No Free Lunch: The Significance of Tiny Contributions

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1 Introduction

Consider a variant of Parfit's 'drops of water' example (1984, p. 76), as presented by Nefsky (2016, pp. 1-2):

> There are ten thousand men in the desert, suffering from intensely painful thirst. We are a group of ten thousand people near the desert, and each of us has a pint of water. We can't go into the desert ourselves, but what we can do is pour our pints into a water cart. The cart will be driven into the desert, and any water in it will be evenly distributed amongst the men.
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> If we pour in our pints, the men's suffering will be relieved. The problem is, though, that while together these acts would do a lot of good, it does not seem that any individual such act will make a difference. If one pours in one's pint, this will only enable each man to drink an extra ten thousandth of a pint of water. This is no more than a single drop, and a single drop more or less is too miniscule an amount to make any difference to how they feel. If this is right, it's unclear why any of us has reason to add our pints. Yes, these men are suffering, but if adding my pint will not make a difference… then what reason do I have to do so?

The example vividly illustrates a more general ethical quandary: How can we account for the rightness or wrongness of acts that clearly contribute to some morally significant outcome – but which each seem too small, individually, to make any meaningful difference? There are a variety of views surrounding this issue.[1] This paper's aim is to provide a new reason to think that even the tiniest of contributions to some significant out-

[1] Some – Glover (1975), Otsuka (1991), Arntzenius and McCarthy (1997), Norcross (2004), Kagan (2011), Lawford-Smith (2016), Parfit (ms.) – argue that even very small contributions to morally significant outcomes always have some chance of making, a relevant causal difference. Others – Strang (1960), Cullity (2000), Kutz (2000), Sinnott-Armstrong (2005), Petersson (2013), Pinkert (2015), Nefsky (2016) – are willing to grant that sufficiently small contributions make no relevant causal difference, suggesting that we must look elsewhere to explain the apparent rightness or wrongness of such acts. See Nefsky (2015) for discussion of views in this latter camp.

come (e.g. the addition of one drop of water to someone's canteen) must be capable of making a relevant causal difference (e.g. of relieving someone's suffering to some extent). Existing arguments for this thesis tend to be *sorites-style* arguments. Such arguments imagine varying a subject's predicament bit by bit until it is clear that a relevant difference has been achieved.[2] The arguments offered in this paper are structurally different. For this reason, they are not vulnerable to objections that have been leveled against the sorites-style arguments.

2 Background

The general problem raised above can arise in the context of many real-life decisions: Should I walk or drive? Should I order tofu or chicken? Should I vote or stay at home? In making such decisions, we may be tempted to think that it does not matter how we decide (e.g. 'It's not like *my* choice will have any real effect on anyone, so what difference does it make?'). It is important to distinguish two types of case that might prompt one to have this thought: *threshold* and *non-threshold* cases.[3] Naturally, both types of case involve some collection of acts that suffices to bring about some morally significant outcome. What differs is how the acts combine to produce that outcome.

In threshold cases, there are sharp boundaries, or thresholds, such that, when they are crossed, morally significant effects are triggered. Voting contexts provide a clear ex-

[2] Arntzenius and McCarthy (1997), Norcross (1997), Kagan (2011).
[3] Nefsky (2016, p. 4).

ample. When such thresholds are present, there will typically be some chance – however small – that one will perform a threshold-crossing act (e.g. by casting the deciding vote in an election). For this reason, at least some threshold cases tend to be amenable to a simple expectational treatment (e.g. 'True, your vote is unlikely to matter, but if you do cast the deciding vote, then your vote will matter a great deal.').[4]

Cases of the second type can seem more philosophically troubling. In this type of case, when a person dismisses the idea that her act will make a difference, it may seem that there is no chance at all that her act will make any real difference. Nefsky's version of the 'drops of water' example is offered as a case of this sort (2016, p. 4):

> There is no chance that pouring your pint into the cart will make a difference to the alleviation of the men's suffering. A single pint added only allows each man to drink a single drop more, and – however much water he is receiving – one drop more or less is simply not enough to change his level of suffering.

