

Consequentialism and Climate Change

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Abstract. The environmental crisis challenges the adequacy of traditional moral theories, particularly in the case of act consequentialism—the view that an act is morally right if and only if it brings about the best available outcome. Although anthropogenic climate change threatens the well-being of billions of humans and trillions of non-human animals, it is difficult for an act consequentialist to condemn actions that contribute to it, as each individual action makes no difference to the probability of whether climate change will occur. Or so one argument goes. This chapter examines the limits and possibilities of a consequentialist approach to climate ethics. It discusses various types of consequentialist theories applicable to the current environmental situation. It outlines outcome-based strategies to address the no-difference problem and to promote individual climate action. Finally, it considers environmental cases of evaluative uncertainty and how a consequentialist could deal with them.

Keywords. Consequentialism; Utilitarianism; Environmental ethics; Climate change; Global warming; The no-difference problem; Inconsequentialism; Moral mathematics; Future generations.

Introduction: Consequentialist Environmental Ethics

Though it comes in many forms, it is characteristic of consequentialism to morally evaluate something by the goodness of its consequences. Ethicists call ‘act consequentialists’ those who believe that the relevant units of moral evaluation are the consequences of each individual act:

Act Consequentialism. I should perform an act X if and only if the consequences of X are impartially best—they are better than the consequences of any other act available to me.

On this view, acting rightly means doing one’s best to improve the world by promoting the most good. If the outcome would have been better had I acted differently, then my act was wrong. Note that the good must be promoted *impartially*, that is, each unit of good is equally important no matter for whom it is good; whether it is something good for a friend or for a distant stranger. So, the moral status of an action is established through a comparison between the way things would be if that action were performed and the way things would be if any other action were performed instead. Other theorists, however, believe that the relevant unit of moral evaluation is an act’s conformity to the most good-promoting set of rules, and so one should evaluate the consequences of an act only indirectly. Consider:

Rule Consequentialism. I should perform an act X if and only if the consequences of accepting a set of rules which recommends doing X would be impartially best—they would be better than the consequences of accepting any other set of rules available to me.

This is still a form of consequentialism because the rightness of the set of rules is justified by the goodness of its consequences. One can further divide consequentialist theories in virtue of the distinction between an act’s *actual* consequences and act’s *expected* consequences (i.e., a function of justified value probabilities). Consider:

Actual Act Consequentialism. I should perform an act X if and only if the actual consequences of X are impartially best—they are better than the actual consequences of any other act available to me.

Expected Act Consequentialism. I should perform an act X if and only if the expected consequences of X are impartially best—they are better than the expected consequences of any other act available to me.

When the effects of a certain course of action are reliably predictable, the differences between Actual Act Consequentialism and Expected Act Consequentialism are mostly negligible. For instance, if a nuclear bomb is detonated in a foreign country purely as an act of political vengeance, one can reliably predict that many will experience excruciating suffering or die without compensating benefits. Such an act is wrong on both Actual Act Consequentialism and Expected Act Consequentialism. However, things become more complicated if, for example, one considers environmental policy. Predicting the future state of the world's climate 100 years from now is only possible within a range of predictions with varying degrees of certainty. On the one hand, an environmental policy that one has overwhelming reason to believe will lead to good results might—for reasons beyond one's control—have catastrophic side effects on the far future. On the other hand, policies that now seem unhelpful may ultimately deliver optimal future outcomes. Actual Act Consequentialism would judge the moral appropriateness of such environmental policies on the basis of their actual contributions to the history of the world (regardless of the evidence that is currently available), while Expected Act Consequentialism would judge their moral appropriateness based on the justified probability estimates of their potential contributions to the history of the world (given the evidence that is currently available). The former comes with the risk of leaving us clueless about the ultimate rightness of a given intervention, while the latter comes with the risk of evaluating harmful interventions as morally right and beneficial interventions as morally wrong.

But what exactly determines the goodness or badness of a state of affairs? Which evaluative properties should be maximised according to consequentialism? To answer this question, one needs to combine consequentialism with a theory of value. Or, in other words, a theory of what makes a state of affairs good or bad. For instance, *classic utilitarianism*—the most traditional form of consequentialism—holds that the morally proper action is the one that maximises the net balance of happiness over suffering. However, there is significant disagreement among consequentialists regarding the nature of the good. Is the good pleasure, happiness, or the flourishing of a sentient creature? And what about the value of desire-satisfaction, achievements, freedom, art, culture, biodiversity, or ecosystems?

Consequentialists have been at the forefront of challenging the anthropocentric view of value and recognising the intrinsic value of non-human entities, particularly non-human animals. Jeremy Bentham, the father of utilitarianism, claimed in 1789 that the welfare of non-human animals should be included in one's moral calculations. This sort of consequentialism was later developed by Peter Singer in his book *Animal Liberation* (1975). Singer propounds *sentientism*, the view that only sentient beings'

conscious experiences hold positive or negative value and have interests that deserve moral consideration for their own sake. On this view, natural areas and non-sentient entities can also be morally relevant, but only on instrumental grounds. Ecological habitats are necessary to support the happiness of many sentient creatures, but they do not have value in and of themselves.

