

## DISCOUNTING AND THE FALLACY OF DIVISION\*

Matthew Rendall

University of Nottingham, [matthew.rendall@nottingham.ac.uk](mailto:matthew.rendall@nottingham.ac.uk)

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In recent years concern has grown that climate change could mean disaster. Martin Weitzman estimates a roughly five percent chance of a rise in global temperatures of more than ten degrees Celsius over the next two centuries, and a one percent chance that they could go over twenty, changes which would “effectively destroy planet Earth as we know it.”<sup>1</sup> Provided that they did not lead to our extinction, these losses would burden many generations of future people. A huge amount of expected utility is at stake, even if the probability of catastrophe is low.<sup>2</sup>

One might think that economics, with its roots in the utilitarian tradition, would give this great weight. Yet prominent economists have recommended only modest near-term measures to mitigate climate change. When the British government’s 2006 *Stern Review on the Economics of Climate Change* called for energetic action, some attacked its conclusions as extreme. Perhaps the most common criticism was that the *Review* had employed an inappropriately low discount rate, giving too much weight to costs and benefits in the future. William Nordhaus presented a *reductio ad absurdum*. He asked readers to imagine a “wrinkle” in the climate that would reduce world consumption by a tiny amount starting in 2200. “Using the *Review*’s growth projections,” he charged, “the *Review* would justify reducing per capita consumption for one year today from \$10,000 to \$4,400 in order to prevent a reduction of consumption from \$130,000 to \$129,870 starting two centuries hence and continuing at that rate forever after.”<sup>3</sup>

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Nordhaus was describing what Derek Parfit calls a “Rawls-Scanlon case.” In these situations, made famous by John Rawls and T. M. Scanlon, “we can either save one person from some great burden, or give much smaller benefits to many other people, who are all much better off.”<sup>4</sup> Examples include:

1. *Chocolates for the Well-off*: By allowing a single person to starve, we can give one chocolate each to a very large number of well-off people. Should we do it?
2. *World Cup*: Jones has had an accident in a TV station that is currently broadcasting the World Cup and is suffering agonizing pain. Should we interrupt the broadcast to rescue him at the price of frustrating hundreds of millions of soccer fans?
3. *Blue and the Many*: If we can save one person, Blue, from a thousand days of pain, or a vast number of other people (“the Many”) from ten days of pain each—but not both—how many would be needed to make the latter the better choice?<sup>5</sup>

These cases reflect a familiar worry about utilitarianism: since it allows the aggregation of costs and benefits, it can justify imposing great burdens on some in order to bring small benefits to others. Nordhaus’s “wrinkle experiment” is a version of the same problem: trade-offs between small benefits to a vast number of the rich (our descendants) and severe sacrifices for the poor (ourselves). That giving equal weight to future costs and benefits would impose intolerable obligations on the present generation has been one of the most influential arguments for the economic practice of discounting. “If there were no time preference,” writes Kenneth Arrow, “what would the optimal solution be? Each unit sacrificed would yield a finite utility loss to the first generation, but to compensate, there would be a gain, however small, to each of an infinity of generations....[G]iven any investment, short of the entire income, a still greater investment would be preferred.” As a justification for discounting, Arrow invokes Samuel

Scheffler's concept of an "agent-centered prerogative," according to which agents can defensibly accord greater weight to their own interests.<sup>6</sup>

The present paper probes the ethics underpinning Nordhaus's and Arrow's claims. I argue that while an agent-centered prerogative can justify discounting benefits that would accrue to those better off than we are, it cannot justify discounting harms that would accrue to those worse off. Proponents of discounting commonly assume that future generations will be richer. In fact, as Thomas Schelling has noted, some of their members will be poorer than the present-day inhabitants of rich countries. To discount these people's consumption on the ground that they will be richer is to commit a fallacy of division. In addition, however, we must discriminate between possible states of the world. In most scenarios, future generations in the aggregate are richer. We can defensibly discount and even disregard costs and benefits that will accrue to richer individuals in these scenarios, such as those in Nordhaus's wrinkle experiment. In a few scenarios, however, most or all future people are poorer. With even a one percent chance that our greenhouse gas emissions will render our descendants permanently worse off than we are, the expected number of people rendered worse off—understood as the number of future individuals multiplied by their chance of impoverishment—is very great. There is no excuse for discounting these costs and benefits—or for foot-dragging on climate change.

