INFINITE UTILITY: COUNTERPARTS AND ULTIMATE LOCATIONS

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Abstract. The locations problem in infinite ethics concerns the relative moral status of different categories of potential bearers of value, the primary examples of which are people and points in time. The challenge is to determine which category of value bearers are of ultimate moral significance: the ultimate locations, for short. This paper defends the view that the ultimate locations are people at times. A person at a time is not a specific person, but the person born at a specific point in time (de dicto). The main conclusion of the paper is that the unsettling implications of the time- and person-centered approaches to infinite ethics can be avoided. Most notably, a broad class of worlds that person-centered views deem incomparable can be strictly ranked.

1. The locations problem

The locations problem in infinite ethics concerns the moral status of people relative to points in time, states of nature, and other categories of potential bearers of value. The challenge is to determine which category of value bearers are of ultimate moral significance: the ultimate locations, for short.\footnote{Following Broome (1991), the literature on infinite ethics frequently refers to potential value bearers as locations. The term ‘ultimate locations’ was introduced by Vallentyne and Kagan (1997) following the realization that the prescriptions of finitely additive infinite value theories typically depend on which locations are referenced. I use the term as short hand for ‘the locations referenced by the most plausible finitely additive infinite value theory’.} I will deal with two aspects of this challenge. The first concerns over which locations (i.e., bearers of value) the Pareto axiom is most appropriately defined. Given worlds $w_1$ and $w_2$ that have the same locations, this axiom says that $w_1$ is better than $w_2$ if some location has more utility in $w_1$ than in $w_2$, and no location has less utility in $w_1$. It turns out that the prescriptions of this axiom sometimes depend on which locations are referenced. We must then ask which locations should be referenced.\footnote{This question presumes that we insist on some instantiation of Pareto, despite the concerns that have raised about doing so (Van Liedekerke, 1995; Hamkins and Montero, 2000).}

The second aspect of the challenge concerns the notion of a locational order. In many of the proposed extensions of utilitarianism to infinite worlds, the temporal (or spatio-temporal) order crucially determines the order of summation. These proposals include the PMU criterion of Vallentyne (1993), Wilkinson’s (2021) spatio-temporal version of expansionism, and almost all contributions to the economics literature stemming from the seminal work of Ramsey (1928). While points in time arguably possess a natural order, there is near consensus that individuals cannot be ordered in a natural way. For utilitarians, the second aspect of the challenge might thus be cast as that of deciding whether or not the relevant utilities should be summed in a particular order.

Key words and phrases. infinite utility; counterpart relations; locations of value; non-identity.
Some utilitarians see people as containers for well-being. On this view, what matters is not people, but rather the intensity and duration of subjective experiences. Other authors, including Peter Vallentyne, John Broome, Nick Bostrom and Amanda Askell, take the opposite viewpoint. As Vallentyne writes, ‘the spirit of traditional utilitarianism goes with the person-centered approach rather than the time-centered approach’. Finally, some authors remain neutral as to whether the ultimate locations are people, points in time, or something else. For example, neither Lauwers and Vallentyne (2004) nor Arntzenius (2014) take a stance on what the ultimate locations are.

It has long been known that, in infinite worlds, it makes a crucial difference which locations are referenced. As Cain (1995) demonstrates (and as I illustrate below), Pareto over times conflicts with Pareto over persons. If we insist that people are important, as many people do, the time-centered approach thus seems untenable.

The person-centered approach has a clear moral basis. However, as Askell (2018) shows and as we will later see, person-centeredness leads to generic incomparability: ‘most’ pairs of infinite worlds cannot be ranked. One might react to this result by concluding that infinite ethics is fundamentally undecidable. But we might also ask if it is possible to place significance on people in such a way that generic incomparability is not entailed.

In this paper, I defend the view that the ultimate locations are people at times. Informally, a person at a time is not a specific person, but the person born at some specific point in time (de dicto). In §3, I give a formal definition of people at times using a counterpart relation that identifies individuals born at the same time in different futures. I show that, under certain assumptions (stated in §3), this counterpart relation can be deduced from Parfit’s (1984) No Difference View. In §4–5, I explore the implications of taking people at times as the locations. My conclusion from this investigation is that the unsettling implications of the time- and person-centered approaches can be avoided. Most notably, a broad class of infinite worlds that person-centered views deem incomparable can be strictly ranked.

2. Against times and people as ultimate locations

I begin by recalling the primary criticisms of the time- and person-centered approaches to infinite ethics. I return to these criticisms in §4.

2.1. Against times. The most influential critique of time-centeredness is due to Cain (1995). The following is a version of one of his thought experiments.\(^5\)

**Ordeal.** At times \(t = 1, 2, 3, \ldots\), a person is born and lives for two equally long periods. Each person’s life is an ordeal where utility is negative in the first period and positive in the second period. As a whole, each person has a life well worth living. Table 1 displays the utility profile of an infinite world that obtains in this way. I will refer to this world as **Ordeal.**

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\(^3\)See Vallentyne (1995: 417). Bostrom (2011: 19) and Askell (2018: 14) make similar remarks. Broome (2006: Ch. 7) addresses a version of the locations problem in finite worlds. He rejects the time-based (or ‘snap-shot’) view in favor of the person-centered view.