Robin Attfield (1991, 2003, 2014) has opposed *sentience-based consequentialism* by advocating for a form of *biocentric consequentialism*. On his view, all living creatures are intrinsically valuable and worthy of moral concern. They have interests that arise from their capacity to pursue their own good in a goal-directed manner. Events or actions that promote their interests benefit them or make them better off, while those that disrupt their interests harm them or make them worse off. However, Attfield's biocentric approach is inegalitarian, in that not all living beings matter to the same extent. Some creatures have higher capabilities and thus more valuable interests according to their own species-specific nature. So, Attfield argues, harm to a plant is not as morally relevant as harm to a cat or a person, making his view more plausible than versions of biocentric egalitarianism (see Stroppa's chapter in this volume for a discussion on plant ethics).

Avram Hiller (2014, 2015) goes beyond individualistic biocentric consequentialism, by arguing that the goodness or badness of a state of affairs at least partly depends on its ecosystemic values. This view aligns with those of theorists such as Jamieson (2002) and McShane (2004), who also acknowledge the value of ecosystems. Hiller refers to this view as *system consequentialism*. After defining a system as a whole composed of independent parts, Hiller claims that a consequentialist should not simply add up the goods of the relevant individual elements to calculate the best state of affairs, but should also consider the overall ecosystemic goodness produced, or the level of the ecosystem's flourishing.

But biocentric and system consequentialism need to explain how it is possible for non-conscious entities to be welfare subjects. How can anything be good or bad for them? One may argue that, for an entity to matter morally for its own sake, it must possess the capacity for conscious experiences, that is, a capacity for experiences which are such that there is something it is like to have them, for example seeing colours, smelling coffee, or feeling warmth. There is an important sense in which, when I am fully unconscious during anaesthesia or a dreamless sleep, nothing seems to matter, even though I am still alive. Of course, some good things can be instantiated irrespective of my unconscious state, like the birth of my child. But these positive events are only good for me once I become aware of them, or for the overall evaluation of my lifetime well-being. They are never good for the slice of time during which I was fully

unconscious. Like my stomach, an oak tree may have goal-oriented biological functions, but although bettering the health of my stomach can improve my well-being, the stomach itself does not have its own well-being to improve in a morally robust sense. So, the argument goes, a living organism or elements of an ecosystem which lack the capacity for consciousness do not seem to be an appropriate object of intrinsic moral concern (however, see Bradford *Forthcoming* for recent criticisms of this view).

Now that I have introduced a variety of key consequentialist views, I will put aside particular value theories such as those of biocentric and system consequentialism to restrict my focus to the examination of a number of consequentialist approaches to global climate change (but see Driver 2011 for a more extensive introduction to consequentialism).

The No-Difference Problem

According to the 2022 sixth assessment report of the United Nations' Intergovernmental Panel on Climate Change (IPCC), if humanity continues to emit greenhouse gases at the current rate, the world could potentially warm by a catastrophic 4.4 °C (8 °F) by the end of the century. Such a raise in global temperature levels would likely have devastating outcomes. Millions of people would face premature deaths from heat exposure, lots of species of animals would become extinct, new diseases would spread, along with other cascading and long-term impacts. The rise in temperature would also prevent the existence of many future lives, as most people would opt for fewer children, or none at all, due to the adverse conditions. Even a rise of 2 °C would have massive climatic impacts on the planet, including the melting of ice caps, flooding of coastal cities, harm to ecosystems, increased frequency of extreme weather events, and exacerbated violent conflicts over Earth's limited resources. Tremendous pressure will be put on food production and access, resulting in increased malnutrition and micro-nutrient deficiencies, especially in vulnerable regions.

Given the overwhelming evidence for these catastrophic consequences, each person seems to have a moral obligation to do something about their emission-producing activities. While political and government action is crucial, it is also true that if enough individuals were to significantly reduce their greenhouse gas emissions, the harmful effects of climate change would be mitigated. Using public transportation instead of cars, avoiding air travel, choosing vegan options over animal products, and reducing the use of single-use plastic bags are often suggested as ways for individuals to positively contribute to the current environmental situation. But there is a problem concerning the very justification for these moral obligations—a problem that is especially hard for the act consequentialist. Even though a global collective effort

towards low-emission lifestyle choices would mitigate climate change harms, an individual taken in isolation is not in a position to make any difference. The consequences of global warming will occur regardless of whether I decide to fly to, say, Costa Rica this summer. And if the overall magnitude of climate change harms will remain unchanged regardless of my individual emission-producing activities, then how can I be said to act wrongly in doing such activities?