## I. TWO RATIONALES FOR DISCOUNTING

The force of Nordhaus's wrinkle scenario comes from our feeling that there must be something wrong with any analysis that implies that we could be obliged to suffer deprivation and even death (let us call it "the sacrifice") in order to prevent a larger number of rich people from suffering a minor reduction in consumption. We might think that the sacrifice would not in fact make the world a better place, that it would be better if we did not make it. On this view,

there is something wrong with the value theory underpinning the utilitarian judgment. On one version of the sufficiency view, for example, no number of small pleasures can be, on their own, as important as a good and fulfilling life. A benefit that makes the difference between a good life and a poor one is lexically more valuable than any number of benefits to those whose lives already exceed that level.<sup>7</sup> If no number of small benefits to the rich could make up for the impoverishment of today's population, then the sacrifice would not have the best results. This view faces a serious objection: the "black hole problem," or "problem of waste." If we give absolute priority to keeping people above a minimum level of welfare, then this could consume nearly all our resources.<sup>8</sup> Some people suffer under medical conditions that are deadly, painful, or seriously restrict their lives. So long as we can bring a single person across the threshold of well-being, at whatever cost, the sufficiency view will tell us to give priority to doing so. Even in the case of incurable diseases, so long as there is a chance that medical research could discover a way of curing or mitigating them, we will have to do all we can. In reality, we do not spend every penny on serious ailments before relieving other people's mild pain. Most of us think that this leads to the better outcome.<sup>9</sup> If small gains for the many in Nordhaus's wrinkle experiment cannot outweigh large losses for the few today, we need an explanation of why this should be true across time, but not, it seems, among contemporaries. It is not obvious what this would be.

We might instead concede that it would be optimific for our generation to make the sacrifice, provided that enough future rich people stood to benefit, but deny that we would have any duty to make it. Some have seen discounting as a way of capturing a prerogative to favor our own generation's interests over the general good. Most of us believe that we can defensibly give some priority to ourselves and to those close to us. Scheffler advocates recognizing an agent's moral right "to assign a certain proportionately greater weight to his own interests than to the interests

of other people.”<sup>10</sup> Citing this “agent-centered prerogative,” Arrow argues that the present generation can legitimately discount the future, precluding any obligation to sacrifice everything for the sake of others. On this rationale for discounting, “pure time preference” is not really based on time at all. Rather, it discounts for personal distance from the beneficiary.<sup>11</sup> Each generation can legitimately accord greater weight to its own interests by a factor which Scheffler terms “M.” Formulated thus, it is not clear that Scheffler’s argument can do the work that Arrow intends it to do. Scheffler does not state what the value of M should be, nor does he claim it can be precisely specified, but he clearly intends this weighting to be limited.<sup>12</sup> More future people would have to benefit before we would be required to impoverish ourselves, but so long as enough stood to gain, we would still have to make the investment. Surely Arrow means to claim that we could defensibly refuse to do so however many future people would benefit. If the prerogative is to justify this conclusion, it must be understood differently.

Here it will be helpful to consider two rationales for an agent-centered prerogative. One is rule-consequentialist, and appeals to overall consequences. A moral code that assigned equal weight to the welfare of strangers, we might argue, would be psychologically wrenching, and require us to attach much less importance to nearly everything that makes our own lives worth living. For us to be prepared to impoverish ourselves whenever it benefited enough rich people would require extreme self-abnegation. That would greatly reduce human happiness. No plausible moral theory, so we might argue, will demand it. Certainly we would not be blameworthy for failing to internalize or act on such a principle. Rejecting the sacrifice, on this view, would be a suboptimal action which was nevertheless justified—at any rate excused—by the optimal moral code.<sup>13</sup> This rationale would be pertinent no matter how many future people stood to gain. Scheffler, in contrast, does not claim his prerogative will promote the best

consequences, even in the long term. Rather, he defends it as the natural consequence of the fact that “people do not typically view the world from the impersonal perspective.”<sup>14</sup> Given that this is how we approach morality, we might find we lack sufficient reason to sacrifice ourselves on behalf of people who would be much better off, however numerous.<sup>15</sup>

Consider the following variation on *Blue and the Many*: The National Health Service can either cure Bill’s rare disease, sparing him a thousand days of severe pain, or treat the day-long migraine headaches of ten million people. We might accept that treating the headaches would be best, and that the NHS would be justified in making this choice.<sup>16</sup> Suppose, however, that a clerical error leads the NHS to decide to cure Bill all the same. This would not make things go best. Yet we might think that Bill would not be morally obliged to alert the NHS to its error. Why not? Even if the NHS would be justified in imposing the best solution on Bill, it would be unreasonable to expect him to impose a thousand days of severe pain on himself, just to spare ten million strangers day-long headaches. If he remained silent and let himself be treated, we would not blame him. But unless the action is blameworthy, in one key sense it is not wrong, and certainly Bill has less reason to refrain from it.<sup>17</sup> Likewise, even if in Nordhaus’s wrinkle scenario it would be optimistic for us to invest half of next year’s income, we would be under no obligation to do so. We could argue that we could not reasonably be expected to impose harsh sacrifices on ourselves for the sake of people who would in any case be much richer.

