

Arrhenius' *Population Ethics*

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In his brilliant and ingenious book *Population Ethics: The Challenge of Future Generations*, Gustaf Arrhenius gives the most rigorous and detailed examination of major theoretical alternatives¹ to date. What is more, he provides proof for several impossibility theorems to the effect that no normative theory—axiological or moral—can satisfy the intuitive principles of population ethics simultaneously. This is a great achievement, and no future population ethicists can argue about the issues without reference to this work. It is a great honor to give comments on this treatise.

I find no definitive fault with Arrhenius' arguments, but I am not fully convinced, either. In what follows, this paper raises some questions concerning I. the framework of the debate, II. the alleged principles and assumptions, III. argumentation from the principles to the Impossibility Theorems, IV. the possibility of satisfying the deflated principles, and V. the implication and significance of the Impossibility Theorems. Note that these are questions and comments on the July 2015 version of *Population Ethics*², a manuscript that might well be revised before its publication.

I. Questions about the framework of the debate

1 Positive, Negative, and Neutral Welfare

One fundamental assumption Arrhenius makes is that there is an objective positive/negative polarity. Because many principles or “adequacy conditions” presuppose the distinction between positive and negative welfare, one way to avoid the Impossibility Theorems is to deny the distinction and reject the adequacy conditions that presuppose it.³ About this assumption, Arrhenius claims that:

The assumption that there are lives with positive or negative welfare is standard in the literature on population axiology and it is so commonsensical that it is hard to find any further arguments for it. Values in general have a positive/negative polarity—things are good or bad, beautiful or ugly, attractive or repugnant, agreeable or disagreeable, and so on—and welfare in particular displays this

feature: lives or periods of lives can be happy or unhappy, wonderful or horrible, pleasant or unpleasant, satisfying or dissatisfying, fulfilling or disappointing, tormenting or soothing, and so on. (p. 23)

Actually, because Arrhenius claims that there is a neutral life (see section 2), he is committed to the tripartite absolute distinction between the positive, the neutral, and the negative in value. While this assumption is “the standard in the literature on population axiology”, it is not sacrosanct.

It is true that we talk about well-being in, say, negative terms, but usually this talk of negative welfare is relative and not absolute. That is, the expression “negative well-being” is just our way of talking about the loss of well-being *relative to certain content-dependent standard or benchmark*. For example, when someone’s life is miserable in comparison to other people’s, then we tend to say that he suffers a bad life. But if we knew that the level of his current life is better than that of his past life, we might say that he enjoys a decent life. What we say is also affected by the evaluator’s belief about the level that the subject ought to enjoy. If, for example, we believe that people should enjoy the level of well-being that the majority of the industrial countries do, then we might judge that those who enjoy lesser levels of well-being lead bad lives.

I think that the existence of the context-dependent uses of negative (neutral and positive) value terms is undeniable. Philosophers in population axiology try to use value terms context-independently, I suppose, but I am unsure whether there really is such an absolute distinction⁴. When we imaginably order lives from better to worse, I find gradual change but no jump between them. I think Arrhenius shares this intuition because he criticizes Superitarianism basically for the same reason (see section 4). If so, why does he believe that at some point in the ordering of lives, there is a qualitative shift from good through neutral to bad? This qualitative shift is all the more puzzling because it is supposed to have very substantial implications via various adequacy conditions, for example, The Negative Mere Addition Principle (contrasted with The Mere Addition Principle) and The Non-Sadism Condition, which Arrhenius uses to prove Impossibility Theorems.

The Negative Mere Addition Principle: An addition of people with negative welfare makes a population worse. (p. 98)

The Mere Addition Principle: An addition of people with positive welfare does not make a population worse, other things being equal. (p. 91)

The Non-Sadism Condition: An addition of any number of people with positive welfare is at least as good as an addition of any number of people with negative welfare, other things being equal. (p. 102)

2 The Characterization of a Neutral Welfare Component

Arrhenius proposes a way to set the neutral level of life, which might erase my suspicion that there is no absolute distinction between the negative, the neutral, and the positive. He tries to define a neutral life in the following way:

(7) A Life has neutral welfare if and only if it is equally as good for the person living it as a neutral component. (p. 33)

This definition calls for the characterization of a neutral welfare component, which is as follows:

(***) A welfare component is neutral relative to a certain life x if and only if x with this component has the same welfare as x without this component. (p. 34)

This only defines neutral components relative to a certain life. It often happens that a state of affair has no effect on one life while it has some positive (or negative) effect on another life by, for example, making some desire satisfied, arousing pleasure, or combining with other components in her life to constitute an organic unity in Moore's sense⁵, which does not happen to the other life.

