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Why non-use values should not be used

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Why non-use values should not be used

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Abstract: Many studies have been conducted to measure so-called existence and bequest values (non-use values) of environmental goods, works of art, or monuments of cultural heritage. This paper proves that a common notion of existence value is logically inconsistent with generally acknowledged principles in economic methodology and economics. Moreover it is argued that bequest values may cause a severely biased valuation. Hence, non-use values should not be used to evaluate public projects. Instead, it is important to take into account all present and future, actual and potential use values of a good.

Keywords: existence value, bequest value, non-use values, evaluation of public projects, moral epistemology

* An earlier version of this paper has been presented at the Annual Conference of the European Public Choice Society, Belgirate, Italy, 4-7 April 2002. As this paper draws a provocative conclusion, I have received just as many supportive referee reports as negative ones recommending rejection. As a matter of bad luck I never received two supportive reports from one journal. I wish to thank 6 referees for carefully considering my claims and for instructive comments that have lead to substantial revisions. The revisions include a change of title. I liked the earlier title "The existence value does not exit and non-use values are useless", but it claims just a bit too much.

1 Introduction

This paper addresses a specific problem of the economic evaluation of public projects. The economic theory of value is based on individual preferences. There is little discussion, however, about which entities are appropriate objects of preferences. While it is straightforward to define the domain of preferences in some applications of economic valuation, it is a sensitive issue in others. In the theory of consumer choice, for instance, bundles of private market goods constitute a suitable domain of preferences. However, it is not at all clear what should be in the domain of individual preferences when economic theory of value is applied to public projects. The debatable objects are the well-being of other individuals (usually termed "altruism") and the existence of entities such as, for example, an animal species, a natural monument or a work of art. This paper proves that a common notion of existence value, the value of mere existence, is inconsistent with generally acknowledged principles in economic methodology and economics. Moreover, it is argued that a particular type of altruism which gives rise to the so-called bequest value may cause a severely biased valuation. Hence, bequest value should be excluded from economic evaluation of public projects. My conclusions are in sharp contrast with many studies primarily in the field of environmental valuation which have been conducted to measure so-called existence and bequest values.¹ I claim that any attempt to measure existence value is flawed, and the measurement of bequest values is at best in vain, but more likely seriously misleading. As there is no standard terminology in the literature, the paper attempts to set the

terminology straight. However, the main claims of the paper are not merely terminological. The claim here is that the category of non-use values should be ignored in public decision-making. Instead, the aim of valuation studies should shift to give a full account of the use values of all present and future individuals, be they human or non-human.

"Existence value" has been used in different meanings. Since terminology seems to have led to confusion, the following section briefly reviews the literature on non-use values. Sections 3 and 4 are the core of the paper. Section 3 provides precise definitions of the relevant concepts and it presents the proof that existence value is incompatible with four basic principles of economic valuation. Section 4 states an impartiality condition and shows that bequest values violate this condition. The concluding section 5 summarises the results and explores their implications. It is argued that non-use values should not be used to evaluate public projects and an alternative valuation framework is suggested.

2 A brief review of non-use values in the literature

Traditional welfare theory suggests that – in the absence of externalities – a national park that cannot be maintained by collecting user fees should be closed down. Weisbrod (1964) has challenged this view. The fees collected may underestimate the true value of the park. Weisbrod's main argument is that there are people who anticipate visiting the park in the future, but in fact they never do. The *option* to use a good does not result in a market transaction, although it is valuable. Hence, according to Weisbrod, traditional welfare measures underestimate the value of such good.

Krutilla (1967) in an attempt to extend Weisbrod's argument has introduced existence and bequest motives into the discussion. According to Krutilla (1967, 781),

"there are many persons who obtain satisfaction from mere knowledge that part of wilderness North America remains even though they would be appalled by the prospect of being exposed to it."

