Ethic Theory Moral Prac (2009) 12:279–290
DOI 10.1007/s10677-009-9157-7

A Defence of Weighted Lotteries in Life Saving Cases

Ben Saunders

Accepted: 30 January 2009 / Published online: 26 February 2009

Abstract The three most common responses to Taurek's 'numbers problem' are saving the greater number, equal chance lotteries and weighted lotteries. Weighted lotteries have perhaps received the least support, having been criticized by Scanlon What We Owe to Each Other (1998) and Hirose 'Fairness in Life and Death Cases' (2007). This article considers these objections in turn, and argues that they do not succeed in refuting the fairness of a weighted lottery, which remains a potential solution to cases of conflict. Moreover, it shows how these responses actually lead to a new argument for weighted lotteries, appealing to fairness and Pareto-optimality.

Keywords Aggregation · Fairness · Lotteries · Scanlon · Taurek · Weighted lotteries

1 The Numbers Problem

Scanlon (1998) takes up the challenge posed by Taurek (1977) and tries to show that a deontologist can count numbers without engaging in problematic aggregation. Taurek argued that there is no basis to prefer saving five people to saving some other individual, whom he calls David, since no one suffers anything worse than a death and there is no 'point of view of the universe' from which we can judge either outcome better or worse. When we attend only to individual losses, we are forced to admit that letting five die is worse for each of them, but saving them rather than David is worse for David. Taurek's conclusion was that, in this situation, the would-be rescuer can save who she likes, but it would be fair to toss a coin between the two groups, giving everyone an equal chance of being saved.

Taurek's problem met various responses (e.g. Parfit 1978; Kavka 1979; Sanders 1988). Three main proposals in the literature are equal chances for each group (Taurek 1977),

B. Saunders (✉)
Philosophy and Corpus Christi College, University of Oxford, Merton Street, Oxford OX1 4JF, UK
e-mail: ben.saunders@philosophy.ox.ac.uk

saving the greater number (Scanlon 1998), and a weighted lottery, which gives different chances to each group (Kavka 1979; Kamm 1985; Timmermann 2004).[1] My aim is to defend weighted lotteries against several objections. The argument proceeds in two stages. Firstly, I examine Scanlon's argument that saving the greater number is preferable to either equal chances or a weighted lottery, showing that the argument works only given certain background assumptions, so there is no general reason to reject weighted lotteries. I then turn to two further objections against weighted lotteries raised by Hirose (2007), arguing that these cannot be sustained together and, by combining insights from each response, we reach a new argument for weighted lotteries.

2 Scanlon on Equal Chances

Taurek argues that, if we refuse to aggregate gains and losses to separate individuals, we cannot say that it is a worse thing *simpliciter* for five to die rather than for one other to die.[2] It would not be wrong, he claims, for David to prefer that he is saved and the five die, so it would be permissible for a third party to take David's perspective and save him rather than the five. This supposes a strong form of impartiality, so that what is acceptable for David is also acceptable for a third party, which might be questioned, but here I focus on Scanlon's solution to the problem.

In conflicts between two individuals, or equally-sized groups, it seems that tossing a coin would be a fair way of deciding who to rescue. The controversy comes when Taurek proposes giving equal chances to differently sized groups. Scanlon argues that it would be reasonable for members of the larger group to reject such a proposal, on the grounds that it gave them no weight in the decision procedure. Suppose, for example, that we are about to toss a coin to decide whether to save *A* or *B* and then we notice the presence of *C* alongside *B*. If we go ahead and toss the coin then, Scanlon claims, we simply ignore *C*'s presence and this is objectionable. *C* can insist that the decision procedure gives her claim independent weight. Although this does not seem to be Scanlon's analysis, I interpret this as saying it would be *unfair* not to give *C*'s claim weight. Since fairness is itself a contested notion, it is necessary to begin by trying to make my use more explicit.