If everyone can defensibly accord disproportionate weight to her own interests, then it may seem we risk “a moral standoff, in which there is no right answer to the question of what one should do,” leading to a situation “tantamount to moral anarchy.”<sup>18</sup> One justification for the existence of the state is that in such cases it can impose solutions that serve the general good.<sup>19</sup> On what Parfit calls Kantian Contractualism, it is wrong to treat people in a way that they could

not rationally accept. Parfit holds that we always have sufficient reason to accept principles that lead to the impartially best outcome, and in cases of conflicting interests these are the only principles to which everyone could rationally consent.<sup>20</sup> If that is true, then it gives the state a justification for enforcing these principles. But it does not oblige individuals like Bill to observe them of their own free will. Unlike the state, they also have sufficient agent-relative reason to resist the principles that would disadvantage them, and can reasonably either accept or reject them.<sup>21</sup> Even if some trade-offs benefiting a well-off majority at the expense of a worse-off minority make things go best, and even if the state can justifiably impose them, it does not follow that the minority is morally obliged to accept these sacrifices in a state of nature. Such a state of nature is the relationship in which we stand to future generations.

## II. INEQUALITY AND HARM

All the foregoing arguments against an obligation of self-sacrifice presuppose that future people will be better off, or at least not much worse off. This would obviously have to be so if we object to the sacrifice on sufficientarian grounds. But it must also be true if the appeal to an agent-centered prerogative is to be at all convincing. Return to the case of Bill and the NHS. Suppose that this time the choice is between the NHS curing Bill's thousand days of severe pain, and using the same resources to prevent the deaths of ten million people. Not only would the latter choice be better, but Bill would be to blame if he failed to speak up when the NHS chose to treat him, losing the opportunity to prevent a worse harm to many others. Likewise, even defenders of conventional discounting admit that considerable sacrifices would be justified to prevent climate change that would impoverish future people.<sup>22</sup>

This comparison with Bill might be challenged. We might think that Bill has a special duty to his fellow citizens to speak up, whereas mitigating climate change is, in Schelling's

words, “very much like a foreign aid program, with some of the foreigners being our own descendants who live not on another continent but in another century.”<sup>23</sup> Common-sense morality holds that it is permissible, or even obligatory, to give greater weight to benefiting co-nationals than foreigners. We might believe it is similarly permissible to give greater weight to benefiting our own generation. Climate change, however, is a harm we inflict on future generations.<sup>24</sup> Can we justifiably discount that as well? Parfit suggests a comparison:

Perhaps the U.S. Government ought in general to give priority to the welfare of its own citizens. But this does not apply to the infliction of grave harms. Suppose this Government decides to resume atmospheric nuclear tests. If it predicts that the resulting fall-out would cause several deaths, should it discount the deaths of aliens? Should it therefore move the tests to the Indian Ocean? I believe that, in such a case, the special relations make no moral difference.<sup>25</sup>

Scheffler’s prerogative has been criticized for authorizing agents not only to do less good than they might, but also to cause harm. Scheffler was clearly troubled by this implication, and later suggested that a principled rationale might be found for limiting his prerogative to the former. Discussing discounting in a co-written chapter, Arrow himself notes the difference “between passing on future *benefits* and imposing future *damages*—a distinction found in most ethical and legal systems but absent from the conventional economic evaluation of future impacts.”<sup>26</sup>

We might consider some harm to future people acceptable. Many think that it is sometimes justifiable, particularly for governments, to do harm to promote the greater good.<sup>27</sup> In this case, however, we are not talking about promoting the greater good. We are asking whether we may favor our own generation’s interests over the greater good. It is hard to see how this could be



justified, if our actions would both harm future generations and leave them worse off than we are. Harms that would impoverish future people should receive full weight.

If runaway climate change should devastate the planet, it may leave distant future generations poorer than we are. Even if they are richer, they may not be better off. Severe global warming might so impoverish these people's lives that increased consumption opportunities could not compensate for the loss.<sup>28</sup> Weitzman estimates a roughly five percent chance of more than ten degrees of warming in the next two centuries if we fail to take strong action, and about a one percent chance of more than twenty. With even Nordhaus conceding that "no law of nature or economics guarantees that outcomes of rapid climate change will not be catastrophic," it is rational to assign some subjective probability to disaster scenarios.<sup>29</sup> Assume a twenty percent chance that Weitzman is right. That works out to one chance in a hundred of at least 10°C of warming. Discounting gives these potential damages far too little weight. Why?