\(^4\)I will consider three types of locations: times, people, and what I refer to as people at times. §2.1 and §4.1 illustrate the fact, due to Cain (1995), that Pareto over times conflicts with Pareto over people. We will also see that Pareto over people at times conflicts with both Pareto over times (§4.1) and Pareto over people (§6.3).

\(^5\)See Cain (1995: 401).
In each time period, realized utility is negative. So, summing over times would lead us to conclude that Ordeal is worse than the world where each person has zero utility, at all times. But intuition suggests that a world in which all lives are well worth living is better than a world in which everyone has utility 0. Many authors (myself included) have found this objection to time-centeredness to be decisive.

2.2. Against people. One criticism of person-centered approaches says that such approaches are inadequate in cases involving future people. The following thought experiment from Parfit (1984: 361) is a well known illustration of this point.

**Depletion.** As a society, we must choose between conservation and depletion of a natural resource. If we choose to deplete the resource, then the quality of life over the next few centuries will be slightly higher than what it would be if we had chosen to conserve the resource. However, if we choose depletion, then the quality of life will later, and then for many centuries, be much lower than what it would have been had we chosen conservation.

As Parfit (1984: 361) argues, we can plausibly assume that, after one or two centuries, there will be no one in our society who would have been born whichever policy we choose. Depleting the resource is therefore not bad for any one specific person. In fact, there is a person-centered argument for depleting the resource: if we do, then some individuals (those now living and those about to be born) will be better off, and no-one will be worse off. Thus, at least some person-centered views seem to suggest that depletion is permissible. This problem (for these views) persists in the twist to Depletion that we obtain by replacing ‘for many centuries’ above with ‘for eternity’. We will see (in §4.2) that in the case of an infinite time horizon, Depletion challenges a broader class of person-centered views. Indeed, the person-centered principles that the literature on infinite ethics provides cannot compare the outcome of choosing depletion with that of choosing conservation.

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6To be sure, not all person-centered views deny that depletion is worse than conservation (cf. Meacham (2012)). However, depletion is permissible on any view that meets the person-affecting restriction which states that a favored outcome must be favored by at least one individual. This restriction has received some heavy criticism, but it is not without proponents—see and compare Heyd (2009) and Temkin (1993) and Arrhenius (2009). For discussion, see Roberts (2019).
3. People at times

The concept of people at times will allow us to avoid the aforementioned criticisms of time- and person-centeredness. I will present this concept in a setting which is slightly more general than that of Fleurbaey and Michel (2003), but it will here be assumed that only one person is born at the start of each period.7 This assumption will make the key difference between person-centeredness and people-at-times-centeredness easy to flesh out, and it will still permit us to deal with many problem cases that have been frequently discussed.

Unless stated otherwise, I assume the following: At time $t_1$, a single person comes into existence, lives for $l_1$ units of time and then dies. A new person comes into existence at time $t_2 > t_1$, lives for $l_2$ units of time and then dies. And so on, without end.8 By a future, I mean a sequence $w = ((u_1, p_1), (u_2, p_2), (u_3, p_3), \ldots)$, where $u_i$ is the lifetime utility of $p_i$, the person born at time $t_i$. I will primarily be interested in the problem of how utilitarianism should rank infinite futures.

In philosophy, this problem was first discovered by Segerberg (1976). It was rediscovered by Nelson (1991), and a solution was proposed by Vallentyne (1993). Beginning with Ramsey’s (1928) work on capital accumulation, the problem has also been studied from the viewpoint of intertemporal social choice, particularly in welfare economics and environmental economics.9 My primary aim in this paper is to contribute to the long-standing debate in philosophy about which locations should be referenced. But the paper can also be interpreted as an attempt to provide a philosophical basis for the utility streams framework used in the literature on intergenerational equity. As Askell (2018: 12) points out, such a basis has not been provided even in the case when one person lives at each point in time.

Informally, a person at a time is not a specific person, but the person born at some specific point in time (de dicto). My first goal is to give a formal definition of this concept. My definition uses a counterpart relation induced by Parfit’s (1984) No Difference View (NDV). Before I define people at times, I therefore need to recall what NDV says and explain its relevance to the problem at hand.

NDV is Parfit’s response to forward-looking implications of the non-identity effect in cases like Depletion. The non-identity effect is the indirect or random effect that acts performed today have on the genetic makeup (and therefore the identities) of future people. As already mentioned, Parfit (1984: 361) argues that the selection of social or environmental policies provide examples of identity-affecting acts. It is widely believed that a much wider class of acts eventually affect which sperm-egg combinations become living beings a few centuries from now. For instance, Greaves (2016: 350) argues that this class includes acts as mundane as that of helping someone across the street.