Like option value, a value attached to the existence of, say, a species or a wilderness area would not show up in a welfare measure based on market transactions. In addition, Krutilla (1967, 784) points out that bequest motives are insufficiently represented in decisions on nature conservation because of their public goods characteristics.

In the literature on environmental valuation it is common to distinguish use values and non-use values of a good.² Unfortunately, the distinction is made in different ways. Since option value, existence value and bequest value do not immediately lead to market transactions, they have been termed "non-use values" (e.g. Hanley and Spash 1993, 65-66). Sometimes, the term "passive use value" is also used (e.g. Bjornstad and Kahn 1996). However, because a good's option value is clearly connected to its potential use, the option value may be classified as use value (e.g. Randall and Stoll 1983 or Kolstad 2000, 295-96). In the following I will adopt this terminology. All values fall into two broad categories: use value and non-use value.

The use value of a good is the value attached to the current, future, or potential use of the good. The use of the good can be direct, for example, the consumption of an apple, or indirect, for example, the oxygen production of a forest. A distinction between consumptive use, for example, hunting, and non-consumptive use, for example, bird watching, has also been drawn (e.g. Boyle and Bishop 1987). The value of the potential

use of a good is its *option value* and its *quasi-option value*. The option value of a good is the value of keeping the option to use the good. It can be interpreted as the value of insurance if future needs and circumstances are not yet known. The quasi-option value of a good is essentially the value of future information which improves the basis of decision-making concerning the use of the good.³

*The non-use value is attached to a good independent of its use. Non-use values fall into two categories, existence value and bequest value.*⁴

There are several meanings of "existence value" in the literature. Some authors use "existence value" for what is named "non-use value" here (e.g. Randall and Stoll 1983, Pearce and Turner 1990, 134, McConnell 1997 or Perman et al. 1999, 378). Pearce and Turner (1990, 135) hold the view that all existence value stems from different forms of altruism. According to Turner (1999, 24) existence value is a special form of altruism. Some authors' definitions of existence value are vague and they do not commit to a view on whether all existence value stems from altruism or not (e.g. Perman et al. 1999, 378). An explicit distinction between existence value and bequest value (altruism) is drawn, for example, by Lazo et al. (1997, 359) and Kolstad (2000, 296).⁵ Loomis (1988) introduces a utility function relating an individual's utility to the use of a natural resource and the knowledge that the resource exists. The value of the knowledge of the existence of the resource is, in turn, related others' use of the resource and their knowledge about its existence. Similarly, Bishop (1978) attributes existence value to the knowledge that something exists. Bishop and Welsh (1992) link existence value to "altruism towards animals and feelings of environmental responsibility". Hanley et al. (1997, 373) define: "Existence value is the value of mere existence of a resource, given that the individual has no plans ever to use it."

Broadly speaking, there seem to be two views on the nature of non-use values. According to the first view, all non-use values arise from some form of altruism, be it altruism towards current or future, human or non-human individuals. According to the second view, there also exists an existence value which is independent of altruistic motives. *Existence value is the value attached to the existence of a good independently of use of the good and independently of any altruistic motives.* As use and altruism are ruled out, two motives remain for a positive existence value, the knowledge that something exists and mere existence. The value of mere existence has been called intrinsic value and is supposed to reflect a moral view that certain goods, like, for example, the spotted owl or the Niagara Falls, have a right to exist.

In section 3, I take issue with the view that the knowledge of the existence of a good is a reasonable object of preference. Furthermore, I show that a value of mere existence is incompatible with fundamental economic and methodological assumptions. A rational individual cannot have a preference for the mere existence of a good (unless rather strong metaphysical assumptions are adopted).