### III. THE FALLACY OF DIVISION

In a seminal 1995 paper, Schelling warned against a "fallacy of composition." While future generations would probably be richer in the aggregate than the present one, he noted, this did not mean that action by rich countries to mitigate climate change would transfer resources from the poor to the rich. The future residents of poor countries would likely still be poorer than the residents of rich countries today.<sup>30</sup> Technically, Schelling was describing a fallacy of division. The fallacy of composition is to assume that because the parts of a whole have a property, the whole itself possesses it, whereas the fallacy of division is to assume what is true of the whole must be true of each of its parts.<sup>31</sup> The misnomer notwithstanding, Schelling's point was well-taken. Even if future generations will be richer in the aggregate, this will not be true of all their members, nor is this a reason to discount benefits to these worse-off people.

Ironically, Schelling went on to commit a fallacy of division of his own. The real question, he argued, was not whether mitigation would be progressive in its effects—it would—but whether the rich could do as much good for the poor through mitigation as they would by devoting the same amount of resources to helping today’s poor. “[I]f GDP per capita continues to increase in most of the developing world,” he wrote, “as I expect and as the optimization models assume, marginal utilities of the beneficiaries will be much higher during the first 50 years—before [greenhouse gas] abatement benefits become significant—than in the second 50 years.” This being the case, it would be “logically absurd to ignore present needs and concentrate on the later decades of the coming century”<sup>32</sup>—or, presumably, the centuries and millennia thereafter.

Would it? Consider a new version of the story in which Bill, if he is not treated, will suffer a thousand days of pain, and the NHS makes a mistake. This time it decides to relieve Bill’s pain—which is very expensive to treat—rather than give one chocolate each to ten million healthy young adults. The chocolate contains an oral vaccine designed to confer immunity to a virus which is currently making the rounds, and which has a 1/10,000 chance of mutating and killing all ten million people. Bill might reason that he is very badly off and the others are expectedly very well off, even after taking into account the small chance that they will all be killed by the virus. He might conclude that it would be unreasonable to expect him to undergo great pain for people who are expectedly much better off. That would be the wrong conclusion. If it were certain that the other people would end up better off, Bill could reasonably refuse. But while the others are expectedly better off, they might end up worse off. If they do, it will be cold comfort that they would have been better off than Bill in other possible states of the world. “Suppose that unbeknownst to me someone flips a coin,” Hugh Lazenby writes, “with the expectation that if it falls on heads I will be made the beneficiary of a vast fortune. The coin falls

on tails. What have I gained? I might have gained a lot. But I have actually gained nothing. I do not experience what I might have gained. I experience only what I have.”<sup>33</sup> The same will be true for the ten million here.

Instead, Bill should disaggregate the scenarios that could transpire. In most possible states of the world, if Bill alerts the NHS, he will make a great sacrifice that brings many well-off people trivial benefits (a yummy chocolate). It may be that he can defensibly disregard these expected benefits. But in the 10,000th scenario, if Bill keeps mum, he will be responsible for ten million deaths. Since there is one chance in ten thousand that this scenario will materialize, this amounts to the expected loss of 1,000 lives.<sup>34</sup> Bill has no excuse for disregarding these expected costs. If they materialize, he will be better off than the victims. Even if Bill can defensibly give more weight to his own interests, it could not be as great as this.

Nor can we justify such a gamble with climate change. As Schelling recognized, we should disaggregate future generations into the inhabitants of rich countries and those of poor ones. But we must also distinguish among different possible states of the world. Even if in most scenarios in which we go on emitting large quantities of greenhouse gases, the majority of future people will be better off than we are today, in a few scenarios we will render most or all of them worse off. If these materialize, the fact that the losers had a good chance of being better off will be small compensation.<sup>35</sup> Here again, we should disaggregate the scenarios.<sup>36</sup> The expected value of an action is the value of its possible outcomes, multiplied by the probability that they will obtain. Given the vast numbers of people likely to live over the rest of history, even a small chance of permanently impoverishing the planet entails enormous expected impoverishment. The rich countries could bear the entire worldwide costs of stabilizing greenhouse gases at a manageable level without imposing nearly comparable sacrifices on most of their citizens.<sup>37</sup> As

Schelling observed, were mitigation to cost two percent of world GDP, “the doubled per capita income that might have been achieved by 2060 is reached in 2062. If someone could wave a wand and phase in, over a few years, a climate-mitigation program that depressed our GNP by two percent in perpetuity, no one would notice the difference.”<sup>38</sup> By failing to lower their emissions, the inhabitants of the industrialized countries are taking a small chance of rendering an almost unimaginable number of people worse off than they are. They have no justification for discounting these expected losses.