This argument has been referred to as the *argument from inconsequentialism* (Sandler, 2010), the *inefficacy problem* (Nefsky, 2019), or the *no-difference challenge* (Lawford-Smith & Tuckwell, 2020). For the purposes of this discussion, I will refer to it as the *no-difference problem*. The central idea is that, even if a collective voluntary effort to reduce emissions would prevent a climate catastrophe, act consequentialism would not prescribe such efforts as an appropriate response. This view requires me to consider how the history of the world would be if I, as an individual, acted differently. And in the case of anthropogenic climate change, it appears that the history of the world would be unchanged no matter what I do, leaving me without any moral reason to do anything about it. This seems counterintuitive, given that the history of the world would go much better if the majority of us were to choose to emit less. As Shelly Kagan says:

Consequentialism appears to fail even in its own favoured terrain, where we are concerned with consequences and nothing but consequences. Intuitively ... the acts in question need to be condemned because of the results that eventuate from everyone's performing them. Such a situation ought to be grist for the consequentialist's mill. Yet despite this, it seems as though the consequentialist simply isn't in a position to condemn the relevant acts—given the fact that for any given individual, it simply makes no difference whether or not the individual's particular act is performed. (Kagan, 2011, p. 107)

The problem is clear in the case of *direct* emissions from individuals—anthropogenic climate change will occur irrespective of whether I choose not to drive on Sunday. But the problem seems even worse in the case of *indirect* emissions from individuals, such as those resulting from air travel. Environmentalists often argue that flying is morally problematic because of the high levels of hazardous gases emitted by airplanes. But how much of this pollution is owed to each individual passenger? It is the airplane that produces the gases rather than the passengers themselves. And the choice of an individual passenger very rarely affects whether a given flight will take place. Whether there will be a flight from London to New York on a certain day is not contingent on whether I decide to join that flight. So, when indirect emissions are concerned, my behaviour does not even seem to have marginal effects on climate change.

The fact that consequentialism appears unable to provide a straightforward solution to the no-difference problem has been seen as a reason to reject this theory and adopt a different ethical framework. Stephen Gardiner, for example, claims that if an ethical theory lacks the resources to recognise the moral urgency of addressing a global threat, then it is seriously defective and should be rejected (2011, p. 218). He uses act consequentialism as an example of an ethical theory that fails to pass this do-or-die test. How can a robust ethical theory admit the existence of a potentially catastrophic environmental problem, and yet imply that nothing should be done about it? Consequentialists have offered a variety of responses to this challenge. While some bite the bullet, most maintain that there are ways in which individual actions can make a difference to climate change. In what follows, I examine the major responses.

Accepting the No-Difference Problem

It is not surprising that some individuals feel that they lack an individual responsibility to reduce their own output of greenhouse gases. After all, I do not personally increase the likelihood of global warming if I fail to recycle my plastic bottles—it is the collective scale of humanity’s emissions that causes the problem. Some take this argument to show that people do not have any individual moral obligation to pollute less. Baylor Johnson, for example, after naming the threat of anthropogenic climate change ‘the tragedy of the commons’ (T of C), asks whether an agent is morally required to undertake individual steps towards lower emissions, and answers:

The only reason to adopt unilateral restraint is to avert a T of C. So if unilateral restraint cannot reasonably be expected to achieve its purpose, there is no reason, and hence no moral reason to adopt it ... No one person’s use is large enough to harm the commons. Harm results only from the aggregate level of use. (Johnson, 2003, p. 277)

In *It’s Not My Fault*, Walter Sinnott-Armstrong (2005) similarly argues that it is not wrong for an individual to engage in activities that have inconsequential environmental outcomes, such as a Sunday drive. In his view, any attempt to ground environmentally friendly individual obligation is doomed to failure. Only a global political agreement can successfully address the climate crisis, and as such, it is only governments that have an obligation to act. To illustrate his point, he uses the example of a dangerous old bridge. The obligation to make the bridge safe seems to fall on the government. And even if the government fails this obligation, it doesn’t follow that I am personally required to fix the bridge in my free time. This case, in Sinnott-Armstrong’s view, shows

how individual moral responsibility does not always track collective moral responsibility.

It may be true that, in cases involving collective harms, obligations arise largely at the level of the government. But citizens may still have an obligation to take individual action if the government fails to meet its commitments. If the old bridge is in a dangerous state and the government is not taking action to fix it, and if each citizen filling in one crack on their own could collectively fix the bridge, then each citizen may have an obligation to do so. If someone were to die as a result of the bridge being unsafe, each citizen may bear a small individual moral responsibility, since they knew that the government would not address the issue and that their individual effort to help would have been relatively minimal. This analogy could be applied to the case of collective climate action as well. It is clear that governments are failing to take sufficient action, leading to consequences so severe that an individual citizen cannot simply wait for someone to fix the environment for them, ascribing the whole responsibility to the systemic level.

Rejecting the No-Difference Problem: Knock-On Effects

Some may argue that the no-difference problem fails to take into account the full extent of the environmental effects of individual actions. Such actions, although seemingly inconsequential in themselves, may have knock-on effects on the choices made by others and thus bring about a larger collective outcome. Perhaps it is true that my Sunday drive will not harmfully contribute to global warming on its own. But it might have an influence on other people who, inspired by my example, assume that they can also go on weekly Sunday drives. The same could be true for my flight to Vienna. It may encourage others to make similar travel choices and benefit the airline business. In other words, by acting in a certain way and advertising my own choices, I may elicit others to adopt the same moral stance and create snowball effects. This view was defended by Jan Narveson (1976) and challenges the strict separation between individual and collective outcomes. It is intended to provide a fully consequentialist solution to the no-difference problem based on the moral importance of setting a positive example.