Due to the non-identity effect, we can thus plausibly assume that any two futures eventually have no individuals in common. For expositional brevity, I will assume

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7Fleurbaey and Michel (2003: 799) use a setting where there is a constant (finite) number of people within each one of a sequence of non-overlapping time periods. In the special case when there is one person per period, their definition of a generation coincides with my informal definition of a person at a time.

8Most of the discussion in this paper concerns the case when $l_i = l_1$ and $t_i = i \cdot t_1$ for every $i$, but my arguments do not hang on these specifics. In Ordeal (see 2.1), $t_i = i$ and $l_i = 2$.

9See, e.g., von Weizsäcker (1965), Van Liedekerke and Lauwers (1997), Fleurbaey and Michel (2000), Basu and Mitra (2007), Roemer (2011), and Zuber and Asheim (2012).
that any two futures have no individuals in common at all. I explore the implications of relaxing this assumption in §6.3.

The No Difference View tells us to reason as if our acts were not identity-affecting. Mulgan (2002: 168) formulates NDV in the following way:

NDV (No Difference View). If we believe we are facing a same-people choice, and discover that it is actually a different-people choice, then this should make no difference to our moral deliberations.

This formulation of NDV could use a qualifier to clarify that the reason why we initially believed that we were facing a same-people case, but then ‘discovered’ that we actually have a different-people case, is that the choice itself is identity-affecting. With this qualifier, NDV might be expressed as follows.

If a forward-looking different-people case would have been a same-people case had it not been for the non-identity effect, then the moral ranking is the same as in a same-people case.

As Mulgan (2002: 168) notes, the No Difference View is a feature of most utilitarian accounts of our obligations to future people. As stated above, I am here interested in the problem of how utilitarianism should rank possible futures. NDV is therefore relevant to the problem at hand.

My next step is to observe that NDV induces a counterpart relation that identifies people born at the same time in different futures. To see this, consider two futures, 

\[(u_1, p_1), (u_2, p_2), (u_3, p_3), \ldots \] and 

\[(u'_1, p'_1), (u'_2, p'_2), (u'_3, p'_3), \ldots \].

If there were no non-identity effect, then \(p_t\) and \(p'_t\) would be the same individual. By NDV, we can therefore reason as if \(p_t\) and \(p'_t\) were the same individual. Let \(\sim_{NDV}\) denote the counterpart relation that identifies \(p_t\) and \(p'_t\).

Note that if we identify people born at the same time in different futures, it becomes convenient to associate a future with a sequence \((u_1, u_2, u_3, \ldots)\) of utilities. We then interpret \(u_i\) not as the lifetime utility of a specific person, but as the lifetime utility the person born at time \(t_i\) de dicto. This is one way of interpreting the utility streams framework used in the literature on intergenerational equity (Diamond, 1965; Fleurbaey and Michel, 2003; Lauwers, 2010).

I am now in a position to define the concept of a person at a time in the setting described at the beginning of this section, where single people come into existence at arbitrary, fixed times. The binary relation \(\sim_{NDV}\) is defined on the set of potential people. If \((u_1, p_1), (u_2, p_2), (u_3, p_3), \ldots\) and \((u'_1, p'_1), (u'_2, p'_2), (u'_3, p'_3), \ldots\) are possible futures, then \(\sim_{NDV}\) identifies \(p_t\) and \(p'_t\), for every \(t\). That is, \(p \sim_{NDV} p'\) if \(p'\) and \(p\) live at the same time in different futures. This binary relation is reflexive, symmetric and transitive (i.e., an equivalence relation). Its equivalence classes consist of people born at the same time in different futures. These equivalence classes provide a formal definition of the concept of people at times.

The rest of the paper explores the implications of letting people at times be the locations. During this investigation, I use their informal definition. Thus, if people at times are referenced, then

\[^{10}\text{Note that the meaning of a counterpart in the present discussion is different compared with the Counterpart Theory of David Lewis, where counterpart relations are similarity relations. In the present discussion, that } p' \text{ is a counterpart to } p \text{ means that it is not morally relevant to distinguish } p \text{ and } p'. \text{ This is not a claim to the effect that } p' \text{ is more similar to } p \text{ than to other objects in the world that } p \text{ inhabits. I return to this point in §6.1.}\]
‘the person born at time \( t \)’

is interpreted \( \textit{de dicto} \). In this case, the locations are the same across alternatives. When people are referenced, ‘the person born at time \( t \)’ is interpreted \( \textit{de re} \). We will see that the subtle difference between people and people at times not only leads to conflicting versions of Pareto. It also bears on the important question of whether the relevant locations come in a particular order.

4. **Ordeal and Depletion**

In §2, I touched on some criticisms of the time- and person-centered approaches to infinite ethics. In this section, I expand on these criticisms and show that the person-at-times-centered approach avoids them.