To compare the welfare levels of several lives vis-à-vis a common neutral level, Arrhenius needs to characterize neutral components common to all these lives. The above characterization of neutral welfare components falls short in this respect. Moreover, suppose that one and the same individual could go through different courses of life. For example, Arrhenius could lead the life of an eminent philosopher as he is now or that of an axe-wielding Viking. Or more realistically, he could have a different family and a different position in the society. Then, the definition (***) does not settle the neutral level common to the different lives one and the same individual could lead,

for a neutral component would be different for different lives.

Note also that even if we suppose the existence of an absolute neutral level, it does not guarantee that both the positive and the negative levels of welfare exist. As the absolute temperature has the neutral level but no negative level, the welfare measure might not involve negative numbers. The usual representation of QALY (Quality Adjusted Life Years) has this structure (e.g. Nord 1999), and I think Arrhenius needs more than intuitions to say otherwise. Can he show that welfare is like electric charge, about which it is natural to distinguish between the positive and the negative?

Wondering whether there is an absolute distinction between negative, neutral, and positive welfare, for the sake of argument I will grant this distinction in the foregoing.

II. Questions about the alleged principles and assumptions

3 The Need of Knowledge Requirement in the Normative Adequacy Conditions?

In the proof of six axiological impossibility theorems (Chapter 11) and two moral impossibility theorems (Chapter 12), several adequacy conditions are introduced. For example:

The Normative Egalitarian Dominance Condition (exact formulation): For any choice situation C , and any welfare level \mathbf{W}_x , **if** $A \subset \mathbf{W}_x$, all members of B have welfare below \mathbf{W}_x , $N(A)=N(B)$, $A(A) \subset C$, and $A(B) \subset C$, **then** all actions in $A(B)$ are wrong, other things being equal. (p. 378; “A”, “B”, etc. stand for populations, “ $N(X)$ ” stands for the number of the members of the population X , and “ $A(X)$ ” stands for the sets of the actions that bring about the population X)

I am unsure of some of the adequacy conditions for specific reasons⁶, but let me pass over them. I will focus on a common feature of all these moral adequacy conditions. These adequacy conditions do not involve reference to the epistemic situation of the agent. Some theories might not accept these conditions for that reason. For example, in the choice situation that the Normative Egalitarian Dominance Condition specifies, if you do not know which actions are available, what outcomes each of them will have, or what evaluative relations these outcomes have (i.e., which welfare levels are higher, which population are more equal welfare-wise, etc.), and choose $A(B)$, have you done a wrong thing? If you do not think so, you need to add some epistemic element to the

adequacy conditions to make them acceptable.⁷ For example, the Normative Egalitarian Dominance Condition can be modified as follows:

The Knowledge-relative Normative Egalitarian Dominance Condition: For any choice situation C , and any welfare level W_x , if an agent α knows that α is in C , $A \subset W_x$, all members of B have welfare below W_x , $N(A)=N(B)$, $A(A) \subset C$, and $A(B) \subset C$, then all actions in $A(B)$ are wrong, other things being equal.

This change can affect Arrhenius's conclusion that no coherent moral theory can satisfy all the adequacy conditions. For perhaps it is at least nomologically impossible for humans to satisfy the knowledge condition in the cases the proofs deal with; human limitations and the complexities of the world prevent us from achieving the required knowledge, particularly knowledge about exactly how various populations would fare. Perhaps normative theories can coherently accept all the modified normative conditions, insisting that the knowledge requirement is not satisfied in such cases. Perhaps in merely metaphysically possible worlds, the knowledge conditions are satisfied, but is a moral theory supposed to accommodate such cases?

