remarkable relaxation of the narrow *Homo Economicus* behavioral assumptions along several dimensions. For example, time-inconsistent preferences (e.g., O’Donoghue and Rabin 2006; DellaVigna and Malmendier 2006; Gabaix and Laibson 2006),

²⁴ It is of course not possible to measure animal welfare very accurately, yet there exist accepted measures based for example on physiology (e.g., immune function and hormonal status) and observed behavior. For an overview of issues related to our possibilities of measuring animal welfare, see Mellor (2009). Yet, some still insist that we cannot really know that animals experience pain. Singer’s (1993, 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...”

social comparisons (e.g., Oswald 2000; Johansson-Stenman, Carlsson, and Daruvala 2002; Luttmer 2005), and various types of non-selfish behavior (e.g., Fehr and Gächter 2000; and Falk et al. 2005) are now becoming part of mainstream economics. Moreover, the normative counterparts 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 tax responses to relative consumption comparisons (e.g., Aronsson and Johansson-Stenman 2008, 2010).

However, so far there has been less discussion about possible generalizations regarding the appropriate ethical assumptions underlying welfare economics.²⁵ The present paper calls into question the assumption of anthropocentrism and concludes that welfare economics should be generalized in order to encompass the idea that animal well-being should sometimes matter intrinsically. It also demonstrates how the theory of welfare measurements can be expanded to encompass intrinsic valuations of animal welfare.²⁶ 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. Allowing people's ethical preferences to depend intrinsically on animal suffering will also prove useful from a

²⁵ There is an emerging literature based on non-welfaristic welfare analysis applied on issues such as welfare work requirements (Besley and Coate 1992; Moffit 2006) and racial profiling (Durlauf 2006). However, this literature is motivated quite differently.

²⁶ See also Eichner and Pethig (2006) for generalizations of welfare theory to encompass such ideas and Ng (1995) for arguments in favor of a related idea, *welfare biology*. It should be noted, however, that the implications of such an extended welfare analysis is of course not always straightforward. For example, as noted by Blackorby and Donaldson (1992) and Blackorby, Bossert, and Donaldson (2005), reduced meat consumption would also imply fewer living cattle in the world.

positive point of view, e.g., in order to explain people's political opinions and voting behavior.

Finally, the obvious fact that many issues related to animal welfare are difficult to measure is of course 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?" Future research that uses other methods and samples is encouraged in order to test how robust the empirical results presented here are and to what extent they can be generalized.

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Table 1. Response distribution for the following question: *Society can reduce animal as well as human suffering through different, most often costly, measures. In order 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 to reducing an equal amount of suffering in a human being. 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 a much lower 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 a somewhat lower 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 human beings 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 have a higher weight than human suffering	3.2%

Note: number of observations = 1,072

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	<i>Mean value [std] of the explanatory variables</i>
Dependent variable	Relative weight given to animal suffering	Relative weight given to animal suffering	1 if animal suffering should not count <i>per se</i> 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 right-wing party	-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.