A note on terminology: In the literature of infinite ethics, a ‘person-centered’ view is one where people are referenced as the locations. In the context of conflicting versions of Pareto, person-centered views give priority to Pareto over people. It should be noted that person-centeredness does not imply any commitment to \( \textit{person-affecting} \) restrictions. In fact, person-centered views typically do not meet the restriction that a favored outcome must be favored by at least one individual.\(^{11}\)

With respect to person-affecting restrictions, there might thus appear to be little difference between person-centeredness and person-at-times-centeredness. We will see though that Pareto over people at times conflicts with Pareto over people (see §6.3). So, although the view that I defend does place significance on people, it does not qualify as a person-centered view.

4.1. **Ordeal: times vs people at times.** Recall from §2.1 that Ordeal is a world where single people come into existence at times \( t = 1, 2, 3, \ldots \) and live for two time periods of length one. The utility realized in each period is negative, but the lifetime utility of each person is positive—see Table 1. One version of the standard objection to time-centeredness points out that Pareto over times entails that Ordeal is worse than the world where everyone has utility \( 0 \).

From the person-centered viewpoint, Ordeal is \textit{better} than the world where everyone has utility \( 0 \). Indeed, in Ordeal, the person born at time \( t \) \( \textit{de re} \) has a life well worth living, for every \( t \). It is also true that, for every \( t \), the person born at time \( t \) \( \textit{de dicto} \) has a life well worth living. So the people-at-times-centered approach is not subject to the criticism that is often leveled at time-centeredness.

Ordeal illustrates the difference between time-centeredness and people-at-times-centeredness. The difference between person-centeredness and people-at-times-centeredness is here more subtle. To illustrate, consider the choice between

\( w \): Ordeal, or

\( w' \): a world where single people live at the same times as in Ordeal, but everyone has utility \( 0 \), at all times.

\(^{11}\)Consider, for example, the view that the sum of individual utilities should determine the ranking of all infinite worlds for which the relevant sums are well defined and absolutely convergent. This view is person-centered, but does not meet the person-affecting restriction (see footnote 6).
If \( w \) and \( w' \) contain the exact same individuals,\(^{12}\) then \( w \) is better than \( w' \) by Pareto over people. If, however, the choice is identity-affecting, then Pareto over people is silent, because in this case the individuals in \( w \) and \( w' \) are not the same. In this case, \( w \) is better than \( w' \) by Pareto over people at times. Indeed, the person born at time \( t \) de dicto has more utility in \( w \) than in \( w' \), for every \( t \).

4.2. Depletion: people vs people at times. I now return to the twist to the Depletion case where depleting the resource increases the quality of life for a few centuries, but then reduces it significantly for all eternity (see §2.2). I will first show that people-at-times-centeredness leads to the conclusion that conservation is better than depletion. I then explain why person-centeredness leads to incomparability.

It should be pointed out that although incomparability is consistent with Askell’s (2018) conclusion that most pairs of infinite worlds cannot be ranked, the inability of person-centeredness to give a verdict in cases like Depletion is not widely recognized. Askell (2018) considers cases where locational order plays a crucial role. (I discuss such cases in the next section.) That person-centeredness does not even allow us to deal with cases like Depletion is not well recognized in the literature on infinite ethics.

Let us assume, for simplicity, that there is one person per period (say eighty years), and that everyone in the conservation world, \( w_C \), has utility 2. In the depletion world, \( w_D \), the people in the first two periods have utility 3 and the rest have utility 1. In other words, the utility sequences that go with \( w_C \) and \( w_D \) are as follows:

\[
\begin{align*}
w_C &: (2, 2, 2, 2, 2, 2, 2, \ldots) \\
w_D &: (3, 3, 1, 1, 1, 1, 1, \ldots).
\end{align*}
\]

As in the original version of Depletion (where the time horizon is finite), the two worlds eventually have no individuals in common.

With people at times as the locations, we can rank \( w_C \) and \( w_D \) using principles that enjoy relatively wide support. For instance, the following principle entails that \( w_C \) is better than \( w_D \).

\( \text{SBI1.} \) For worlds \( w_1 \) and \( w_2 \) that have the same locations, if there are constants \( c_1 \) and \( c_2 \) with \( c_1 > c_2 \) such that the utility of every location in \( w_1 \) is greater than \( c_1 \) and the utility of the same location in \( w_2 \) is less than \( c_2 \), except possibly for finitely many locations, then \( w_1 \) is better than \( w_2 \).

This is Vallentyne and Kagan’s (1997: 11) first strengthening of their Basic Idea. Its person-centered instantiation is silent here, because the people in \( w_C \) and \( w_D \) are not the same. By contrast, if people at times are the locations, then the locations are the same. For every \( t > 2 \), the utility of the person born at time \( t \) de dicto is equal to 2 in \( w_C \), but 1 in \( w_D \). So the people-at-times-centered version of SBI1 says that \( w_C \) is better than \( w_D \).