3 Fairness

It is generally agreed that, when faced with equal claimants, tossing a coin to decide who to save is fair, but justifications for this policy vary (Broome 1984, 1990; Saunders 2008; Stone 2007). On one influential account (Broome 1990), fairness requires proportional satisfaction of claims and thus, where people are equal in all relevant respects, equal treatment. In Broome's view, however, the only absolutely fair thing to do would be to save no one (Broome 1990, p.95 and 1998, p.956). This is obviously suboptimal, but Broome does not think fairness dictates what we should do all things considered. We also have reason, based on the betterness of the outcome, to save at least someone. Note that even someone who expresses scepticism about impersonal betterness in conflict cases (Taurek 1977, pp.304–5) can accept that it is better that

[1] I assume any plausible weighted lottery will give the larger group a greater chance of being saved—though I discuss Hirose's inverse lottery objection—but not necessarily a proportional chance. See the distinction between the General Weighted Lottery (GWL) and Procedure of Proportional Chances (PPC), below.

[2] It is assumed throughout that these individuals are equal in all morally relevant respects.

someone is saved rather than no one, since this is a Pareto improvement. In this case, it seems we should save someone, even if that would be unfair (because one person's claim to rescue is satisfied, while another person's equal claim to rescue is not). Broome thinks tossing a coin introduces a 'surrogate satisfaction' (Broome 1990, pp.97–8)—although the two claims will not actually be equally met, they at least have an equal chance of being met.

Broome's account has been criticized (Hooker 2005). It seems counter-intuitive to say that the fairest thing to do is to save no one. While I will have more to say about fairness (particularly in section 11), I cannot offer a fully-developed theory of fairness here. Indeed, given the diversity of ways in which fairness is invoked (Hooker 2005, p.350), it is possible that it does not pick out a unified value but a plurality of considerations (Beitz 1989, p.99; Crowder 2002, p.54). It seems to me that it must involve not only equal concern but equal *and maximal* concern (Hooker 2005, pp.340–1). In other words, I think fairness itself gives us reason to save someone—so to give each person a 10% chance would not be fair. Moreover, I shall argue that equal consideration need not lead to equal outcomes—as illustrated by Rawls' influential theory of 'justice as fairness', in which fairness is ensured by a contract in which all are equal and ignorant of their position, but the outcome is not strict equality but the difference principle (Rawls 1999). It might be regrettable that we cannot save both parties, but it is preferable to toss a coin rather than save no one, and this is surely what both parties would agree to were we to consider their interests equally, thus I prefer to call this the fairest solution.

My understanding of fairness, as requiring equal consideration rather than equal satisfaction, seems to follow that of Kamm (1985; c.f. Broome 1998) and Beitz (1989, pp.99–107), who professes a debt to Scanlon. Nonetheless, though it might be considered 'contractualist', it should be noted that it differs from that of Scanlon, since he thinks unfairness can exist prior to contractualist reasoning and be reason to reject a principle (Scanlon 1998, pp.212, 216). Although my understanding of fairness is broader than Broome's, it remains distinct from all things considered moral rightness (Hooker 2005, pp.331–2), since it would not include moral reasons that are not owed to persons (Scanlon 1998, pp.171–8).

As I cannot, here, offer a full account of fairness, I attempt to describe my conclusions as neutrally as possible. On my understanding, fairness may require unequal chances (a weighted lottery)—and, once fair chances have been specified, distinct considerations of the good may also enter into our deliberations, effectively increasing some people's chances (without reducing anyone else's). My main concern, however, is the all things considered justification of weighted lotteries, not whether parts of the argument are best described as considerations of fairness alone or also of betterness.

4 Scanlon Against Weighted Lotteries

Even if we accept Scanlon's argument against equal chance procedures, it does not follow that we must save the greater number, for Scanlon accepts that weighted lotteries also allow each individual to make a difference (Scanlon 1998, pp.233–4). Scanlon therefore needs some independent argument against weighted lotteries, but unfortunately the criticism he offers is somewhat obscure. Scanlon suggests that it would not be reasonable to reject saving the greater number, because it is a better procedure than the weighted lottery. The present section will attempt to make sense of this argument and the next will argue that it is not necessarily good grounds for a wholesale rejection of weighted lotteries.

Although Scanlon recognizes that minorities have prudential grounds to favour any lottery, he claims that it would be unreasonable of them to insist on such. As he puts it, "There is no reason, at this point, to reshuffle the moral deck, by holding a weighted lottery, or an unweighted one" (Scanlon 1998, p.234). The argument seems puzzling, but I believe the 'reshuffling' metaphor is revealing and crucial to understanding Scanlon's thinking. A lottery is only *re*-shuffling the deck if it has already been shuffled to begin with. It seems that Scanlon prefers saving the greater number because he implicitly assumes that it is already a matter of chance who is in which group, making such a policy fair to everyone. We can see how important this assumption is if we make this prior randomization explicit, and compare it to cases where there is no such randomness.