Sinnott-Armstrong (2005) remains skeptical of the moral significance of these knock-on effects. First, the scale of this climate crisis, he argues, is too large for an individual to make any difference, even with a little help from admirers. Getting other people to cooperate would be just as pointless as recycling. This seems especially true for the choices of most ordinary individuals, who, most of the time, do not have a chance of significantly influencing the choices of large populations. Second, it seems

that people often overestimate the impact of their own acts on others, making it difficult to accurately assess the frequency and strength of such potential knock-on effects. Third, Sinnott-Armstrong describes the case of David:

David is no environmentalist. He already has a habit of driving his gas guzzler for fun on Sundays. Nobody likes him, so nobody follows his example. But David still has a moral obligation not to drive his gas guzzler just for fun this Sunday, and his obligation has the same basis as mine, if I have one. (2005, p. 292)

So, Sinnott-Armstrong concludes, these sorts of knock-on effects on others are too contingent to ground robust moral obligations.

Making a Difference

There are other ways to reject the no-difference problem. Avram Hiller (2011) maintains that daily individual actions associated with emissions do make a difference (in expectation) to the occurrence of anthropogenic climate change harms, and this provides a consequentialist reason to evaluate such actions as morally problematic. He argues that if one accepts the plausible moral principle that “it is *prima facie* wrong to perform an act which has an expected amount of harm greater than another easily available alternative,” and one recognises that individual emitting actions, for which there are many alternatives, have a non-trivial expected harm, then one must conclude that it is morally required to refrain from these actions (2011, p. 352).

Hiller appeals to some empirical findings. One such finding is John Nolt’s (2011) calculations that the average American’s greenhouse-emitting actions over the course of their lifetime cause serious harm to at least one person. Another result is provided by the National Academy of Sciences, which found that a twenty-five-mile car drive accounts for roughly one-fourth of the emissions produced by an average American’s daily activities. Combining these findings, Hiller estimates that a twenty-five-mile car drive causes one-fourth of a day’s worth of serious harm. In other words, according to Hiller, “going on a Sunday drive is the moral equivalent of ruining someone’s afternoon” (Hiller, 2011, p. 357). If Nolt’s calculations are accurate, Hiller argues, individual emitting actions are *prima facie* wrong, since they have expected harms which are comparable to ruining someone’s afternoon when alternative options are easily available.

However, Hiller’s argument depends on a *share-of-the-total view* of expected harms (Parfit, 1984, pp. 67-70). There is a share-of-the-total within a life—the total expected harm of a lifetime’s greenhouse gas emissions is divided by the number of days

lived by the average person in order to calculate the expected harm of a single Sunday drive—which, at least on some views, is appropriate given that each Sunday drive is carried out by the very same person. But there is also a share-of-the-total across different lives—the total expected harm of anthropogenic climate change as a whole is divided by the number of contributors in order to calculate the expected harm caused by an average life. The problem here is that the shares of expected harm are traced back to individuals despite the joint causation (Lawford-Smith & Tuckwell, 2020). It is unclear whether the contribution of any individual is necessary or sufficient to bring about the total expected harm, since anthropogenic climate change wouldn't occur if others were not participating in the emitting activities as well. It is thus unclear whether individual emitters can be said to bring about corresponding individual expected harms.

John Broome (2012, p. 77) has also defended a view similar to Hiller's, but on the basis of different calculations. He concluded that each individual act with a specific emitting action has some expected harm, but to a lesser degree than that estimated by Hiller.

Moral Mathematics

One can place Hiller's argument within a broader strategy to address the no-difference problem. This strategy argues that the problem rests on a mistake in 'moral mathematics'—a misunderstanding concerning the distribution of individual moral responsibility in cases of morally significant collective activities. Many of those seeking a consequentialist solution to the problem have appealed to the notion of 'chances of making a difference' (in *Reasons and Persons* Derek Parfit says that to overlook small chances is one of the five mistakes in moral mathematics). This approach has been articulated in various forms by Parfit (1984), Norcross (2004), Kagan (2011), and Morgan-Knapp & Goodman (2015). The arguments put forth by these theorists aim to show that, in cases of collectively harmful enterprises, there is always some small probability that an individual action could make a non-trivial difference. These small probabilities, they argue, morally matter.

In *Do I Make a Difference?* Shelly Kagan (2011) argues that individual actions always have some chance of making a major difference in *triggering cases*, i.e. cases in which there are precise thresholds at which enough individual acts trigger a morally relevant outcome. For example, the chances that my Sunday drive's emissions are the ones to cross the threshold for substantial climate change harm may be small, but if they were indeed the emissions that crossed the tipping point, they would cause a great

deal of harm. Kagan contends that as long as there is some non-zero chance that one of my Sunday drives will cause an enormous net negative difference by reaching the emission threshold exactly, there is a moral reason not to take the risk.