#### IV. HOW TO DISCOUNT DEFENSIBLY

Here is the sketch of a defensible approach to discounting. We would start by calculating the expected impartial value of a policy’s costs and benefits in each growth scenario.<sup>39</sup> Next, we would weight each scenario’s costs and benefits for legitimate self-regarding preference. When benefits would go to much better-off people, we would disregard them, unless they were cost-free to provide. Benefits to those who would not be better off would be discounted by Scheffler’s *M*, assuming we consider such preference acceptable. Harms that would render their victims worse off than we are would receive full weight. Finally, we would multiply each scenario’s weighted value by its probability and sum them to obtain the policy’s expected value.<sup>40</sup> Should this seem too radical a reform, an alternative would be to assign such great disvalue to irreversible catastrophic outcomes that discounting cannot overwhelm it. This is effectively Martin Weitzman’s approach.<sup>41</sup> It has been criticized on the ground that even the severe impoverishment of the world’s current population cannot plausibly be said to have near-infinite disutility.<sup>42</sup> But such a judgement appears reasonable once we recognize that it captures losses not only to the current generation, but to all succeeding ones.

Either approach draws the sting from Nordhaus's wrinkle experiment.<sup>43</sup> There would be no obligation to bring "consumption for one year today from \$10,000 to \$4,400 in order to prevent a reduction of consumption from \$130,000 to \$129,870," since in this scenario the future people would be much better off than we are, and we could legitimately discount the latter benefits. Suppose, on the other hand, that there is a one percent chance of our carbon emissions causing global warming that so damages the planet that average welfare remains significantly lower than that of the inhabitants of rich countries today. Assume also that this would cause a collapse in world population—so that only one billion people would live per century—and that the human race would live another 100,000 years. A simple calculation shows that in just this scenario our emissions would entail the impoverishment of an expected 10 billion people. Low probability catastrophic risks, some of which might be rational to run if only our own lives were at stake, become indefensible when they could permanently mar the planet.<sup>44</sup>

It might seem that the problem of over-demandingness will reemerge. Nordhaus warns that if we attached infinite disutility to existential risks, "we would likely drown in a sea of anxiety at the prospect of the infinity of infinitely bad outcomes." He suggests that on this logic it could be rational to fight preventive wars to prevent barely discerned power shifts in the distant future.<sup>45</sup> While it is true that nearly anything we do could in principle prove catastrophic, in most cases we have no more reason to believe that acting is riskier than abstaining. It is often more dangerous, for example, to launch preventive wars than to forego them. With climate change, on the other hand, we have a well-theorized causal mechanism, with good theoretical and empirical reasons for believing that higher greenhouse gas concentrations are more dangerous than lower ones.<sup>46</sup> Moreover, when we can identify a real possibility of irreversible catastrophe, what is the

alternative to precaution? If century after century we continue to run even small existential risks, sooner or later, we are bound to lose the gamble.<sup>47</sup>

Nordhaus argues that the willingness of contemporary societies to accept catastrophic risks such as those of nuclear winter or the destruction of the earth by a particle accelerator, and their unwillingness to take more than modest measures to ward off the threat of large asteroids, reveals that we attach limited weight to removing even the most apocalyptic threats.<sup>48</sup> If Nordhaus's only aim were to describe the policy priorities of existing societies, no sensible person could disagree with him. But he seems to think that this tells us what we should do. That is to make the mistake of thinking one can get an "ought" from an "is."<sup>49</sup> Nordhaus would not, presumably, hold that other economic policies that states adopt—say, slashing social welfare spending—are justified merely because voters support them. To insist that the preferences of today's consumers determine what we should value is to accept that if the present generation desired massive future death and suffering, there would be no value to preventing it, and indeed value in bringing it about. Nordhaus does not claim that we should discount harm to foreigners if we care about them less. What then is his justification for discounting harm to future generations?<sup>50</sup>

## V. CONCLUSION

It is a mistake to assume that the future will be richer. Instead, we should recognize that there are different possible futures, in many of which our descendants are much richer, and in a few of which they are poorer. Cost-benefit analysis can defensibly discount benefits that would require us to make great sacrifices on behalf of people who would in any case be better off. That is not because these benefits would be of no value. Rather, it is because we could not reasonably be expected to sacrifice ourselves in order to produce them. At the same time, CBA should give full

weight to harms that would render our descendants worse off than we are. Given the vast number of people likely to live in the future, this requires us to avert any realistic danger of doing catastrophic damage to the planet.