5 Prior Randomization

Let us make explicit the assumption of prior randomization. Suppose that our lone individual, David, is on a ship with *A*, *B*, *C* and *D* when it breaks up in a storm. Four of them get to a lifeboat, while the other is left floating in the water. It is a matter of chance who ends up where—i.e. each of them had a roughly equal probability of being stranded on his own, as happened to David. In this case, we have four who will be saved and one who will not, but 'the greater number' does not pick out definite people *ex ante*, so it is reasonable to assume that all five would have agreed to a policy of saving the greater number beforehand. Each individual had a four in five chance of ending up in this larger group and thus an equal (four-fifths) chance of being saved. In this case, to hold a weighted lottery would not only be to "reshuffle the moral deck", but would diminish everyone's chances—to just 68% instead of 80%.[3] This means that all would reject the weighted lottery because it does not provide greatest equal chances—on some understandings, this is a violation of fairness (Hooker 2005, pp.340–1), while on Broome's this is, like saving no one, fair but supoptimal with respect to goodness. Saving the greater number increases everyone's *ex ante* chance of being saved, without being unfair to anyone. This makes sense of Scanlon's claim that it is a better procedure.

If this is the correct interpretation of Scanlon's argument, then it relies on the assumption of prior randomization. Now consider situations where this is not so: suppose that David goes to sea alone, while *A*, *B*, *C* and *D* are in the same waters together. Assume, further, that this a regular occurrence, so that who goes to sea alone is not itself a matter of prior randomization—for example, David is a fisherman who regularly undertakes such trips alone, while the other four are pleasure trippers who only go to sea together. There is no randomization in this case: David knows, when he goes to sea, that if both groups get into trouble he will be the one not saved. In this case, would it be unreasonable of him to object to the saving the greater number policy? There is no real sense in which he—as a concrete individual—has any chance of being in the greater number or being saved. He had a chance only if we appeal to something like an 'original position', in which his identity was unknown and he could have been one of *A*–*D* (Rawls 1999, pp.118–23).

It would seem that saving the greater number may be appropriate where there is some prior randomization, but there may still be a case for lotteries where those in the smaller group had no real chance of being in the larger group. Nonetheless, it would be very hard to specify the difference between cases in which prior randomization has taken place and those where it had not, which could lead to disputes. Although it may seem that, in particular cases, such as where David is a fisherman who regularly goes to sea alone,

[3] This is (chance of being in the four) x (chance of the four being rescued) + (chance of being the one) x (chance of the one being rescued), or 0.8x0.8+0.2x0.2 (Otsuka 2006, p.124).

randomization does not take place, we may say that, if we are deciding on a general policy, to govern all sorts of conflict cases arising in society, such inequalities are unlikely. David might know that he is more likely to be alone at sea, but this would not be the case when he needs rescue in other contexts—such as from a burning building or when needing scarce medical resources—so it may be in his overall long-run interest to agree to the general policy of saving the greater number. Perhaps this is why Scanlon prefers to focus on 'generic reasons' (Scanlon 1998, pp.206–13). Moreover, if contractors had to agree on a general policy that would apply to all conflict cases in their society then they might consider the incentive effects that such a policy would create, which may lead to more efficient use of life-saving resources.[4]

Perhaps it is unreasonable for any individual to reject saving the greater number as a general policy to govern all rescue cases that arise in society, for in the long-term they have no reason to suppose that they are more likely to be in one position rather than another, so they can effectively assume that randomization does take place. Now, however, let us return to Scanlon's rejection of equal chances.

6 Making a Difference Revisited

Recall that Scanlon thinks an individual in a larger group in need of rescue can reject an equal chance procedure because it allows rescuers to decide what to do as if they were not present. The present section argues that there is no notion of making a difference satisfied by saving the greater number that is not also satisfied by equal chances—thus, if Scanlon wants to maintain his objection to equal chances, he also has reason to prefer a weighted lottery to saving the greater number.