\(^{12}\)Some philosophers (notably Lewis (1968)) deny that it is ever meaningful to speak of objects in different worlds as being the same. On this view, a counterpart relation can serve as a substitute for transworld identity. Readers who sympathize with this view may interpret my saying that two individuals are the same to mean that they are counterparts in the least controversial sense possible. For an uncontroversial case, the reader is asked to think of a single-person world where the reader has coffee, and another single-person world where the reader has tea.
As I mentioned in §2, the person-centered principles that the literature provides are unable to compare \( w_C \) and \( w_D \). This includes the person-centered principles of Vallentyne and Kagan (1997) and Lauwers and Vallentyne (2004)\(^{13}\) and Arntzenius’ (2014: 55) Weak People Criterion.\(^{14}\) The basic problem for person-centeredness in cases like Depletion is that, without sameness of locations, the mere fact that the individual (or location-wise) utility level is higher in one infinite world than in another does not say much about if and how the worlds should be ranked.

For readers unfamiliar with the pitfalls of infinite ethics, the last claim may need explanation. To clarify, consider two worlds, \( w_1 \) and \( w_2 \), populated by infinitely many individuals, not necessarily future people. The individuals in \( w_1 \) have utility 1 while those in \( w_2 \) have utility 2. If \( w_1 \) and \( w_2 \) contain the same individuals, then \( w_2 \) is better than \( w_1 \) by Pareto over people.\(^{15}\) However, in some cases it is implausible that \( w_2 \) is better than \( w_1 \). As Vallentyne (1995) notes, one problem is that \( w_1 \) may contain all locations from \( w_2 \), plus a hundred clones of each. On these grounds, he concludes that traditional utilitarianism should not, in general, judge a world with a higher individual utility to be better than a world with a lower individual utility.\(^{16}\) For another reason to take this position, consider a future world where each generation consists of one billion people that each have utility 2, and a second world where each generation consists of ten people, each with utility 2.1. Then the individual utility level is higher in the second world. Yet from the perspective of total utilitarianism, it seems highly doubtful that the second world is better.

It is of course possible to define person-centered principles that do rank \( w_C \) above \( w_D \). For example, anyone is free to declare one world to be better than another if the individual utility level is higher in the first world, except possibly for finitely many individuals. But, as we have just noted, such a principle becomes implausible when we consider infinite worlds whose populations are not the same. We might restrict it in such a way that it applies in Depletion, but is silent in other different-people cases. However, in doing so we will need to explain what distinguishes Depletion from other different-people cases. It seems that such explanations will ultimately have to appeal to the fact that Depletion involves people whose existence is contingent on our acts. We must then concede that non-identity cases can be dealt with as same-people cases, which is precisely what NDV asserts. And as we have seen, NDV leads us away from person-centeredness towards the impersonal concept of people at times.

\(^{13}\) Vallentyne and Kagan’s (1997) principles cover two types of cases, one where locations are the same and one where locations have a natural order. Their first set of principles do not apply in Depletion with people as the locations, because the people in \( w_C \) and \( w_D \) are not the same. Their second class of principles do not apply since (they argue) people come in no particular order. Lauwers and Vallentyne’s (2004) principles are silent in Depletion for the same reasons.

\(^{14}\) See footnote 17 and the discussion preceding it.

\(^{15}\) If \( w_1 \) and \( w_2 \) contained the same finite number of people, we would not need sameness or a counterpart relation to make plausible that \( w_2 \) is better than \( w_1 \); in this case, Suppes dominance says that \( w_2 \) is better since there is a one-one correspondence between the populations of \( w_1 \) and \( w_2 \) such that at least one person in \( w_2 \) is better off than the corresponding person in \( w_1 \), and every person in \( w_2 \) is at least as well off as the corresponding person in \( w_1 \) (cf. Broome, 2018: 233). We are about to see that, unless the one-one correspondence in question is a plausible counterpart relation, this notion of dominance becomes implausible in infinite worlds.

\(^{16}\) See Vallentyne (1995: 419). The same reasoning leads Vallentyne and Kagan (1997: 20) to reject the idea that infinite worlds with a higher individual utility are in general better than worlds with a lower individual utility.
Finally, let us note that the inability of person-centered principles to deal with the Depletion case is not cured by identifying non-existence and existence with utility 0. For suppose we do. We must then compare

world $w'_C$, where infinitely many individuals have utility 0 (those with utility 1 in $w_D$) and the infinitely many remaining individuals have utility 2, and

world $w'_D$, where two individuals have utility 3, infinitely many have utility 0, and the infinitely many remaining individuals have utility 1.