On Kagan's view, one can treat triggering cases utilising a standard consequentialist tool, namely, the notion of expected utility. This involves choosing whichever act that would result in the best expected state of affairs, rather than striving to achieve the best state of affairs outright. Since in triggering cases it is still possible to make a sizeable negative difference, a consequentialist will say that you are acting wrongly as the expected utility is negative. Indeed, in cases where the probability of making a negative difference is extremely small but the potential harm is extremely large, multiplying the probability by the magnitude of the potential harm results in a substantial expected utility, enough to outweigh the benefits of alternative courses of action. The tininess in chance is balanced out by the largeness in badness.

Julia Nefsky (2011) criticises Kagan's assumption that, in all utility calculations, the size of the expected harm triggered by an individual act will always outweigh any small chance of bringing it about. If the chances of triggering harm are slim enough, one might even take expected utilities as a justifying reason to emit freely. Nefsky (2017) suggests instead that ethicists should reject the idea that if an act does not make a difference to an outcome, then the act does not play a significant causal role in bringing about the outcome. Even if an act makes no difference, it can still be a non-superfluous causal contributor. And whether an act *helps* facilitate an outcome is what morally matters on her view. But it is uncertain whether this option is available to the consequentialist, who is never interested in helping for its own sake, but for the sake of making the world a better place (perhaps this option could be appealing to a form of consequentialism that embraces a value theory wherein being a non-superfluous causal contributor to a suboptimal outcome is intrinsically bad).

Alongside threshold cases where each individual act has a small chance of triggering the outcome but most likely makes no difference, there are also *non-threshold* cases, where each individual act makes a small, imperceptible difference to the overall outcome. Climate change harms may well be an example of such non-threshold cases. Consider the following version of Parfit's *Harmless Torturers* case (1984, p. 80):

Innocuous Torturers. An electric shock device is connected with one thousand victims, with a strength range of 0 to 1000. At a strength of 0, no electric current is present. At a strength of 2, a slight current is present, but this is too low to be perceived by the victims. Each increase in strength results in an imperceptible increase in voltage. However, after many increases, the victims begin to experience pain, and at a strength of 1000,

they endure excruciating pain. Currently, the machine is set at a strength of 0, but each of a thousand observers can press a button to make a small, imperceptible increase in electric current, earning \$500 in return.

In this scenario, the outcome of excruciating pain is dependent on the collective action of multiple individuals, each of whom can only cause an imperceptible amount of pain. There is no single threshold where one action can trigger the morally relevant outcome, nor is there a small chance of making a difference. Regardless of whether an individual decides to press the button, the outcome is entirely determined by the collective decision of others. Cases of environmental harm caused by collective actions may be analogous to *Innocuous Torturers* in all relevant respects.

Kagan (2011) argues that, under reflection, non-threshold cases are nothing other than triggering cases, and therefore, one can handle them by applying the expected utility machinery (see also Norcross 2004 for a similar treatment of non-threshold cases). He appeals to the fact that non-threshold cases involve vagueness, and so they are vulnerable to a sorites paradox—an ancient philosophical puzzle that is generated by vague terms with unclear boundaries of usage. This goes as follows. In *Innocuous Torturers* the victims do not feel pain at a strength of 0 or 1. If pressing a button does not make a difference to how much pain is experienced by the victims, and if they do not feel pain at 1, then they cannot feel pain at 2. And if they do not feel pain at 2, then they cannot feel pain at 3, and so forth. Therefore, the victims do not experience pain at a strength of 1000, which is a contradiction. To avoid this paradox, on Kagan's view, one must deny the existence of non-threshold cases. There must be points where an individual act makes a difference to the severity of pain—threshold points where the victim reports a different level of pain. Nefsky (2011), though, argues that Kagan's argument either relies on problematic assumptions about the accuracy of experiential reports or relies on a controversial solution to the sorites paradox, namely, to draw a sharp threshold in cases of vagueness. In either case, there is a problem yet to be addressed (for a possible solution, see Broome 2019, pp. 121–125).

However, accepting the existence of threshold points may not be enough to make individual interventions morally wrong. For example, if each time the button is pressed, there is a quarter of a chance that the victims will experience a barely perceptible increase in pain, this harm may not appear significant enough to outweigh the benefits of obtaining \$500. Proponents of expected utility may point to the number of victims—a thousand in this case. They may argue that although each individual act causes only a minuscule amount of harm, one should aggregate these tiny harms when calculating the total expected disutility of pressing the button. But it is far from obvious

whether one can obtain plausible moral verdicts by aggregating tiny harms. Consider this case discussed by Tim Scanlon:

Jones and The Transmitter. Jones has suffered an accident in the transmitter room of a television station. Electrical equipment has fallen on his arm, and we cannot rescue him without turning off the transmitter for fifteen minutes. A World Cup match is in progress, watched by many people, and it will not be over for an hour. Jones's injury will not get any worse if we wait, but his hand has been mashed and he is receiving extremely painful electrical shocks. Should we rescue him now or wait until the match is over? Does the right thing to do depend on how many people are watching? (Scanlon, 1998, p. 235)

Scanlon's answer is that one should rescue Jones now, regardless of how many people are enjoying watching the match and would suffer a minor inconvenience if one were to deprive them of their amusement. But if it is morally appropriate to aggregate tiny harms, then knowing how many people are watching the World Cup could make a difference to whether one should save Jones or not. Many people find this to be implausible (however, see Norcross 2002, Tomlin 2017, and Horton 2018 for some challenges to Scanlon's argument, non-aggregative views, and limited forms of aggregation).