If existence value is not a proper value category, it follows that all non-use value stems from altruism – what remains of the category of non-use values then is bequest value. There are different forms of altruism. Sen (1977, 92) distinguishes sympathy and commitment. "If the knowledge of torture of others makes you sick, it is a case of sympathy; if it does not make you feel personally worse off, but you think it is wrong and you are ready to do something to stop it, it is a case of commitment." Randall and Stoll (1983, 267) introduce the same distinction but use a different terminology. They note that vicarious consumption (sympathy) is a use value and they reserve the term "altruism" (commitment) for non-use values. The terminology that I adopt in the

remainder of this paper is as follows: *Bequest value is a non-use values that stems from altruism*, where altruism means commitment, not sympathy.

In section 4, I argue that the use of bequest values in economic valuation violates an impartiality condition. Hence, bequest values should be excluded from the evaluation of public projects. My argument is in line with but goes beyond Milgrom's (1993) claim that altruistic motives lead to double counting in willingness-to-pay studies.⁶

3 Why existence values should not be used

Conceptual problems of "existence value" have been noticed before. Aldred (1994) reviews different conceptions of existence value and their respective difficulties. He claims that these difficulties can be overcome by placing existence value in the wedge between individual welfare and individual choice. In Aldred's conception the existence value is essentially an altruistic value. Rosenthal and Nelson (1992) also notice the conceptual weakness of "existence value" by pointing out that everything can have existence value. Their examples include: "1968 Ford Mustangs, the performance of the U.S. defense forces following the Iraqi invasion of Kuwait, coal mining jobs in West Virginia, ..., or jobs anywhere" (Rosenthal and Nelson 1992, 118). They notice that there is no way to stop and conclude that the existence value should not be used in cost-benefit analysis. But they do not go further to a logical analysis of the concept. This gap is filled in the remainder of this section.

I will first discuss and reject the view that *knowledge* of the existence of a good matters. Then, I will show that the mere existence of a good cannot be a proper object of a preference.

Knowing that something exists can be very valuable. Knowing that grizzly bears exist in a national park can save your life when you go hiking. Knowing that the blue whale exists may trigger the wish to see one. Knowledge in such cases is connected to (positive or negative) use values. Knowledge or, more generally, information is a key element in decision-making. Additional information can improve decisions in the sense that the best action has a higher expected value if new information is expected to arrive, than the best action without further information. The value of information, the (partial) removal of uncertainties, gives rise to a quasi-option value.⁷ However, existence value as the value of the knowledge that a good exists is distinct from the value of information to upgrade decision-making. Krutilla (1967) does not refer to any informational value. Also Loomis's (1988) formal account of existence value makes no reference to the role of information in decision-making. Hence, I will rule out the interpretation that existence value is in fact a disguised quasi-option value.

But if existence value is independent of the value of information, then existence value as the value of the knowledge that x exists is categorically flawed. It fails to distinguish the value of an object and the ability to value the object. Suppose x is a bird and x is unknown to me. Hence, under the 'knowledge definition', it cannot have existence value. As I get to know that x exists, I will attach existence value to it. This makes existence value sensitive to the state of my knowledge. Suppose I built my house on the last habitat of x and x is unknown to me. Suppose, furthermore, that x is extinguished through my act. Given my ignorance, my valuation and my choice were right if it is

knowledge that causes existence value. This seems to be implausible. Ignorance may save me from moral blame, but it does not make my choice the right choice. Therefore, we cannot accept the view that existence value depends on the knowledge that something exists.⁸ Note also that this view is troublesome for empirical valuation studies using the contingent valuation method. In such studies people are usually informed about the good to be valued. Hence, on the 'knowledge definition' of existence value, contingent valuation would create the values it wants to measure.⁹

As the 'knowledge definition' must be rejected, it remains to be shown that existence value as the value of mere existence is incompatible with generally acknowledged principles in economics and economic methodology.

I will use the following definitions of the value concepts under debate which have been adapted from the literature.¹⁰

DEFINITION: *Use value* is the value of a good's current, future or potential use.

DEFINITION: *Non-use value* is the value of a good that is independent of its current, future or potential use.