By assumption, these worlds contain the same individuals. But since infinitely many of them have more utility in $w'_C$, while infinitely many have more utility in $w'_D$, this does not help (SBI1 is silent). Neither does the fact that the sum of individual utility differences may approach plus infinity or minus infinity depending on how these differences are ordered.\(^{17}\) We could get a verdict by placing significance on the individual’s temporal positions. However, as mentioned in the introduction, doing so has generally been considered morally unjustified. I return to this aspect of the problem in the next section.

5. INCOMPARABILITY VS LOCATIONAL ORDER

So far, I have focused on different versions of Pareto. Another much debated aspect of the problem at hand concerns the idea of a locational order. The sticking point is that many of the principles for ranking infinite worlds that the literature provides are sensitive to the order in which utilities appear.\(^{18}\) In this section, I will first describe the main objection to these principles. I then explain why the objection is not relevant when the locations are people at times.

The following case has generated a considerable amount of attention.\(^{19}\)

**Cycles.** In two future worlds, $w_1$ and $w_2$, single people live in non-overlapping time periods (say 80 years). The living conditions in each period are either good, corresponding to utility 2, or bad, corresponding to utility 1. In $w_1$, two good periods are followed by a bad period, which is followed by two good periods, and so on. The periods that are good in $w_1$ are bad in $w_2$, and vice versa. Thus, the utility profiles of $w_1$ and $w_2$ are as follows:

$$w_1 : (2, 2, 1, 2, 2, 1, 2, 2, 1, 2, 2, 1, \ldots)$$

$$w_2 : (1, 1, 1, 2, 1, 1, 1, 2, 1, 1, 1, 2, \ldots).$$

As before, $w_1$ and $w_2$ have no individuals in common.

\(^{17}\)This is why Arntzenius’ (2014: 55) Weak People Criterion (WPC) does not give a verdict. Askell (2018: 160) formalizes WPC using the following notation: Given worlds $w$ and $w'$, let $P$ be the set of people that are in either $w$ or $w'$. If $p \in P$ exists in $w$, let $u_w(p)$ denote $p$’s utility in $w$; if not, then $u_w(p) = 0$. WPC says that $w$ is better than $w'$ if and only if $\sum_{i=1}^{n}(u_w(p_i) - u_{w'}(p_i))$ tends to a positive real number, or plus infinity, for every enumeration $p_1, p_2, p_3, \ldots$ of $P$. To see that WPC does not rank $w_C$ above $w_D$, note that $\sum_{i=1}^{n}(u_w(p_i) - u_{w_D}(p_i))$ tends to minus infinity if we enumerate $P$ so that $p_1$ is in $w_C$ if and only if $i$ is, say, an integer multiple of 10.

\(^{18}\)These proposals include the *medial limit* of Van Liedekerke and Lauwers (1997), the ordersensitive principles of Vallentyne and Kagan (1997) and Bostrom’s (2011) *value density*.

\(^{19}\)The case considered in this section first appears in Segerberg (1976: 235). It has reappeared many times in different forms, but not all authors are explicit about whether or not people are the same across alternatives. Askell (2018) explicitly assumes that people differ across alternatives. Indeed, the case considered here is identical to her Mansion and Shack (Askell, 2018: 9).
Our first reaction is perhaps that \( w_1 \) is better than \( w_2 \) since \( w_1 \) has more utility in every sufficiently large time interval. As appealing as this intuition may seem, it presumes a locational order. Once again, we must ask which locations should be referenced; in this case, what matters most is if they come in a particular order.

Points in time have generally been considered to possess a natural order. So, with times as the locations, we can compare \( w_1 \) and \( w_2 \) using principles that are sensitivity to the order in which utilities appear. However, in the post-Cain (1995) era of infinite ethics, most authors deny that times are ultimate locations. There is a clear moral basis for taking people as the locations, but then there is no natural order. As Bostrom (2011: 19) points out, since people come in no particular order, it is unclear if worlds like \( w_1 \) and \( w_2 \) can be strictly ranked. Askell (2018) further develops this position. She defends the view that people are the ultimate locations and argues that worlds like \( w_1 \) and \( w_2 \) are incomparable (i.e., that they cannot be strictly ranked, but are not equally good).

Summing up, in order to avoid incomparability in Cycles, it seems we must appeal to a locational order. The objection from person-centeredness says that we should place significance on people, and people come in no particular order. This objection is difficult to deny, but it does not apply to people at times. As an illustration, consider the statement

\[
\text{the person born at time } t \text{ could be born at some other time } t'.
\]

This statement makes perfect sense if ‘the person born at time \( t' \)’ is interpreted \textit{de re}. On the \textit{de dicto} reading, the statement is internally inconsistent. Likewise, although it is arguably true that people come in no particular order, this is not so for people at times. Consequently, the objection to the order-sensitive principles that the literature provides does not apply if the locations are people at times. If these principles are applied with people at times as the locations, then worlds like \( w_1 \) and \( w_2 \) can be strictly ranked.