Rule Consequentialism

Act consequentialism, as an individualistic version of consequentialism, does not seem to recognise the collective nature of harms resulting from the climate crisis. Perhaps the consequentialist should not ask "What would the history of the world be like if *I* did this?" but "What would the history of the world be like if *everyone* did this?". Rule consequentialism takes seriously this generalisation test and is concerned about the effects of general adherence to a set of rules, rather than the consequences of individual actions as such. This is why rule consequentialism is usually understood as a form of *indirect* consequentialism: the optimific moral standard applies directly to sets of rules and only indirectly to individual interventions. For example, on *ideal code rule-consequentialism*, argued for by Richard Brandt (1979) and Brad Hooker (2000), the moral status of an individual action—whether it is permissible, required, or impermissible—depends on whether it is permitted, required, or forbidden according to an ideal moral code, that is, a code whose universal (or near-universal) adoption would lead to the best possible world.

Rule-consequentialism is uniquely well-positioned to capture the intuition that there is an obligation to do what is necessary to mitigate catastrophic climate change even though each of us, individually, cannot make any difference. Since the badness of anthropogenic climate change stems from collective activities, it would be a mistake to distribute moral responsibilities directly to individuals. Rather, the focus should be on promoting conformity to a moral code that forbids harmful collective activities such as excessive use of fossil fuels. A moral code that permits the general adoption of highly-emitting activities would make the world a worse place than it would be otherwise, and this is why my highly-emitting actions are morally wrong, even if performing one of them would make no difference on its own.

Rule consequentialism seems to naturally address the collective nature of the climate crisis and provides a plausible moral framework for assessing the wrongness of individual polluting acts. But although proponents of other forms of consequentialism need to do more work to respond to the no-difference problem, rule consequentialism is not without its own criticisms. One obvious problem is that it is difficult to know what the most optimific moral code would look like. It is already notoriously challenging for the act consequentialist to reliably calculate the expected value of a single act given its unforeseen (and unforeseeable) side effects in the far future. Some theorists argue that since act consequentialism is concerned about which act will lead to the best effects overall—counting all the effects—it leaves the agent clueless about the rightness of anything she does (Lenman, 2000). But it seems even more difficult to determine which set of rules, as a package, would bring about the greatest good. This multiplies the cluelessness. Not only would one need to (i) somehow calculate the expected value of the collective adoption of any possible individual rule (to identify the most optimific rules in expectation), but one would also need to (ii) somehow calculate the expected value of the collective adoption of any possible combination of rules into a set (to identify how these rules are to be combined into the most optimific package). Both of these steps are necessary, since certain rules may be optimal taken individually, but sub-optimal taken as a part of a larger set of rules. And both steps are very hard, if possible at all. For example, how can one know whether the most optimific moral code would contain constraints against increasing inequalities if doing so would greatly improve the current environmental situation? And if one does not know which is the most optimific moral code overall, how can one be sure that it would include a rule requiring individual climate action?

Virtue Consequentialism

Some theorists have attempted to solve the no-difference problem by appealing to a consequentialist understanding of virtue ethics. Dale Jamieson (2007) and Ronald Sandler (2010) argue that a focus on the character traits of good consequentialist actors, rather than their actions, can account for individual obligations in a robust way. This view, known as virtue consequentialism, holds that the virtuous person ought to cultivate the set of character traits that promote the most net good. Since virtuous character traits include a personal concern for the environment and for the welfare of those who would be negatively affected by environmental degradation, virtues motivate individual interventions. If I were to unnecessarily drive every Sunday, this would be evidence of my lack of care for climate change harms and a reflection of my morally deficient character.

One obvious problem with this view is that it is difficult to calculate which combination of character traits will ultimately bring about the best possible state of affairs. But even setting aside cluelessness worries, virtue consequentialism might still be unable to fully address the no-difference problem. If my failure to recycle is inconsequential with respect to the harms of climate change, it is unclear why my failure should count as a vicious act. Now, on virtue consequentialism, what matters about an act is what the act reveals about the sort of character a person has. But if virtues are understood as those character traits that are most likely to maximise the good, and I decide to fly frequently and unnecessarily to other countries because I justifiably believe that refraining from it is pointless, then it is difficult to see why I would be cultivating the wrong sort of character by doing so.

In defence of virtue consequentialism, it could be said that character traits often come as a package. Perhaps what motivates you to stop flying is the fact that you care so much about all the future harm due to disruptive climate change that you just don't want to have anything to do with it. And perhaps the character trait of being someone who directs their life through caring might not be removable from one's overall character without producing a substantially worse person. For this and other reasons, the disposition of being a caring person may happen to promote the most good. But one may still doubt that the caring person will necessarily care about emitting actions if these make no difference to climate change harms. If so, the appeal to virtue consequentialism does not provide a satisfactory solution to the no-difference problem, as it remains unclear whether it is vicious to fly or drive when the effects of these individual actions on the environment seem inconsequential.