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<sup>1</sup> Martin L. Weitzman, “On Modelling and Interpreting the Economics of Catastrophic Climate Change,” *Review of Economics and Statistics* XCI, 1 (February 2009): 1-19, quoted passage at p. 5. See also John Broome, *Climate Matters: Ethics in a Warming World* (New York: W. W. Norton, 2012), pp. 77-78, 130-31, 178.

<sup>2</sup> Bernward Gesang, *Klimaethik* (Berlin: Suhrkamp, 2011), pp. 146, 150-53, 157-58.

<sup>3</sup> William D. Nordhaus, “A Review of the *Stern Review on the Economics of Climate Change*,” *Journal of Economic Literature* XLV, 3 (December 2007): 686-702, at p. 696.

<sup>4</sup> Derek Parfit, *On What Matters*, vol. 1 (Oxford: Oxford University Press, 2011), at p. 246.

<sup>5</sup> Examples from: Roger Crisp, “Equality, Priority, and Compassion,” *Ethics* CXIV, 4 (July 2003): 745-63, at p. 754; T. M. Scanlon, *What We Owe to Each Other* (Cambridge MA, Belknap Press, 1998), p. 235; Derek Parfit, *On What Matters*, ed. Derek Parfit and Samuel Scheffler (Oxford: Oxford University Press, 2011), vol. 2, pp. 246-47, 255. I have borrowed Karl Widerquist’s term for the chocolates case. See his “How the Sufficiency Minimum Becomes a Social Maximum,” *Utilitas* XXII, 4 (December 2011): 474-80.

<sup>6</sup> Kenneth J. Arrow, “Discounting, Morality, and Gaming,” in Paul R. Portney and John P. Weyant, eds., *Discounting and Intergenerational Equity* (Washington, DC: Resources for the Future, 1999), pp. 13-21, quoted passage at p 14.

<sup>7</sup> Harry Frankfurt, “Equality as a Moral Ideal,” *Ethics* XCVIII, 1 (October 1987): 21-43; Dale Dorsey, “Headaches, Lives, and Value,” *Utilitas* XXI, 1 (March 2009): 36-58.

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<sup>8</sup> Robert Huseby, “Sufficiency: Restated and Defended,” *Journal of Political Philosophy* XVIII, 2 (June 2010): 178-97, at pp. 186-87; Clark Wolf, “Intergenerational Justice, Human Needs, and Climate Policy,” in Axel Gosseries and Lukas H. Meyer, eds., *Intergenerational Justice* (Oxford: Oxford University Press, 2009), pp. 347-76.

<sup>9</sup> John Broome, “All Goods are Relevant,” in *Summary Measures of Population Health: Ethics, Measurement, and Applications* (Geneva: World Health Organization, 2002), p. 728; Mark S. Stein, *Distributive Justice and Disability: Utilitarianism against Egalitarianism* (New Haven: Yale University Press, 2006), pp. 78, 187-88; Widerquist, “How the Sufficiency Minimum Becomes a Social Maximum,” p. 476.

<sup>10</sup> Thomas C. Schelling, “Intergenerational Discounting,” *Energy Policy* XXIII, 4-5 (April-May 1995): 395-401, at p. 398; Arrow, “Discounting, Morality, and Gaming,” p. 16; Samuel Scheffler, *The Rejection of Consequentialism* (Oxford: Clarendon Press, 1982), p. 20.

<sup>11</sup> Derek Parfit, *Reasons and Persons* (Oxford: Clarendon Press, 1987), p. 485.

<sup>12</sup> Samuel Scheffler, “Prerogatives Without Restrictions,” *Philosophical Perspectives* VI (1992): 377-97, at p. 378; cf. Richard J. Arneson, “Moral Limits on the Demands of Beneficence,” in Deen Chatterjee, ed., *The Ethics of Assistance* (Cambridge: Cambridge University Press, 2004), 33-58, at p. 45.

<sup>13</sup> Parfit, *Reasons and Persons*, chapter 1; Parfit, *On What Matters*, vol. 1, pp. 385, 404.

<sup>14</sup> Scheffler, *Rejection of Consequentialism*, p. 60.

<sup>15</sup> Douglas W. Portmore, *Commonsense Consequentialism: Wherein Morality Meets Rationality* (Oxford: Oxford University Press, 2011), p. 26.