6. Objections

I have argued that person-at-times-centeredness avoids the standard criticism of time-centeredness and yields plausible prescriptions where person-centeredness leads to incomparability. In this section, I tie up some loose ends by answering three objections.

6.1. First objection. Inspired by the literature on intergenerational equity, I have used a framework where individuals come into existence at fixed times. The first objection is that we can easily find problem cases that the framework does not accommodate.

\[\text{For a lucid description of Askell's (2018) argument, see Wilkinson (2021: 1926-27).}\]

\[\text{Wilkinson (2021) avoids incomparability by taking points in time as the locations. As he acknowledges, this proposal remains susceptible to the standard criticism of time-centeredness (see §2.1 and 4.1). Another way to avoid incomparability in Cycles would be to declare worlds like } w_1 \text{ and } w_2 \text{ equally good, a conclusion which has also been described as unsettling (see, e.g., Segerberg (1976: 235), Van Liedekerke and Lauwers (1997: 164), and Wilkinson (2021: 1928)).}\]

\[\text{The correctness of the statement depends, among other things, on our conception of personal identity. Indeed, the statement is inconsistent with Parfit's (1984: 351) Time Dependence Claim.}\]

\[\text{One might object that, while it is true that people at times come in a particular order, it is specific people that matter, and people can appear in any order. In §6.3 we will see that there is an air of contradiction about this argument.}\]
Besides reasons of space, the main reason why I have focused on idealized cases is that this is often an effective way to attack difficult questions. A central question in infinite ethics concerns if and how generic incomparability can be avoided. Person-centeredness leads to incomparability in idealized cases, so it makes sense to deal with such cases first. We have seen how incomparability can be avoided in the kind of idealized cases that have been most frequently discussed. Given this, it would be unsurprising if incomparability can be avoided in other, more complicated cases. It would, for example, be unsurprising if incomparability can be avoided in Depletion if people are born one second earlier in one outcome, or if two people are born at the start of each period (in both outcomes). Such cases call for a more fluid concept of people at times. But that will be a topic for another time.

6.2. Second objection. As already noted (in §3), the role that counterpart relations play in the present theory is different compared with David Lewis’ Counterpart Theory (CT), where counterpart relations are similarity relations. Lewis uses counterpart relations to clarify the meaning of de re modal statements about specific objects. For example, in CT, to claim that ‘I could have been a historian’ is to claim that there is a possible world where I have a counterpart who is a historian. By using counterpart relations in this way, Lewis avoids having to require an object to both have and not have particular properties.

The second objection says that counterpart relations should be similarity relations. This is a legitimate objection to any counterpart-based account of de re modality. (That I have a counterpart who is an historian is no reason to proclaim that ‘I could have been an historian’ if my counterpart is not suitably similar to me.) But the present theory has a different scope. Here the counterpart relation serves to ensure that it is more relevant to compare \( p \) with \( q \) than it is to compare \( p \) with some other object in the world that \( q \) inhabits.

This response does not explain why we should identify individuals born at the same time in different futures, as the equivalence relation \( \sim_{NDV} \) requires. A formal derivation of this relation was provided in §3 under the assumptions stated there. It can at least in part be understood intuitively by noting that the only way in which we really can affect the well-being of future people is through their living conditions. Living conditions change with time and we can sometimes affect how they evolve, as in Depletion. This makes it natural to think of ‘the people living in year \( t \)’ impersonally in moral reasoning, as we do in everyday life.

The last claim needs substantiation. To elaborate, consider living conditions of two kinds, \( g \) and \( b \), where \( g \) gives present people higher well-being. As Broome (2018: 230-233) notes, in the case of future people we must make assumptions about their preferences. We will never know if they prefer coffee to tea. But when it comes to things like the amount of available resources, the state of the environment or the prevalence of disease, we can expect their preferences to be similar to ours. Let \( g \) and \( b \) be such that we can confidently assume that future people will prefer \( g \) to \( b \). We are asked to compare two futures, \( w_g \) and \( w_b \), which differ only in that during some time period \( t \), the conditions in \( w_g \) are of type \( g \) and the conditions in \( w_b \) are of type \( b \). We could then quite plausibly hold that \( w_g \) is better than \( w_b \). We would not say that this is so because \( g \) is intrinsically better. We would say that \( w_g \) is better since \( g \) is better for the person that lives in period \( t \) (de dicto).
6.3. Third objection. The third objection points out that although people-at-times-centeredness avoids the standard criticism of time-centeredness (see §4.1), it may still conflict with Pareto over people. I will reply by pointing to a questionable implication of Pareto over people in cases where the conflict arises. More precisely, I will show that if we insist on Pareto over people, then the order in which people live becomes significant. Recall that one argument from person-centeredness insists that order-dependence be avoided (see §5). We will thus see that this argument carries an air of self-defeat.