Individual Climate Action and Effectiveness

Perhaps avoiding direct emissions of greenhouse gases is not the most effective way to minimise climate harms. My own emissions, after all, are a negligible part of the global emissions causing the environmental threat. I could refrain from driving a car for my entire lifetime, spend all my spare money purchasing offsets against my own emissions, and yet neither of these things would be detectable on a global scale. However, this doesn't necessarily mean that I don't have any moral obligation to improve the current environmental situation. It could just mean that I should direct my efforts towards more effective ways to mitigate global warming, such as advocating for policy-level changes, contributing to climate activism, or researching green sources of energy. As Peter Singer writes, actions like avoiding driving "are good things to do, but we should not fool ourselves into believing that the problem of climate change can be solved by individual actions of this kind" (Singer, 2016, p. 26). Given the limited effectiveness of daily individual actions, one argument goes, act consequentialists should ensure that their efforts are directed towards extraordinary, or even heroic, individual actions—the most optimistic means of addressing the environmental crisis.

One worry in addressing the no-difference problem through an effectiveness-based approach is its demanding nature. Rather than placing a moral demand on reducing personal carbon footprints, act consequentialism would call for individuals to make substantial sacrifices, such as changing careers to dedicate much of one's time to the improvement of climate policies or climate science. These actions, while more likely to make a non-trivial difference to the prevention of global warming, would also come with high personal costs in terms of the pursuit of one's other projects, goals, and interests.

But there is also another problem with this view. Like Sinnott-Armstrong (2005), one may doubt that ordinary individuals have a chance to enact extraordinarily effective political interventions, no matter how much they campaign. And one may similarly believe that ordinary individuals do not have a chance of making a difference to the scientific research on climate change, unless they possess exceptional talent. Thus, an individual interested in promoting the most expected value may prioritise other interventions that are more likely to succeed and could prevent a comparable amount of harm, such as research on pandemic prevention.

Evaluative Uncertainty

The no-difference problem is not the only challenge faced by consequentialist moral theories in relation to anthropogenic climate change. The current environmental

situation also involves a variety of uncertainties, both empirical and evaluative. There is *empirical uncertainty* due to the limited knowledge of the ways global warming will shape the future. And there is *evaluative uncertainty* because it is difficult to determine the value of a given state of affairs even when all the relevant physical facts are known. For example, what should one think of climate change if one believes that both human and animal lives are valuable, but one is uncertain about their cross-species comparative value? Or how should one evaluate the harm caused by extreme global warming, which includes the increased risk of human extinction, when one is uncertain about the negative value of preventing future lives from coming into existence? Krister Bykvist (2014) argues that consequentialists should address evaluative uncertainty in a similar manner as they address empirical uncertainty. They should maximise expected overall value, in which the expected value of a course of action consists in the average utility of its possible outcomes weighted by their probabilities. On Bykvist's view, this can be done by determining which acts are rational given an agent's beliefs, even though the agent may have a certain degree of uncertainty regarding the rightness of a certain act. But it may be difficult to identify the most rational course of action when the degree of evaluative uncertainty is very high. Let us consider some of the most puzzling cases.

One may need to estimate the negative value of preventing lives from coming into existence, since, because of climate change, there may be fewer people in the future than there would otherwise have been. But it could be argued that there is no value here to assess at all, as it is not necessarily bad to prevent the existence of future people, even if, all things considered, they would have been happy. The idea is that adding an extra good life to a possible future does not affect its overall value; the future would contain the same level of goodness without the additional happy life. But this view seems to generate some contradictions, or at least this has been argued in debates within population axiology. Consider, for example, the value of three populations (the number represents the positive well-being level of the two people that constitute the population, and “—” represents the non-existence of the second individual in A):

A= (5, —)

B= (5, 5)

C= (5, 10)

Of course, C is better than B, as C is much better for an individual and is not worse for anyone. But if the addition of an extra happy life does not make a difference to the overall value, then A and B would count as equally good. Given that C is better than B and B is as good as A, it follows that C must also be better than A. But if the addition of an extra happy life cannot make an axiological difference, then C must be just as good

as A. This is a contradiction, as C is better than A but also not better than A. One natural way to avoid this contradiction is to say that adding happy lives makes the world a better place at least to some extent. But, as noted by Bykvist (2014), there is still evaluative uncertainty regarding the extent to which the relevant state of affairs would be improved by an additional happy life. So, there is still evaluative uncertainty with respect to the original question of how bad it is to prevent the existence of many happy lives because of anthropogenic climate change (there are alternative approaches to these sorts of cases. See Greaves 2017 for an introduction to population axiology).

This kind of evaluative uncertainty also affects another set of questions regarding population size. Some theorists argue that choosing to have fewer children is an appropriate response to the threat of climate change. This adjustment, after all, would greatly reduce the overall number of people contributing to emissions. There are, of course, strong non-climatic moral reasons against ending the life of an existing person. But the situation is different when it comes to the permissibility of creating a new life that wouldn't otherwise exist. And while small lifestyle adjustments (e.g., choosing to recycle) have marginal effects on a typical human being's lifetime emissions, a prospective parent choosing to have one less child appears to have a much greater impact.