<sup>16</sup> Alistair Norcross, “Comparing Harms: Headaches and Human Lives,” *Philosophy & Public Affairs* XXVI, 2 (Spring 1997): 135-67.



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<sup>17</sup> See Brian McElwee, “Demandingness Objections in Ethics,” forthcoming in the *Philosophical Quarterly*, <http://pq.oxfordjournals.org/content/early/2016/03/15/pq.pqw020.short> (accessed 9 July 2016); Stephen Darwall, “Agreement Matters: Critical Notice of Derek Parfit, *On What Matters*,” *Philosophical Review* CXXIII, 1 (January 2014): 79-105, at pp. 97-98.

<sup>18</sup> T. M. Scanlon, “How I Am Not a Kantian,” in Parfit and Scheffler, *On What Matters*, vol. 2, pp. 116-39, at p. 138; Larry Alexander, “Scheffler on the Independence of Agent-Centered Prerogatives from Agent-Centered Restrictions,” *THIS JOURNAL*, LXXXIV, 5 (May 1987): 277-83, at p. 281.

<sup>19</sup> We might, of course, question whether in reality states act in this optimific way.

<sup>20</sup> Parfit, *On What Matters*, vol. 1, chapters 8, 16-17; vol. 2, pp. 251-53.

<sup>21</sup> Cf. Scheffler, *Rejection of Consequentialism*, p. 34. Parfit maintains that if there is only one principle to which everyone could rationally consent, then “no one's objection to this principle could be as strong as the strongest objections to every alternative,” and hence nobody could reasonably reject it (*On What Matters*, vol. 2, pp. 245-46). This seems to ignore the possibility that all individuals might all have sufficient impartial reason to accept the principle—but that some of them might also have sufficient agent-relative reason to reject it. See Scanlon, “How I am Not a Kantian,” p. 137.

<sup>22</sup> See, for example, Nordhaus, *A Question of Balance*, p. 147.

<sup>23</sup> Schelling, “Intergenerational Discounting,” pp. 397-98, quoted passage from p. 397.

<sup>24</sup> For this criticism of Schelling's analogy, see Partha Dasgupta, “Time and the Generations,” in Robert W. Hahn and Alistair Ulph, eds., *Climate Change and Common Sense: Essays in Honor of Tom Schelling* (Oxford: Oxford University Press, 2012), pp. 101-30, at pp. 121-22. It is true that without our emissions, most of the individuals they will affect would never exist at all.

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Climate change will, however, harm distant future generations *de dicto*, if not *de re*, and that is what matters here. See Caspar Hare, “Voices from Another World: Must We Respect Interests of People Who Do Not, and Will Never, Exist?” *Ethics* CXVII, 3 (April 2007): 498-523.

<sup>25</sup> Parfit, *Reasons and Persons*, p. 486.

<sup>26</sup> Shelly Kagan, “Does Consequentialism Demand Too Much? Recent Work on the Limits of Obligation,” *Philosophy & Public Affairs* XIII, 3 (Summer 1984): 239-54, at p. 251; Scheffler, “Prerogatives without Restrictions;” K. J. Arrow et al., “Decision-Making Frameworks for Addressing Climate Change,” in James P. Bruce, Hoesung Lee and Erik F. Haites, eds., *Climate Change 1995: Economic and Social Dimensions of Climate Change* (Cambridge: Cambridge University Press, 1996), 53-77, at p. 60; emphasis in original.

<sup>27</sup> Broome, *Climate Matters*, p. 65.

<sup>28</sup> Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011), pp. 176-177, 177 n. 48, 283-85, 326; Matthias Frisch, “Climate Change Justice,” *Philosophy & Public Affairs* XL, 3 (September 2012): 225-53, at pp. 231-32, 238-40.

<sup>29</sup> William D. Nordhaus, “An Analysis of the Dismal Theorem,” Cowles Foundation Discussion Paper No. 1686 (2009), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1330454##](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1330454##) (accessed 30 May 2015), pp. 16-21, quoted passage at p. 17; Martin L. Weitzman, “Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change,” *Review of Environmental Economics and Policy* V, 2 (July 2011): 275-92, at pp. 290-91. In his 2008 book, Nordhaus expresses doubt about catastrophe scenarios, but states that we cannot rule them out (*A Question of Balance: Weighing the Options on Global Warming Policies* [New Haven: Yale University Press, 2008], p. 147).

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<sup>30</sup> Schelling, “Intergenerational Discounting,” p. 398.

<sup>31</sup> See Maurice A. Finnochiaro, “The Fallacy of Composition: Guiding Concepts, Historical Cases, and Research Problems,” *Journal of Applied Logic* XIII, 2, Part B (June 2015): 24-43, at pp. 28-29.