Before going into details, let me mention why a rejection of the person-centered Pareto axiom should perhaps not come as a surprise. In the case of present people, the idea that an outcome must be favored if it is preferred by some and dispreferred by no-one has strong intuitive appeal. In same-people cases, this idea is consistent with total utilitarianism. But the same can be said of the person-affecting restriction which states (in slogan form) that a favored outcome must be favored by someone. This restriction has received criticism in non-identity cases that many have taken to be decisive.24 In a similar way, we might find reasons to reject the person-centered version of Pareto when we consider future people.

Since Pareto over people is silent unless people are the same in the worlds that we compare, we need a case where this is so for the conflict to arise. Let us therefore consider the following thought experiment from Askell (2018: 13).

**Freezer** A freezer contains infinitely many fertilized eggs, $e_1, e_2, e_3, \ldots$, which can be incubated at any point in time. The person that $e_i$ becomes, once incubated, lives for eighty years on an island that has room for one person at a time. The living conditions are either good, corresponding to utility 2, or poor, corresponding to utility 1.

Let $p_i$ be the person that $e_i$ becomes, once incubated. If we assume (as Askell does) that the time of incubation does not affect $p_i$’s identity, then we can create different futures containing the exact same people.25 Thus, in this thought experiment, the assumptions from §3 do not hold. In particular, in this thought experiment, the Time Dependence Claim (Parfit, 1984: 351) is false.

To see that Pareto over people here conflicts with Pareto over people at times, suppose we can place the island in one of two states, $A$ and $B$. In $A$, the living conditions in period $t$ are good only if $t$ is an integer multiple of 2; in $B$, the conditions in period $t$ are good only if $t$ is an integer multiple of 4—see Table 2.

| period | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ... |
|--------|---|---|---|---|---|---|---|---|-----|
| $A$-utility: | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | ... |
| $B$-utility: | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | ... |

Table 2. Time-series of utilities in state $A$ and state $B$.

24 See footnote 6.
25 One might object that the person that $e_i$ becomes will in fact depend on the time of incubation, and that we therefore cannot create different futures with the exact same people. Since I have assumed that different futures have no individuals in common, the objection only makes this assumption less restrictive.
Let $w$ be the world that obtains if the island is in state $A$ and $e_t$ is incubated in period $t$, $t = 1, 2, 3, \ldots$, and let $w^*$ be the world that obtains if the island is in state $B$ and the embryos are incubated in some other order. Since each state has infinitely many good periods and infinitely many bad periods, the alternative order can be chosen so that $w^*$ is better than $w$ by Pareto over people. By Pareto over people at times, on the other hand, $w^*$ is worse than $w$ (see Table 2). This is the third objection to my proposal.

My counter-objection is that one might plausibly hold that it should not matter in which order the embryos are defrosted. Pareto over people has the peculiar implication that the order does matter, even if living conditions remain unchanged. To see this, fix the island in state $A$ and let $w$ be the world that we get by defrosting $e_t$ at the start of period $t$, $t = 1, 2, 3, \ldots$, precisely as above. By defrosting the embryos in a different order, we can create a world, call it $w^{**}$, such that one person (say $p_1$) is better off in $w^{**}$ than in $w$, and no-one is worse off—see Table 3. Then $w^{**}$ is better than $w$ by Pareto over people.

| period | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ... |
|--------|---|---|---|---|---|---|---|---|-----|
| utility | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | ... |
| $w$: | $e_1$ | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | $e_7$ | $e_8$ | ... |
| $w^{**}$: | $e_3$ | $e_1$ | $e_5$ | $e_2$ | $e_7$ | $e_4$ | $e_9$ | $e_6$ | ... |

Table 3. Two worlds obtained by incubating the embryos in two different orders.

From the people-at-times-centered viewpoint, the order in which the embryos are defrosted does not matter, because the order will not affect the utility of the person born at time $t$ de dicto. So we again have a conflict between person-centeredness and people-at-times-centeredness. From the person-centered viewpoint, both conflicts can be seen as troubling for the concept of people at times. But the conflicts can also be interpreted as more trouble for person-centeredness. On this interpretation, what matters is that the world is populated by people that experience high well-being; who these people are and the order in which they appear is insignificant.

7. Concluding remarks

The question of how utilitarianism should deal with an infinite future goes back to Ramsey (1928). Cain (1995) showed that we get different answers depending on which value bearers are given ultimate moral significance. Two conflicting views subsequently emerged: the time-centered view and the person-centered view. From the time-centered viewpoint, utilities are naturally ordered according to the times when they are realized. The person-centered view denies that there is a natural order. In doing so, it severely limits our discriminatory power. In fact, on contemporary accounts of person-centeredness, most pairs of infinite worlds are incomparable. I have argued that this conclusion can be avoided if we place significance on people in an impersonal way. I have developed this argument in the non-overlapping generations model of Fleurbaey and Michel (2003). The argument might thus help guide our moral reasoning on a variety of economic, social and environmental issues in the context of intergenerational equity.
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