In order to draw a clear terminological distinction between use values and non-use values I will say that individual i 's use of a (valuable) good x increases i 's well-being or makes i better off. And, if i is better off in the presence of x than without x , then i is using x . Value is reflected in i 's preferences which are defined over the set of all possible states of the world. Suppose i 's well-being is the same in two states s and s' , still i may prefer s to s' , since i may be motivated by other concerns than her own well-being.

We can now examine whether the mere existence of a good may be such other concern.

Existence value is defined as follows:

DEFINITION: *Existence value* is the value of the existence of a good independently of any value associated with its use and independently of altruistic motives.

The following principles are adopted.

MI Methodological Individualism All value is value for an individual.

OR Ockam's Razor The existence of an entity should not be admitted, if it can be avoided without loss.

VP Value as Preference Satisfaction For any two situations s and s' , where a good x is present in s but not present in s' while s and s' are equal otherwise, a good x is valuable for an individual i in situation s if and only if i prefers situation s to situation s' .¹¹

IG Individual Good For all individuals i , i cannot strictly prefer situation s to situation s' if there is no individual for whom situation s is strictly better than situation s' .

MI as stated above is the normative variant of the epistemological principle that "social phenomena can only be properly explained in individual terms" (Tännsjö 1990, 70). In the context of a theory of valuation (the purpose of which is not explanation but prescription, i.e. to identify best actions), the principle requires that social values – the

social evaluation of (environmental) goods or projects – are fully determined on the bases of individual values. **MI** is generally acknowledged in economics. This is clearly reflected in the way *social welfare functions* are constructed (cf. Bergson 1938; Arrow 1951). **MI** rules out that a good has value independently of the existence of an individual for whom the good is valuable.

OR is also a widely acknowledged methodological principle. **OR** states that one must not postulate the existence of an entity unless it is necessary for a consistent description and understanding of observed phenomena (Dancy 1985, 148). **OR** rules out, for example, the existence of a substance that has no causal connection to our universe. For an entity to exist there must be, at least in principle, a way of knowing that it exists. In the context of a theory of value **OR** rules out the existence of values which will under no condition influence the behaviour or well-being of the individual holding the value. That a good has value for some individual implies that there are, at least in principle, observable consequences.

VP phrases the economists' conception of the value of a good in the most general way. Note that it is not required for a good to have value that an individual consumes the good or that the good makes the individual better off. The premise of value as preference does not exclude the possibility of an existence value.

IG is a version of the person-affecting principle (Parfit 1984). It is motivated by the same intuition as the Pareto principle, which states that a situation s is better than a situation s' if s is better for someone and not worse for anyone. It is also similar to Broome's (1991) principle of personal good. However, there are two differences. First, I do not require that individual valuers are persons. We can say that a situation is better

for an individual who is not a person, but, say, a blue whale. Second, **IG** imposes a constraint on individual valuation (or preferences) rather than on social evaluation. **IG** allows for altruism, but it requires choosing according to one's own good when others' well-being is not affected.

The following proposition holds:

PROPOSITION 1: No good has existence value under any valuation satisfying principles **MI**, **OR**, **VP**, and **IG**.

Proof: The proof is by contradiction. We assume that a good has a (positive) existence value under some valuation and show that this violates at least one of the principles **MI**, **OR**, **VP**, and **IG**.

According to **MI** the only way a good x can have an existence value is that some individual i places value on x . We assume that i is the only individual who places value on x . Furthermore we assume that i does not attach value to any current, future or potential use of x . We are justified to assume this, because existence value is by definition independent of any use of the good. We also assume that i has no altruistic motives. This assumption is warranted, because existence value is assumed to be distinct from bequest value.

Consider two situations s_x and s_0 , where x is present in s_x , but not present in s_0 , all other features of the two situations being the same. Since x has no use value for i , i is not better nor worse off in situation s_x than in situation s_0 . i is not affected by x at all or i is affected in a way that does not change i 's well-being. (If x would cause a pleasant feeling or contribute to i 's well-being, x would have use value.)