Jamieson suggests that not having children is the most effective way for an American to significantly reduce carbon emissions (2008, p. 189). The American can then have weekly Sunday drives with their SUV, take unnecessary transatlantic flights, eat fast-food, turn on the thermostat, and nonetheless have a lower impact on global warming than if they brought into existence one environmentally friendly American child. According to a study, "a US family who chooses to have one fewer child would provide the same level of emissions reduction as 684 teenagers who choose to adopt comprehensive recycling for the rest of their life" (Wynes & Nicholas 2017, p. 3). These findings raise questions about the moral implications of having children in a world threatened by anthropogenic climate change.

But one cannot determine the overall moral verdict of a consequentialist with respect to such procreative choices without considering the other consequences of having children. For many individuals, the decision of whether to have a child is one of the most meaningful decisions they will ever make. Regardless of their preferred number of children (whether it be many, one, or none), the satisfaction of this preference is likely to be a primary determinant of their own well-being. And the act consequentialist will take into account the parents' well-being in his calculations. But more importantly, the axiological significance of causing a child to exist as a conscious, well-off being remains highly controversial. The consequentialist generally answers

affirmatively to the question of whether more happy people increase the overall value of the world. It is, however, unclear to what extent this is true and how bad the non-existence of such lives might be. And if one doesn't have an answer to how much value an extra life adds to a state of affairs, one doesn't have an answer to whether the consequentialist should recommend people to have fewer children as a response to the current climate change crisis.

Another question that involves evaluative uncertainty is how to make value comparisons between human lives and non-human animal lives when assessing the expected utility of a possible future. One may think that, all else being equal, each sentient life contributes equally to the value of a state of affairs (with the counterintuitive implication that there is no stronger moral reason to save a child over a lizard in a rescue situation). Or one may think that, at least on average, a human life contributes more to the overall goodness of the world than a non-human animal life; not merely in virtue of species membership, but because of the intrinsic individual qualities of a human's mental life, which allow for more and higher goods. If so, how much greater welfare does a human life carry? Questions concerning cross-species axiological comparisons are particularly difficult to deal with, and yet are crucial when assessing the effects of climate change. Many of these effects will directly harm countless non-human animals. But there will be winners too. As Jeff Sebo (2022) notes, species with shorter lifespans and smaller bodies like insects and parasites will likely proliferate in a warmer world, so that their population could exponentially increase, while the populations of species with longer lifespans and larger bodies like mammals will simultaneously decrease. Without a way to make cross-species comparisons of welfare, one can't tell whether anthropogenic climate change will make things worse or better for non-human animals, all things considered. There is indeed a debate about whether invertebrates are capable of conscious experiences such as pleasure and pain (Mikhalevich & Powell, 2020; Birch, 2022). If invertebrates are sentient, then they should be able to instantiate some level of well-being. And given the massive magnitude of invertebrates on the planet, their total level of well-being could be very high and would greatly influence the consequentialist calculus.

Conclusion: The Consequences of Consequentialism on Climate Change

The impending consequences of anthropogenic climate change are likely to involve an immense magnitude of harm. One might want an ethical theory that acknowledges the fact that each of us has a moral obligation to do something in response to this

environmental threat. But the individual actions of each of us cannot prevent or even significantly mitigate it. This is a problem for consequentialist moral theories—the no-difference problem—since on these views each of us ought to engage in the course of action that will result in the best outcome available. If an act cannot make a difference for the better, there is no moral reason to perform it. And so, the argument goes, consequentialism won't encourage you to recycle, buy green energy, avoid unnecessary driving, or perform any action that would reduce your own carbon footprint.

Consequentialists have a wide range of strategies to respond to the no-difference problem. Some argue that individual emissions have non-trivial expected harms, whilst others appeal to the significance of knock-on effects on the behaviour of others. Some contend that the no-difference problem is based on a misunderstanding of moral mathematics. And others agree that minor lifestyle adjustments have insignificant environmental impacts but argue that, rather than being a reason to do nothing, this is a call to action for more effective interventions. Finally, there are those who embrace versions of virtue or rule consequentialism. None of these strategies are invulnerable to objections, but that is hardly a surprise in practical ethics. What matters here is that, although the no-difference problem is often seen as a crucial objection to consequentialist moral theories, such theories are remarkably resourceful.

But even if one of these consequentialist strategies were successful, it would still be difficult to determine the most optimistic course of action given the current environmental situation. There is both empirical uncertainty about the likelihood of an action's outcome, as well as evaluative uncertainty about how to assess it morally. Even if one had a general understanding of which species will flourish and which species will perish in a warmer world, one could not know whether this will make the world better or worse, all things considered. This example of evaluative uncertainty shows how hard decisions concerning climate change can be. In a sense, the fact that consequentialism naturally recognises the importance of evaluative uncertainty may be seen as a desirable feature of this view. A moral theory delivering easy answers in spite of such uncertainty would be greatly underestimating the complexity of the world when it's a matter of doing the right thing.

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