These non-threshold cases have a gradual structure that lacks sharp boundaries. In such cases, even though some collection of acts is sufficient to bring about a morally significant outcome, no individual act is supposed to make any real difference (a difference in someone's level of suffering), on its own.[5] Cases with this feature – if genuinely possible – raise difficult questions about how to account for the rightness or wrongness of the

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[4] For extended developments of this idea, see Singer (1980, pp. 325-327), Parfit (1984, pp. 73-75), Gibbard (1990, pp. 26-27), Norcross (2004, pp. 232-3), Kagan (2011, p. 124). Nefsky (forthcoming) and Budolfson (forthcoming) argue that the move to expected consequences does not adequately handle all threshold cases, often permitting or recommending inaction when action seems called for.

[5] Often, the claim is only that no individual act makes a *perceptible* difference. This paper sidesteps the issue of perceptibility, focusing directly on whether any act, on its own, makes a morally significant difference.

contributing acts.[6] Some have argued that such cases are possible. For instance, Sinnott-Armstrong suggests that the harm caused by global warming results from a collection of individually harmless acts:[7]

> You might think that my driving on Sunday raises the temperature of the globe by an infinitesimal amount. I doubt that, but, even if it does, my exhaust on that Sunday does not cause any climate change at all. No storms or floods or droughts or heat waves can be traced to my individual act of driving. It is these climate changes that cause harms to people. Global warming by itself causes no harm without climate change. Hence, since my individual act of driving on that one Sunday does not cause any climate change, it causes no harm to anyone. (2005, p. 291)

On the other hand, there are difficulties associated with allowing for cases like this. There is something strange about the thought that, say, a collection of individually harmless acts could cause a grave harm. In order to examine an important argument against the possibility of cases of this type, it is helpful to describe explicitly the core principle operative in the 'drops of water' example.

> **No Small Improvement:** The addition or subtraction of a single drop of water to/from someone's canteen cannot (on its own) make her suffering better or worse.

If one endorses a principle like this, it is clear that one will be vulnerable to a problem akin to that posed by the *sorites paradox*: Repeated appeal to the principle seems to generate absurd conclusions. Arntzenius and McCarthy (1997), Norcross (1997), and Kagan (2011) all argue along these lines that no such principles could be true. Though their arguments are framed in terms of Quinn's (1990) self-torturer example, we can examine a

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[6] Cullity (2000), Kutz (2000), Petersson (2013), Pinkert (2015), Nefsky (2016).

[7] See Lawford-Smith (2016) for an empirically-informed argument against Sinnott-Armstrong's position.

representative version of their arguments that applies to the example at hand.

> **Sorites-Style Argument:** Suppose, for *reductio*, that No Small Improvement is true. Suppose we have before us a thirsty traveler. We ask her whether she is in pain (due to her intense thirst), and she tells us that she is.
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> We then ask: What would she say, if she had one additional drop of water? Via No Small Improvement, we can be sure that her suffering would not have been any less bad. So, presumably, she still would answer our question in just the same way. Similarly, if she had two extra drops, her suffering would still be as bad as in the one-drop-added case. So, again, presumably, she would answer our question identically if she had two extra drops.
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> If we continue reasoning this way, we will infer that she would answer the question identically, even if she had a full pint of water to drink. Since this is an absurd result to reach, No Small Improvement must be incorrect.

An interesting reply to this argument comes from Nefsky (2011, pp. 379–394). She observes that there are two ways of running the foregoing argument – one *direct* and one *behavioral*. And, she argues, each version suffers from a different defect. Though the argument given above makes reference to how the thirsty traveler would *describe* her situation, Nefsky notes that this appeal to behavior might be seen as an inessential feature of the argument. The purest, most direct version of the argument goes like this:

> **Direct Version:** When the traveler has no water, she is clearly suffering. If No Small Improvement is true, then her suffering is not relieved at all by any drop added. It follows that her suffering must be just as bad at the end of the series, when she has a full pint. This is absurd.

Per Nefsky, the problem with this argument is that 'it amounts to giving a sorites argument as though it were a simple reductio proof that there cannot be vague boundaries' (2011, p. 385). After all, not everyone thinks that the sorites paradox shows, say, that, in fact, it is possible to make someone bald by removing a single strand of his hair.