Assuming that i places existence value on x , by **VP**, i has a preference for s_x over s_0 . By **OR** the fact that i places existence value on x must have some observable impact. Consider a situation s_x' which is similar to s_x in all respects, but i 's well-being is slightly reduced. This reduction of well-being can be arbitrarily small. Suppose now i is given the choice between s_0 and s_x' . For a sufficiently small reduction of i 's well-being and a positive existence value **OR** requires that i chooses s_x' . If i were not willing to give up some arbitrarily small amount of well-being for the existence of x , there would be no observable impact of holding that value. However, the choice s_x' out of $\{s_0, s_x'\}$ violates **IG**. It makes i worse off without making anyone better off, since, by assumption, i is the only individual who places value on x . Hence, **MI**, **OR**, **VP**, **IG** and a positive existence value are mutually inconsistent. QED.

To exemplify the argument, suppose Eve values the existence of the Maltese Falcon, but the Maltese Falcon does not affect any feature of the world that affects Eve's well-being. If she would enjoy watching the Maltese Falcon or if the Maltese Falcon would potentially contribute in any other way to make Eve's life better, the Maltese Falcon would have a use value for Eve. Let us assume it has not. Suppose, furthermore, that Eve is unconcerned about other individuals or all other individuals are unconcerned about the Maltese Falcon; then the Maltese Falcon does not have a bequest value for Eve. That Eve attaches an existence value to the Maltese Falcon means that Eve is willing to make at least a small sacrifice to protect its existence. Since the Maltese Falcon does not affect any feature of the world that makes someone's life better, Eve would be worse off making such sacrifice without anyone else being better off.

Moreover, since the Maltese Falcon does not affect any feature of the world that Eve cares about it could have any arbitrary set of features. The existence value, then, is a

value that is attached to nothing particular. It does not distinguish whether the Maltese Falcon is a living bird, a small statue, a strip of celluloid, or an image on a movie screen. A thing without recognisable features cannot be said to exist and it cannot have value. Ockam's razor cuts off a value that applies to everything regardless of its features; just as it cuts off a proclaimed value for which one is not prepared to move a finger.

4 Why bequest values should not be used

In the preceding section I have shown that existence values should not be used for the evaluation of a public project. The remaining type of non-use value is bequest value. In this section I argue that the use of bequest values may lead to biased judgement and should not be used in economic valuation of public projects.

It is useful to start with a definition:

DEFINITION: *Bequest value* is a non-use value that arises from altruism.

As there are different notions of altruism we have to introduce two distinctions.¹²

First, notice that altruism may give rise to use values as well as non-use values. Individual i holds an altruistic use value if i is made better off by an improvement of someone else's well-being. On the other hand, altruistic non-use values (bequest values) do not make i better nor worse off. Similarly, Randall and Stoll (1983) classify vicarious consumption as use value and distinguish three types of altruistic non-use values of a good Q : (i) interpersonal altruism if Q is available for contemporaries, (ii) intergenerational altruism if Q is available for future generations, and (iii) Q -altruism if

" Q itself is benefiting from being undisturbed." Let us adopt a conception of altruism that comprises commitment towards (i) current persons, (ii) future persons and (iii) other individuals.¹³ The important issue is rather whether and how bequest values (altruistic non-use values) should be accounted for in public decision-making.

To explore this, a second distinction between non-paternalistic and paternalistic altruism is important. Bergstrom (1982) distinguishes a case of pure benevolence where an individual values someone else's well-being (non-paternalism) from a case where an individual values someone else's consumption of a merit good (paternalism).¹⁴ He shows that any allocation that is Pareto optimal under non-paternalistic altruism is also Pareto optimal under selfish preferences. Hence, a project can be evaluated using selfish preferences. If a project would not be selected under selfish preferences, it would not be selected under non-paternalistic altruism. Why this is the case can best be demonstrated by means of an example.