4 Begging the Question against Superitarianism?

Welfare Superitarianism accepts the following condition (p. 151 and Chapter 11):

Welfare Superiority: The addition of lives with positive welfare always increases the aggregate welfare of a population but the aggregate welfare of a sufficiently large number of lives n with very high positive welfare is greater than the aggregate welfare of any number of lives with very low positive welfare. (p. 138)

Welfare Superitarianism is accused of violating the Inequality Aversion Condition. And apparently the reason that this violation is problematic is that this condition is entailed by the Non-Elitism Condition.

The Inequality Aversion Condition: For any triplet of welfare levels A , B , and C , A higher than B , and B higher than C , and for any population A with welfare A , there is a larger population C with welfare C such that a perfectly equal population B of the same size as $A \cup C$ and with welfare B is at least as good as $A \cup C$, other things

being equal. (p. 145)

The Non-Elitism Condition: For any triplet of welfare levels **A**, **B**, and **C**, **A** slightly higher than **B**, and **B** higher than **C**, and for any one-life population **A** with welfare **A**, there is a population **C** with welfare **C**, and a population **B** of the same size as $A \cup C$ and with welfare **B**, such that, for any population **X** consisting of lives with welfare ranging from **C** to **A**, $B \cup X$ is at least as good as $A \cup C \cup X$, other things being equal. (p. 150)

The proof that the “Non-Elitism Condition implies the Inequality Aversion Condition” exploits “the fact that the difference between any two welfare levels consists of a finite number of “slight welfare difference” (p. 151), i.e. the assumption that “the order of welfare levels is fine-grained” (p. 24) so that the difference between two consecutive welfare levels is small. However, it seems that if you were a welfare superitarian, you would naturally reject this assumption as well as the Non-Elitism condition. It appears that the argument against Welfare Superitarianism begs the question.

5 Would the Guardian Angel Choose Existence with Positive Welfare over Non-existence?

The guardian angel model is introduced in order to answer the Non-Identity Problem (Parfit 1984, Ch. 16) and show that existence with positive welfare is better for a person than non-existence (p. 249f).

According to the guardian angel approach, an outcome **A** is better for a person than another outcome **B** if and only if this is what her guardian angel would choose for her sake. (p. 249)

Again, it seems reasonable to say that ... in the choice between bringing *p* into existence with positive welfare or not bringing her into existence at all, one ought to prefer the former for *p*'s sake (pp. 251-252)

For the sake of argument, let me grant that there is the absolute distinction between the positive, the neutral and the negative level of well-being. Still, intuitively, even given that the “a guardian angel would be willing to choose for a person when they only take

into account what is in the interests of the person under consideration” (p 249), the angel might not choose/prefer the former over the nonexistence of p for p 's sake. This is so especially when, as is assumed here, p enjoys a positive but very low welfare-level life. Unless we presuppose that existence with positive welfare is better for a person than non-existence and beg the question, we would probably not get the desired conclusion.

III. Questions about argumentation from the principles to the Impossibility Theorems

6 Ceteris Paribus Clause and the Proof of the Impossibility Theorems

All of the adequacy conditions contain a ceteris paribus clause. For example, in the proof of the first axiological theorem, we find:

The Quantity Condition (exact formulation): For any two positive welfare levels \mathbf{W}_x and \mathbf{W}_y , such that $x=y+1$, and for any population size n , there is a population size $m > n$, such that **if** $N(A)=n$, $N(B)=m$, $A \subset \mathbf{W}_x$, and $B \subset \mathbf{W}_y$, **then** B is at least as good as A, other things being equal. (p. 306; an underline added)

And the proof includes such steps as follows:

(3) $n_{i+1} > n_i$ be a number which satisfies the Quantity Condition for $\mathbf{W}_{u-(i-1)}$, \mathbf{W}_{u-i} , and n_i for all i , $1 \leq i \leq r$;

(4) $A_i \subset \mathbf{W}_{u-(i-1)}$, $N(A_i)=n_i$ for all i , $1 \leq i \leq r+1$.

From (3), (4), and the Quantity Condition, it follows that ... (5) A_{i+1} is at least as good as A_i . (p. 308)

If the expression “satisfies the Quantity Condition” in (3) does not imply that its ceteris paribus clause is true, (5) does not obtain. What obtains is that (5)' other things being equal, A_{i+1} is at least as good as A_i . But (5)' is not sufficient, together with (10) A_1 is at least as good as B (or, for that matter, (10)' other things being equal, A_1 is at least as good as B), to derive a contradiction, and to deny the assumption that there is an axiology which satisfies all the adequacy conditions.