So, in short, the direct argument relies on controversial assumptions about how the sorites paradox should be handled.

One way to remedy this issue is to invoke the traveler's *behavior* in the argument:

> **Behavioral Version:** The traveler's answer to the question ('Are you in pain?') will differ substantially when her canteen is empty and when it is full. This can only happen if there is at least one sharp point at which the traveler's response to the question changes. Such a sharp change is incompatible with No Small Improvement.

But, Nefsky notes, the behavioral route faces other difficulties. While it seems clearly true that the traveler's answer must change somewhere, it is unclear what to infer from this fact. Nefsky asks: 'why should we accept that differences in the victim's pain reports are perfect indicators of differences in his sensations?' (2011, p. 380). To address this question, one would need to unpack the behavioral argument in more detail: Is the imagined procedure supposed to be something we could actually carry out with a real person? Or is the point a purely conceptual one? Either way, this is controversial territory.[8] Given that the issues are controversial, it would be nice if there were some alternative way to put pressure on No Small Improvement – one that steers clear of the controversies presented above.

As it happens, such an alternative form of argument is available – one which puts pressure on No Small Improvement by drawing out one of its peculiar consequences. Specifically, No Small Improvement entails that we can generate a *free lunch*. That is, if No Small Improvement is true, then we will often be able to reduce a person's suffering

[8] For a more thorough investigation into these issues, see Nefsky (2011, pp. 379-394).

from thirst significantly, at no cost to anyone else – just by moving water around. In certain contexts, this result can seem implausible.

3 Two 'Free Lunch' Arguments

In this section, we suppose that No Small Improvement is correct: Giving or taking a drop of water cannot change the severity of a thirsty person's suffering. But before we can examine the 'free lunch' arguments, an important clarification is in order.

Suppose that Brutus and Jocko are among those suffering in the desert. Each has been given some water. And suppose that we take away a single drop from each of them. From the standpoint of total suffering, does this change anything? Given No Small Improvement, the situation should not be relevantly different: Brutus's suffering is unchanged; Jocko's suffering is unchanged. Since the suffering is the same for each person, their total suffering, presumably, is also unchanged. Of course, this property should not only apply to groups of two: If we take one drop of water from each member of some group (or give one drop to each member of a group), it should not change the total suffering of the group – no matter how many people are in the group. With this clarification in place, we can consider the first 'free lunch' argument.

> **Optimization:** 10,000 desert travelers are suffering from intensely painful thirst. Each of their empty canteens holds up to a pint of water, which consists of ten thousand drops. We have 5,000 pints of water, which we can distribute however we wish.
>
> We can't satisfy everyone. But, still, some distributions may be better than others with respect to the goal of relieving as much suffering as possible. (Perhaps the travelers have differing levels of tolerance for thirst.) In any event, suppose that, somehow, we succeed in implementing an *optimal* distribution of water (that is, a distribution that relieves at least as

much suffering as any other). But then we tinker with it. Via No Small Improvement, we can remove one drop of water from each traveler's canteen (or, at least, from the non-empty ones) without making her suffering worse. We can then give the drops collected (which total at least half a pint[9]) to one traveler who would benefit from receiving more.

We have generated a free lunch. As a result of our tinkering, the lucky recipient has benefited, while no one's suffering was made worse. So the initial distribution must not have been optimal, which was supposed to be a stipulation of the setup. In making this argument, one needn't rely on any sorites series – nor need one rely on controversial assumptions linking suffering and behavior. So the argument is immune from the objections that were raised against the sorites-style arguments.

The argument does, however, make an assumption that can be questioned: It assumes the existence of an optimal distribution (that is, a distribution not worse than any other, in terms of suffering relief). This assumption seems plausible on certain conceptions of suffering – especially those that allow suffering to be quantified precisely in principle. But, arguably, such conceptions of suffering will be unattractive to proponents of No Small Improvement, who may think of suffering as, by its very nature, imprecise. They may not agree that there is an unequivocal fact of the matter concerning which of several distributions relieve the more suffering than the others. If this is right, the proponent of No Small Improvement has a way of escaping the seeming absurdity posed by the Optimization argument.