<sup>32</sup> Schelling, “Intergenerational Discounting,” quoted passage at pp. 399-400.

<sup>33</sup> Hugh Lazenby, “Broome on Fairness and Lotteries,” *Utilitas* XXVI, 4 (December 2014): 331-45, at p. 341.

<sup>34</sup> Cf. Douglas P. Lackey, “Taking Risk Seriously,” *THIS JOURNAL*, LXXXIII, 11 (November 1986): 633-40, at p. 639.

<sup>35</sup> Dominic Roser and Christian Seidel, *Ethik des Klimawandels: Eine Einführung* (Darmstadt: WBG, 2013), p. 60.

<sup>36</sup> Nicholas Stern, *A Blueprint for a Safer Planet: How to Manage Climate Change and Create a New Era of Progress and Prosperity* (London: The Bodley Head, 2009), p. 87; Charles S. Pearson, *Economics and the Challenge of Global Warming* (Cambridge: Cambridge University Press, 2011), pp. 52-53.

<sup>37</sup> Gesang, *Klimaethik*, pp. 159-60.

<sup>38</sup> Thomas C. Schelling, “The Cost of Combating Global Warming: Facing the Tradeoffs,” *Foreign Affairs* LXXVI, 6 (November-December 1997): 8-14, at p. 10.

<sup>39</sup> For utilitarians, this would be their expected utility; prioritarrians would give extra weight to benefits going to the worse off. See Derek Parfit, “Equality or Priority?” in Matthew Clayton and Andrew Williams (eds.), *The Ideal of Equality* (Basingstoke: Palgrave Macmillan, 2002), pp. 81-125.

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<sup>40</sup> In their discussion of an “ex post” approach to discounting, Simon Dietz and Geir B. Asheim appear to be proposing something along these lines. “Climate Policy Under Sustainable Discounted Utilitarianism,” *Journal of Environmental Economics and Management* LXIII, 3 (May 2012): 321-35, at pp. 325-26; cf. Pearson, *Economics*, pp. 52-53.

<sup>41</sup> Weitzman, “Modelling and Interpreting.” [Acknowledgement of commentator who suggested this point omitted for anonymous review.]

<sup>42</sup> Lawrence Summers and Richard Zeckhauser, “Policymaking for Posterity,” *Journal of Risk and Uncertainty* XXXVII, 2-3 (December 2008): 115-40, at pp. 124-25.

<sup>43</sup> Cf. Stéphane Zuber and Geir B. Asheim, “Justifying Social Discounting: The Rank-Discounted Utilitarian Approach,” *Journal of Economic Theory* CXLVII, 4 (July 2012): 1572-1601, at p. 1573.

<sup>44</sup> O. Godard, “The Stern Review on the Economics of Climate Change: Contents, Insights, and Assessment of the Critical Debate,” *Surveys and Perspectives Integrating Environment & Society* I, 1 (2008): 17-36, at p. 30.

<sup>45</sup> William D. Nordhaus, “The Economics of Tail Events with an Application to Climate Change,” *Review of Environmental Economics and Policy* V, 2 (Summer 2011): 240-57, at p. 254.

<sup>46</sup> Sven Ove Hansson, “Decision Making Under Great Uncertainty,” *Philosophy of the Social Sciences* XXVI, 3 (September 1996): 369-86, at p. 378; Richard K. Betts, “Striking First: A History of Thankfully Lost Opportunities,” *Ethics and International Affairs* XVII, 1 (March 2003): 17-24; Henry Shue, “Deadly Delays, Saving Opportunities: Creating a More Dangerous World?” in Stephen M. Gardiner et al, eds., *Climate Ethics: Essential Readings* (Oxford: Oxford University Press, 2010), 146-62, at pp. 148, 154.

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<sup>47</sup> Nick Bostrom, “Existential Risk Prevention as Global Priority,” *Global Policy* IV, 1 (February 2013): 15-31, at p. 25.

<sup>48</sup> Nordhaus, “Economics of Tail Events,” pp. 253-54.

<sup>49</sup> K. Ott, “Reflections on Discounting: Some Philosophical Remarks,” *International Journal of Sustainable Development* VI, 1 (January 2003): 7-24, at pp. 18-19.

<sup>50</sup> Simon Caney, “Human Rights, Climate Change, and Discounting,” *Environmental Politics* XVII, 4 (August 2008): 536-55, at pp. 547-48; Dale Jamieson, *Reason in a Dark Time: Why the Struggle Against Climate Change Failed—and What It Means for Our Future* (New York: Oxford University Press, 2014), pp. 125-26.