So I take the word “satisfies” in (3) to imply that the ceteris paribus clause is true. Then, even given the impossibility theorems, we can coherently accept all the adequacy conditions, for contradictions might come from the assumption that ceteris

paribus clauses can be true simultaneously. For example, suppose that “other things being equal” implies, among other things, that the cases are not those to which some other adequacy condition would apply (if such an adequacy condition did not contain this clause). Then, because all of the proofs concern the cases with which two or more adequacy conditions are involved, it turns out that they concern the cases where their ceteris paribus clauses cannot be true simultaneously. For example, in the above proof of the first axiological impossibility theorem, both the Quantity Condition and the Quality Condition⁸ are involved, so their ceteris paribus clauses cannot be simultaneously true.

The above specification of the ceteris paribus clause might be *ad hoc* and artificial, but the basic idea is more promising. Even given the proven impossibility theorems, by finding an axiological theory that makes the ceteris paribus clauses of adequacy conditions fail to be true simultaneously, we might be able to construct an axiology that make all the adequacy conditions true.

7 A Doubt about Argument for Separate Satisfiability

The proof of moral impossibility theorems in 12.4 and 12.7 (pp. 377-387) presupposes Separate Satisfiability: for any agent and any situation, there is an action that if the agent were to perform this action, then her action would not be morally wrong (p. 295). However, Arrhenius’ argument for the view seems to be wanting.

It is reasonable to claim, I think, that it should at least be logically possible for a person not to do the wrong thing. Normative theories which violate Separate Satisfiability by implying that there are situations in which all the available actions are wrong, or would be wrong were they performed, imply that there are situations where it is not even a logical possibility for an agent to do what the theory requires of her. (p. 295)

It is plausible that it should be “logically possible for a person not to do the wrong thing”, that is, a normative theory by and of itself should not entail that some particular person does a wrong thing. However, this is different from requiring a normative theory not to entail, even together with some description of a person and the situation, that he or she does a wrong thing.⁹ That latter idea is stronger and controversial. For example, certain theories entail, given that a guy has promised to legally marry to two girls (where

law does not allow bigamy), he does a wrong thing whoever he marries, but this might not be unreasonable.

IV. Questions about the possibility of satisfying the deflated principles

8 A Modified Version of Critical Level Utilitarianism

Critical Level Utilitarianism (*CLU*) is a modified Total Utilitarianism, a version of which John Broome espouses (Broome 2004). *CLU* holds that the more contributive value there is, the better it is, and the well-being of the affected individuals determine the amount of contributive value. However, unlike Total Utilitarianism, it takes the contributive value of an individual's life to be not her welfare u_i , but u_i minus a positive critical level k .

$$CLU(X) = \sum_{i=1}^n (u_i - k) \quad (n > 0)$$

$$0 \quad (n = 0) \quad (\text{p. 106})$$

As Arrhenius points out, *CLU* faces a serious problem.

As Broome writes, "...the neutral level for existence [the critical level] is positive, once the zero of lifetime wellbeing is normalized at the level of a constantly neutral life". Hence, since the critical level is positive, the contributive value of lives with positive welfare below the critical level is negative." (p. 106)

This feature of *CLU* leads to the violation of the No-Sadism condition (see section 1) and the Extended Egalitarian Principle (pp. 106-111).

The Extended Egalitarian Principle: If population A is a perfectly equal population of greater size than population B, and every person in A has higher positive welfare than every person in B, then A is better than B, other things being equal.