Suppose a project gives a benefit b to n people and the total net benefit nb does not cover the cost of the project c . As $nb < c$ the project would not be selected under selfish preferences. Could the existence of non-paternalistic altruism change it into a good project? The answer is 'no'. Suppose beneficiaries share the cost equally. As $b < c/n$ they would be worse off with the project. A non-paternalistic altruist would not want to adopt such project. Suppose next, the altruist covers the cost. Now beneficiaries are better off and the altruist appreciates this. Still the project is not worth while. The non-paternalistic altruist could transfer a compensation c/n to each beneficiary instead of adopting the project. As $c/n > b$ the compensation payment makes beneficiaries better off than the project and, hence, is preferred by the altruist.

There are two limitations to Bergstrom's result. First, as shown by Flores (2002), it cannot be extrapolated to serve the purpose of cost-benefit analysis. Second, Bergstrom's analysis uses an ordinal framework to identify Pareto optimal allocations. An ordinal framework, however, is not suitable to consider distributional concerns. In welfare analysis with altruistic agents distributional concerns have first been raised by Johannson (1992, 611) and Diamond and Hausman (1994, 55), but they have not been explored in detail. Milgrom (1993) has argued that altruism leads to double counting. But his argument only addresses the issue of allocative efficiency.¹⁵ In the remainder of this section I discuss distributional aspects of altruistic valuation and show how non-paternalistic altruism and paternalistic altruism violate an impartiality condition. Impartially requires that the evaluation of an economic project gives equal weight to the well-being of each individual. This principle can be phrased as follows:

EC Equal Consideration of Individual Good Each individual's well-being receives the same weight.

EC can be interpreted as an anonymity condition which is widely used in social choice theory (e.g. Sen 1970, 68). Decision-making on public projects should be neutral with regard to the identity of individuals who benefit or suffer from a project.

To state the next proposition we distinguish universal non-paternalistic altruism from limited altruism. An universal non-paternalistic altruist gives the same weight to the well-being of each individual while a limited altruist does not. The following propositions holds:

PROPOSITION 2: (a) If bequest values are based on limited altruism, accounting for bequest values is incompatible with **EC**.

(b) If bequest values are based on universal altruism, accounting for bequest values is redundant.

Proof: To prove part (a) of the proposition it is sufficient to construct an example where the use of the bequest value leads to a bias.

First, consider the case of non-paternalistic altruism. Suppose, there is a society of n individuals. The preferences of all individuals i are represented by a value function v_i that depends on individual well-being (w_1, \dots, w_n) .¹⁶ Suppose, furthermore, individual k , the king, say, is selfish, i.e. he cares only about his own well-being: $v_k = w_k$. All other individuals care about their own and the king's well-being: $v_i = w_i + w_k$ for all i other than k . Consider two competing projects A and B . A is a project that gives one additional unit of well-being to everyone but the king. B is a project the gives one additional unit of well-being to the king. Hence project A generates $n - 1$ units of value and project B generates n units of value. Clearly, the choice of B instead of A violates **EC**. Similar cases can be constructed for the case of paternalistic altruism, where j 's consumption is an argument in i 's value function.

To prove part (b) of the proposition we have to show that the selection of a project is independent of bequest values based on universal non-paternalistic altruism.

Suppose a project A generates the highest use value (well-being) of all available projects and the selection of A satisfies **EC**. By definition an universal non-paternalistic altruist will prefer the same project. The consideration of universal non-paternalistic altruism will not change the ranking of projects and is, thus, redundant. QED.

The inclusion of bequest values in economic valuation will either be redundant or lead to an absurd discrepancy between economic valuation and the concern for individual

well-being. Moreover economic valuation would be highly sensitive with regard to existence and structure of altruism in society.