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[9] No matter how we distribute the 5,000 pints of water, we will have to give some water to at least 5,000 people (since we cannot give more than a pint to anyone). For this reason, when we extract one drop from everyone who has some, we will end up collecting at least 5,000 drops (which is half a pint).

However, a further worry looms – one that the defender of No Small Improvement cannot shrug off so easily. While the Optimization argument may not prove decisive, it illustrates something important – namely, how No Small Improvement gives rise to free lunches. We can always extract one drop from many people and then give those drops to a lucky recipient. This fact can be exploited by a second free lunch argument to generate an especially thorny problem.

> **Staircase:** The 10,000 travelers are suffering from intensely painful thirst. They come upon a massive, 10,000-step staircase. Each step contains a partially filled canteen. The canteen on Step 1 contains 1 drop; the canteen on Step 2 contains 2 drops; and so on.
>
> The travelers manage to arrange themselves on the staircase, with one traveler per step. Just before they take a drink, the traveler on Step 1 proposes an idea: 'Wait! I was thinking… What if you all just moved down one step, and I moved up to the top?' She proceeds to explain that on this proposal, no one would be harmed (for all others forfeit only one drop), while she would benefit.[10]

Again, we have a situation that gives rise to a free lunch: If the travelers shift themselves as suggested, the traveler sent to the top benefits, while no one's suffering is made worse. But this can seem implausible when we note that the situation before the shift seems relevantly similar to the situation after it: There is still one traveler per stair. If it helps, we can imagine that the travelers are all perfect clones, and experience pain from thirst identically. From the standpoint of total suffering, shuffling people around on the staircase does not seem likely to improve matters. Yet No Small Improvement seems to imply that shifting everyone as described would reduce the total suffering.

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[10] Structurally similar examples are discussed (though for different reasons) by Parfit (2003, p. 383, fn. 16), Temkin (2012, pp. 440-445), Voorhoeve (2014, pp. 82-84), and Barnett (forthcoming).

Like the Optimization argument, the Staircase argument does not rely on a sorites series – nor does it rely on any controversial assumptions linking suffering and behavior. Unlike the Optimization argument, however, the Staircase argument also does not require us to assume that total suffering can be quantified precisely in principle, or that there is some 'best' distribution of water which relieves as much suffering as any other. The Staircase argument assumes only that if one person's suffering is relieved substantially while no one else's suffering is affected, then the total suffering is reduced. It is hard to see how this assumption can be denied. But, if it is right, it seems clear that No Small Improvement is incorrect. One drop of water can make a difference to someone's suffering. So it turns out that there is a satisfyingly direct answer available to the moral quandary non-threshold cases seemed to pose: What moral reason do I have to pour in my pint? Answer: If I refrain, the travelers will suffer more. Even tiny contributions are morally significant.

4 Small Differences and Competing Claims to Aid

Even if we consider the preceding question settled, nearby issues merit exploration. Compare two versions of the 'drops of water' example. In the first (which is just the original scenario), the ten thousand contributors provide *diffuse* aid: Each pools her pint in the water cart, thereby helping every traveler a tiny bit. In the second version, the contributors provide *concentrated aid*: Each gives her entire pint to one traveler directly, thereby helping that traveler a great deal. In both situations, so long as everyone con-

tributes, the travelers will all be helped equally. But the types of contribution being made are different across the two cases. And, though the contributions may relieve equal suffering, it does not necessarily follow (unless we are utilitarian) that each type of contribution has equal moral importance.

Indeed, there is something attractive about the thought that concentrated contributions matter more, morally, than diffuse ones do – other things the same. Giving a full pint of water to someone with none seems extremely valuable; giving a single drop to each of ten thousand travelers (who already have some) can seem less so – even if both acts relieve equal suffering.[11] Call this thesis 'Diminished Significance of Diffuse Aid.' Despite the thesis's appeal, an argument from Parfit (2003, p. 383, fn. 16) – which resembles the second free lunch argument – can be used to pose a challenge to the thesis. It is worth briefly discussing the problem that arises and a possible way out.