Considering this, why don't we make the contributive value of lives in the range between the neutral level and the critical level k not negative, but 0? That is:

$$CLU'(X) = \sum_{i=1}^n c_i \quad (n > 0)$$

$$0 \quad (n = 0)$$

$$c_i \text{ (contributive value of } u_i) = \begin{cases} u_i - k & (u_i > k > 0) \\ 0 & (0 \leq u_i \leq k) \\ u_i & (u_i < 0) \end{cases}$$



c_i when $k = 3$

CLU' not only avoids the Repugnant Conclusion^{1 1} and satisfies the Weak Quality Addition Condition (as *CLU* does (see p. 106f)) but also satisfies the No-Sadism Condition, because, unlike *CLU*, an addition of a population with positive welfare below the critical level k is not negative, but merely of zero value. It does violate the Extended Egalitarian Principle in the cases where population A is a perfectly equal population of greater size than population B, and every person in A has higher positive welfare than every person in B, but the welfare level of A and that of B both belong to the range between 0 and the critical level k . However, it at least satisfies the following weakened principle:

The Weaker Extended Egalitarian Dominance Principle: If population A is a perfectly equal population of greater size than population B, and every person in A has higher positive welfare than every person in B, then A is at least as good as B, other things being equal.

Doesn't this result sufficiently respect our intuitions?^{1 2} And if Incomplete and Vague Critical Level Utilitarianism are problematic because, as Arrhenius alleges, it introduces incompleteness or vagueness improperly (pp. 113-117), why not go for *CLU'*, which does not (necessarily) involve incompleteness or vagueness?

V. Questions about the implication and significance of the Impossibility Theorems

9 An Advantage of the Non-consequentialist Theories that Deny Positive Duties

Arrhenius says, “These [impossibility] theorems are a problem for any moral theory, consequentialist and non-consequentialist alike.” (p. 388; the word in the bracket added) I doubt this claim as for certain non-consequentialist theories. Many non-consequentialist theories with libertarian bent (e.g. Nozick 1973) deny positive duties, that is, duties to promote welfare. They take promoting welfare (of others) or making levels of well-being equal to be charitable, but not to be obligatory. These theories would not accept the deontic or moral versions of the normative adequacy conditions, because they would not take it to be wrong to fail to promote welfare (or to make levels of well-being equal). For example, they would not accept the Normative Egalitarian Dominance Condition (put up below once again), which is used in all the presented proofs in Chapter 12: Population Morality.

The Normative Egalitarian Dominance Condition (exact formulation): For any choice situation C , and any welfare level \mathbf{W}_x , **if** $A \subset \mathbf{W}_x$, all members of B have welfare below \mathbf{W}_x , $N(A)=N(B)$, $A(A) \subset C$, and $A(B) \subset C$, **then** all actions in $A(B)$ are wrong, other things being equal. (p. 378)

Further, being deontological theories, they can avoid any axiological principles that lead to axiological impossibilities. Then, don't they fare better than other normative theories that accept these adequacy conditions and hence involve contradictions (according to Arrhenius)?

Arrhenius might well deny the overall intuitiveness of such non-consequentialist theories, which will imply that we have no obligation to help the needy even if they are critically ill and we can save them with little cost. But this is an intuition that many supporters of such non-consequentialism do not share. And even granting the correctness of the intuition, isn't it at least a virtue of these theories if they can avoid certain incoherencies where other theories fail to do so?

10 The Evaluation of the Impossibility Theorems and the Status of Intuitions

Arrhenius seems to think that we should be very concerned about the Impossibility Theorems, because they indicate the inconsistency of our considered intuitions and

suggest that no axiological or moral theory can be justified^{1 3}. Here is his comment on the role of intuitions in the justification of a moral theory:

Appeal to considered intuitions is part of the core of the methodology of the dominant tradition in modern moral philosophy. A necessary but presumably not sufficient condition for a moral theory to be justified is that, apart from being internally consistent, it should be consistent with considered moral intuitions. (p.4)

This view is too strong, not only to be true but also to be a description of the standard methodology of normative ethics. Consistency with all considered intuitions is not necessary for the justification of an axiological or moral theory. Contemporary philosophers who take moral intuitions to be evidential (e.g. Huemer 2005, Ch. 5), or who accept the methodology of reflective equilibrium (e.g. Rawls 1971), usually hold that even considered moral intuitions are fallible. If some of them can be mistaken, it is not reasonable to require that an axiological or moral theory be consistent with all these considered intuitions. If an axiological or moral theory can be inconsistent with some considered intuitions and be still justified, we might not have to worry so much about the Impossibility Theorems. For example, suppose that, as Arrhenius argues, Total Utilitarianism “is one of the few theories that survives confrontation with adequacy conditions” other than the Weak Quality Addition Condition (p. 393). Because considered moral intuitions behind the Weak Quality Addition Condition can be mistaken, Total Utilitarianism can still be justified^{1 4}. Pace Arrhenius, we do not need intuitions-debunking arguments (pp. 392-394) to be justified in believing an axiological or moral theory together with the Impossibility Theorems.