To be sure, this does not deny the existence and importance of altruism. Rather, the argument implies that altruistic non-use values (bequest values) should not be used to evaluate public projects. The argument does not rule out that a kidney should be allocated to a young mother whose children enjoy their mother to be alive and happy, rather than to a person with no relatives. But a full discussion of these issues goes beyond the scope of the current paper.

Finally, note that under a hedonistic interpretation of preference satisfaction as happiness, if i has altruistic motives towards j , then j 's happiness contributes to i 's happiness and is a use value for i . In such a framework there is no room for non-use values anyway. However, the arguments in this paper bear no commitment to such a view.

5 Conclusions for a valuation framework

In this paper I have traced the conceptual difficulties of "existence value" to their logical roots. Any attempt to measure existence value must invoke strong metaphysical assumptions which violate at least one of the principles of Methodological Individualism, Ockam's Razor, Value as Preference Satisfaction or Individual Good. Furthermore, I show that the use of bequest values in economic evaluations of public projects may lead to severely biased judgements – a violation of the principle of Equal Consideration of Individual Good. Since existence value and bequest value exhaust the

category of non-use values, I conclude that the attempt to measure non-use values is in vain or even misleading.

In contrast to my claims, non-use values have made their way from theoretical discussion to empirical investigations. How can existence value be inconsistent with basic economic and methodological principles when it has been quantified in many studies?¹⁷ The answer lies in the problems of the contingent valuation method which is used for the measurement of non-use values.¹⁸ Cummings and Harrison (1995) review a number of studies on the measurement of non-use values. They conclude that there is no operationally meaningful way to decompose use values and non-use values. Kahneman and Knetsch (1992), Diamond and Hausman (1993, 1994), Diamond (1996), and Fisher (1996) have criticised the contingent valuation method because it does not assess the preferences it is meant to assess.

The claim of this paper is that non-use values should not be used to evaluate public projects or policies. This has significant consequences for empirical valuation studies. In particular contingent valuation studies should not try to assess the willingness to pay for moral attitudes. Instead of trying to assess individuals' willingness to pay for existence and bequest, the task is rather an assessment of all current and future, actual and potential use values of all (human and non-human) individuals holding values. Such a research programme has a clear conceptual basis.

One might be worried that the rejection of non-use types of altruism, i.e. bequest value, will lead to a neglect of important concerns for future generations and non-human individuals. But this is not so. I believe the motivation to measure bequest value is fully acknowledged if all use values are counted.

First, notice that all bequest value originates from use value. The argument for this is straightforward. Suppose there is a queue of all individuals with preferences. Suppose individual 1 places no use value on a good x ; but she places a bequest value on x because individual 2 values the good. We have to consider 2's motives. If 2 attaches use value to x , the argument is complete. If 2 values x for its bequest value, that is, because 3 values x , we consider 3's motives. And so on. If a good has no actual or potential use for some individual now or in the future, then it does not have a bequest value. Ultimately bequest value must be based on a use value for someone. The principle of the individual good introduced in section 3 does not permit infinite chains of bequest values that do not ultimately lead to some use value.

Second, to count the (potential) use value for future individuals of, say, a species which has been protected, is a more direct (and less biased) procedure than to enquire about current individuals attitudes toward the future. Consider the evaluation of a project to protect the blue whale. Suppose the project would ensure the survival of a certain population of blue whales. A conventional study would try to assess the willingness to pay of the current (human) population for such project. The concern of future generations would be captured *via* the bequest value and to the extent that altruism towards future individuals prevails. The bequest value also captures altruism towards the blue whale. But notice that a contingent valuation study captures the concern of the blue whale, presumably a being with interests, only conditional on and to the extent that altruism prevails in the current human population. By contrast, a full evaluation of the project based on use values would try to assess the effects of the project (that a population of blue whales survives) on the well-being of current and future humans, whales and other individuals with interests.