Suppose we are deciding between two arrangements of travelers on the staircase:[12]

Alphabetical: The travelers are arranged alphabetically, with Aaron at the top and Zoe at the bottom.
Downshift: The travelers are arranged alphabetically, with everyone shifted down one step and with Zoe at the top.

Though the outcomes are similar in many respects, if Diminished Significance of Diffuse Aid is correct, then choosing the second of these options is morally preferable.

[11] For discussion of closely related issues, see Taurek (1977), Parfit (2003), Temkin (2012, pp. 45-52), and Voorhoeve (2014).

[12] To ensure that the principle stated above applies here, we must make the slightest of tweaks to the case: We'll have 10,001 travelers instead of 10,000, and we'll add to our staircase a Step 0, which has on it an empty canteen.

Choosing Downshift amounts to giving Zoe a whole pint more than she was guaranteed to receive, while choosing Alphabetical amounts to giving everyone else one drop more than they were guaranteed. From a certain angle, it can seem implausible that either of these options is morally preferable to the other: The two prospective outcomes are rearrangements of each other – with exactly one traveler per step. If we idealize the case appropriately (the travelers have equal tolerance for thirst, they possess equally strong claims to aid, etc.), the view that it is morally better to bring about Downshift can seem unmotivated. At least, if it is morally better to bring about Downshift, we face a vivid, pointed question about why this is the case.

A potential answer to this question can be drawn from Voorhoeve's (2014) paper about how to adjudicate between competing claims to aid.[13] In Voorhoeve's framework, each person who stands to benefit (or lose out) from an upcoming decision has a claim on the decider. The strength of each person's claim is, other things equal, proportional to what is at stake for her. So, in the case at hand, Zoe's claim is the strongest – she stands to gain a full pint of water if things go her way. For each other traveler, only one drop is at stake – though together they have numbers on their side. How are we to resolve this conflict between one strong claim (favoring Downshift) and many weak ones (favoring Alphabetical)? On Voorhoeve's view, only *relevant* claims matter. And, roughly, a weaker claim is *relevant* to a stronger one just in case a person would be permitted

[13] For Voorhoeve's treatment of a similar example, see his (2014, pp. 82-84).

to satisfy the weaker claim *for herself* rather than satisfy the stronger claim for someone else. (In this way, the account depends upon the widely held view that morality permits at least some partiality to self.) Irrelevant claims are thrown out – no matter how many such claims there may be. Returning to the case at hand, it seems clear that the many travelers' weaker claims are irrelevant, in Voorhoeve's sense: No traveler would be morally permitted to secure a single drop for herself at the cost of a full pint to someone else. So, in short: Zoe's claim is relevant; the other ones are not. That is why, according to Voorhoeve's 'aggregate relevant claims' view, we are required to implement Downshift.

The approach presents an interesting and creative way of justifying the thesis of Diminished Significance of Diffuse Aid. Of course, the 'aggregate relevant claims' view faces its own challenges.[14] For example, if one were able to choose any arrangement of travelers, the presence of the additional options would make choosing Downshift no longer preferable to choosing Alphabetical.[15] So the question of whether concentrated contributions have greater significance than diffuse ones remains open. What is clear, though, is that tiny contributions, even when diffuse, do make a real difference.[16]

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[14] For discussion of difficulties facing the proposal, see Badano (2016), Halstead (2016), and Voorhoeve (2017).

[15] Halstead (2016, pp. 798–99) presses a well-developed version of this worry. See Voorhoeve (2013, pp. 413–16 and 2014, pp. 78–79) for discussion of the initial problem, and see Voorhoeve (2017) for a reply to Halstead.

[16] For helpful comments and suggestions, I would like to thank Nomy Arpaly, Anna Brinkerhoff, Harry Chalmers, David Christensen, Jamie Dreier, Mahan Esmailzadeh, Dave Estlund, Arianna Falbo, Tom Fisher, Tobias Fuchs, Kelly Gaus, Louis Gularte, Yongming Han, Ying Huang, Rachel Leadon, Han

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