I have presented several misgivings about Arrhenius’ *Population Ethics*. However, these comments should not discourage anyone from reading the masterpiece. We should thank Arrhenius for teaching us so much about population ethics, and try to see further by standing on his shoulders.

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¹ One notable exception is sufficientarianism or utilitarianism with a floor, which implies giving priority to people whose well-being is below a certain threshold level (Hirose 2015, Ch. 5). While this position is not proposed as a solution to problems in population ethics, neither do other distributive theories, such as egalitarianism and prioritarianism, which are discussed in Chapter 7 of Arrhenius' work. Because some experimental studies suggest that utilitarianism with a floor is popular (e.g. Gaertner and Schokkaert 2012, Chapter 3), its implications in population ethics might be worth investigating.

² All the page references are to this work except when otherwise noted.

³ In relation to this issue, Arrhenius says:

When in doubt over the truth of a condition, try to replace it with a logically weaker and intuitively more compelling condition.

That is what we did in the second theorem in which we replaced the Dominance Addition Condition with the Normative Non-Sadism Condition and the Normative Non-Extreme Priority Condition. As with the Normative Egalitarian Dominance Condition, it is hard to imagine any alternatives in a choice situation that would make us doubt the truth of these conditions. (p. 388)

However, the Normative Non-Sadism Condition and the Normative Non-Extreme Priority Condition are stronger in a respect than the (Normative) Dominance Addition Condition. The former conditions presuppose the existence of negative welfare level while the latter does not (see below). If you doubt the tenability of positive/negative polarity in welfare, you will doubt former adequacy conditions. Let me add that similar comments apply to the pair of the Quality Addition Condition and the Weak Quality Addition Condition: the latter is not strictly weaker than the former because the latter condition presupposes the existence of negative welfare level while the former does not.

The Normative Non-Sadism Condition (exact formulation): For any choice situation C , and for any population C , **if** $A \subset W_x$, $x > 0$, $B \subset W_y$, $y < 0$, $N(B) > 0$, $A(AUC) \subset C$, $A(BUC) \subset C$, and all actions in $A(AUC)$ are wrong, **then** all actions in $A(BUC)$ are wrong, other things being equal. (p. 382, an underline added; the underlined part means that a population B has negative welfare)

The Normative Non-Extreme Priority Condition (exact formulation): There are two welfare levels W_x and W_y , and a welfare range $R(1, z)$, $x > z$, $y < 0$, and a number of lives n such that, for any choice situation C , **if** $A \subset W_u$, $u \geq x$, $N(A) = n$, $B \subset R(1, z)$, $N(B) = n + 1$, $C \subset W_y$, $N(C) = 1$, $D \subset L$, $A(AUCUD) \subset C$, $A(BUD) \subset C$, and all actions in $A(AUCUD)$ are wrong, **then** all actions in $A(BUD)$ are wrong, other things being equal. (p. 383, underlines added; the underlined parts together mean that a population C has negative welfare)

The Normative Dominance Addition Condition (exact formulation): For any choice situation C , and any pair of welfare levels W_x and W_y , $y > 0$, **if** all the lives in A have welfare below W_x , all the lives in B have welfare above or at W_x , $N(A) = N(B)$, $C \subset W_y$, $A(A) \subset C$,

$A(BUC) \subset C$, and all actions in $A(BUC)$ are wrong, **then** all actions in $A(A)$ are wrong, other things being equal. (p. 379)

The Quality Addition Condition: For any population X, there is a perfectly equal population with very high welfare such that its addition to X is at least as good as an addition of any population with very low positive welfare to X, other things being equal. (pp. 84-85)

The Weak Quality Addition Condition: For any population X, there is a perfectly equal population with very high positive welfare, and a very negative welfare level, and a number of lives at this level, such that the addition of the high welfare population to X is at least as good as the addition of any population consisting of the lives with negative welfare and any number of lives with very low positive welfare to X, other things being equal. (p. 86, underlines added)