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¹ For example, the studies by Brookshire et al. (1983), Schulze et al. (1983), Boyle and Bishop (1987), Madriaga and McConnell (1987), Bowker and Stoll (1988), Loomis (1988), Stevens et al. (1991), Silberman et al. (1992), Brouwer and Slangen (1998) and Kotchen and Reiling (2000); see also Loomis and White (1996) for an overview of studies.

² The distinction has made its way into most text book chapters on environmental valuation; see e.g. Field (1997), Perman et al. (1999), Kolstad (2000), or Hanley et al. (2001).

³ See Bishop and Woodward (1995) and Ready (1995) for detailed surveys of option value and quasi-option value, respectively. The option value concept has been introduced by Weisbrod (1964). Quasi-option value was first discussed by Arrow and Fisher (1974) and Henry (1974).

⁴ This terminology is also broadly in line with, for example, Turner (1999, 20-21) and Kolstad (2000, 296).

⁵ The distinction is made implicitly in Randall and Stoll (1983) if their concept of *Q*-altruism is applied to natural monuments such as the *Grand Canyon*. For such cases, *Q*-altruism is a misnomer; see section 4. Aldred (1994) provides a detailed discussion of terminology and concepts. Pearce and Turner (1990, 134; emphasis P. & T.) define: "Existence value is a value placed on an environmental good and which is *unrelated to any actual or potential use of the good*." Perman et al. (1999, 378) state: "Existence value arises from the knowledge that the service exists and will continue to exist, independently of any actual or prospective use by the individual." Kolstad (2000, 296; emphasis K.) defines: "Existence value is the value a consumer attaches to *knowing* something exists. This would be in addition to any value associated with actual or potential 'use'."

⁶ In a seminal paper Bergstrom (1982) has shown that non-paternalistic altruism – the concern for others' well-being – is irrelevant for valuation. By contrast paternalistic altruism, when someone is concerned not with others' well-being but with other's consumption, *does* affect the valuation of a project (Jones-Lee 1992). See McConnell (1997) for an analysis of mixed cases of paternalistic and non-paternalistic altruism, Ahlheim and Schneider (1996) for a comprehensive overview of concepts and Johansson (1993, 128-132) a concise treatment of altruism in cost-benefit analysis.

⁷ Cf. the references in footnote 3.

⁸ See Milgrom (1993, 419) for a similar argument.

⁹ For a recent survey of contingent valuation see Carson et al. (2001).

¹⁰ See, for example, the text books by Pearce and Turner (1990, 129-37), Hanley et al. (1997, 372-76), Perman et al. (1999, 378-79), or Kolstad (2000, 296).

¹¹ For the sake of simplicity of presentation the argument is restricted to positive values. An argument for negative values can be constructed in the same way.

¹² I will not discuss Andreoni's (1990) concepts of pure and impure altruism. According to Andreoni pure altruism is a preference for a public good. With such a preference one would be willing to contribute to the good's provision and thereby benefit others. Impure altruism refers to an additional "warm glow" of giving. Andreoni's notion of pure altruism is a misnomer. The contribution to the public good stems entirely from selfish motivations, that is, one's own use of the good. Impure altruism also falls into the category of use values as the act of giving makes the donor better off. In addition impure altruism is selfish in the sense that the act of giving is relevant for the donor, not its consequences for the recipient.

¹³ Q must be an entity that can benefit, i.e. it must make sense to say that Q is better off in one situation than in another. Otherwise Q -altruism is not a form of bequest value, but rather some form of existence value; see footnote 5.

¹⁴ See McConnell (1997) for a discussion of mixed cases.

¹⁵ Moreover, Milgrom's argument has been challenged by Ahlheim and Schneider (1996).

¹⁶ Note that v_i satisfies **IG**.

¹⁷ See footnote 1 for a sample of references.

¹⁸ See Hanley and Spash (1993, 53 ff.) for a short overview and Carson et al. (2001) for a recent survey.