⁴ Given hedonism it is more natural to hold that there are negative components and levels of well-being than given other theories, such as desire-satisfaction theory, capabilities theories, life-satisfaction theory etc. On p. 29, Arrhenius says that desire theorists take frustrated desires to be bad for a person, but traditional desire or preference theories, both in philosophy and in economics, do not contain this theory of badness for a person (see, for example, Hare 1981 and Sen 1970). This point is one reason to doubt his claim that “[i]n general, the nature of the problems we shall discuss is not dependent on any specific theory of welfare (in the above sense).” (p. 16)

Note also that even if welfare components like episodes of pain can be negative in some absolute terms, it does not follow that the welfare levels of lives can be negative. For example, according to the usual representation of QALY (Quality Adjusted Life Years), though unhealthiness reduces well-being (and is thus a negative component), the value of lives can never be reduced to be lower than 0.

⁵ Moore’s “principle of organic unities” holds that the value of a whole need not equal the sum of the values its parts would have by themselves (Moore 1903, section 18).

⁶ For example, I am not sure whether the above Normative Egalitarian Dominance Condition obtains. Although Arrhenius argues for this condition that “it is hard to see any reason for why it should be optional to choose B in the cases that falls under the condition’s domain” (p. 374), there might be a good reason: respect for the agent’s freedom. Deontologists tend to find such a feature of their theories an advantage over consequentialist rivals (Alexander and Moore 2012, section 3).

⁷ As far as the value of states of affairs is independent of what we know, axiological adequacy conditions need no addition of similar epistemic element.

⁸ *The Quality Condition (exact formulation)*: There are two positive welfare ranges $\mathbf{R}(u, v)$ and $\mathbf{R}(1, y)$, $u > y$, and a population size $n > 0$, such that if $\mathbf{W}_z \subset \mathbf{R}(u, v)$, $A \subset \mathbf{W}_z$, $N(A) = n$, and $B \subset \mathbf{R}(1, y)$, then A is at least as good as B, other things being equal.

⁹ Thomas Nagel says: “But it is not in itself a contradiction to say that someone can do X not do X, and that for him to take either course would be wrong. It merely contradicts the supposition that *ought* implies *can*—since presumably one ought to refrain from what is wrong, in such a case it is impossible to do so. Given the limitations on human action, it is naïve to suppose that there is a solution to every moral question with which the world can face us. We have always known that the world is a bad place. It appears that it may be an evil place as well.” (Nagel 1979, p. 74)

¹⁰ I remember that in conversation Arrhenius suggested that Gregory S. Kavka held this position, but I do not find *CLU'* in his paper (Kavka 1982).

¹¹ Derek Parfit introduced the idea of the Repugnant Conclusion as follows: “For any possible population of at least ten billion people, all with a very high quality of life, there must be some much larger imaginable population whose existence, if other things are equal, would be better, even though its members have lives that are barely worth living.” (Parfit 1984, p. 388). In order for *CLU* and *CLU'* to avoid the Repugnant Conclusion, the critical level k must be set higher than very low positive welfare (p. 106).

¹² *CLU'* also violates another condition listed by Arrhenius, which is the Non-Anti Egalitarian Principle:

A population with perfect equality is better than a population with the same number of people, inequality, and lower average (and thus lower total) welfare.

CLU' violates this principle when the two populations belong to the range between 0 and the critical level k : they are as good (or as bad) as each other. As you might well expect, *CLU'* satisfies the following weakened principle.

The Weaker Non-Anti Egalitarian Principle: A population with perfect equality is at least as good as a population with the same number of people, inequality, and lower average (and thus lower total) welfare.

Once again, doesn't this result sufficiently respect our intuitions?

^{1 3} Arrhenius' work is very theory-oriented. He first formulates several general conditions of adequacy for axiological and moral theories, and presents proof that no axiological or moral theory can satisfy them simultaneously. Anti-theorists (e.g. Williams 1985) and particularists (e.g. Dancy 2004) might argue that the impossibility theorems just show their view is correct: there is no correct normative theory or generalization even though there are context-dependent or particular normative truths.

^{1 4} Given the results of section eight, you might rather argue that *CLU'* is justified, accepting the Weak Quality Addition Condition but revising the Normative Egalitarian Dominance Condition and the Non-Anti Egalitarian Principle.