Scanlon accepts coin-tossing between two people's competing claims, but argues an extra person *C* could reasonably reject this as giving her no weight. Saving the greater number may appear to be responsive to each individual's claim, since we must count up those present in each group. In fact, though, it is still possible that individuals may make no difference to what we do. As we moved from a one against one conflict to a two against one conflict, the second individual's presence in the former group required us to save them rather than toss a coin. But, as we move from two against one to three against one, on the saving the greater number policy we decide what to do exactly as if this fourth individual had not been present. We might not consider this complaint too seriously, since the extra individual is still saved even if they do not make a difference, but there is a more serious difficulty. Now add an extra individual to the smaller group, so we have a three against two conflict: surely this individual can complain that he makes no difference; we save the three, whether there is one or two in the smaller group.

Scanlon could reply that being counted does not require that one changes the actual outcome of the procedure, only how one decides what to do. It seems to be a counterfactual notion: had matters been otherwise, one *could* have made a difference. But, if this is all it means to make a difference, it is not obvious that Scanlon can reject equal chances. If the difference need only be hypothetical, the rescuer in our original (two against one) case can respond that though *C* has not made a difference as things stand, had matters been otherwise she would have done so. That is, she made no difference because she is alongside another person and so already entitled to an equal chance; but had there not been someone else already there her presence would have obliged the rescuer to toss a coin. It seems that

[4] I owe this point to Adam Swift.

the equal chances procedure can claim that each person's presence makes a difference in the same, admittedly hypothetical, way as they do under the saving the greater number policy, so Scanlon has no obvious grounds to reject equal chances.

One possible solution is to adopt a more robust notion of making a difference. This would give us reason to favour the weighted lottery, according to which each extra individual influences the chances of their group being saved. As we move from one against one to two against one, we alter the chances from 50/50 to 67/33. Adding an extra individual to the larger group further increases their chances, now to 75/25, and adding another to the smaller group also has an effect, this time making the chances 60/40. Some simple algebra will prove that this point generalizes—an extra individual on either side always increases the chances of that sub-group being saved (the following formal proof can be skipped if the point is obvious).[5] Assume the group G of n individuals ($n \geq 2$) is exhaustively divided into two sub-groups, G_1 of k individuals ($k<n$) and G_2 of n-k individuals. The probability of saving G_1, following a proportionately weighted lottery, will be k/n. Adding an extra individual to G_1, whilst keeping G_2 constant, increases the probability to $(k+1)/(n+1)$. We can show that $(k+1)/(n+1) > k/n$ as follows:

$$
\begin{array}{ll}
\text{Multiply each side by } (n+1): & k+1 > k(n+1)/n \\
\text{Multiply each side by } n: & n(k+1) > k(n+1) \\
\text{Rearrange}: & kn+n > kn+k \\
\text{Cancel } kn \text{ from each side}: & n > k \text{(as stipulated)}
\end{array}
$$

Since no assumption was made about which group is larger, this proof will work for both G_1 and G_2. Note that each individual, as added one-by-one, makes a difference, but adding a number of individuals may make no net difference if the ratios between G_1 and G_2 are maintained; for instance if we go from two against one to four against two then there will be no difference in the end. Moreover, each time we add an extra individual, the difference they make is less, but this is simply because chances are divided between more people—just as, when a pie is shared between more people, all get smaller slices. Nonetheless, each person makes an equal contribution to the chances of their group being saved. In particular, when we add an extra person to the larger group, she increases their already greater chances of being saved. As noted earlier, she may have preferred to have not made a difference but to have been automatically saved. Scanlon, however, famously argued that our claims on others need not reflect our subjective preferences (Scanlon 1975).

7 Further Arguments Against Weighted Lotteries

I have argued that Scanlon's treatment of the numbers problem is not generally successful. However, weighted lotteries have more recently been defended by Timmermann (2004) and criticized by Hirose (2007). Hirose's first criticism is against the rationale for distributing chances; arguing that we should not be distributing chances anyway, but the good of being saved. As for Kamm's Procedure of Proportional Chances (PPC), Hirose has two objections: firstly, that one must either waste chance or end up with equal chances and, secondly, that analogous logic could produce what he calls an 'inverse lottery'. I begin by defending the general strategy of dividing chances in this section, before turning to

[5] I thank Rainer Trapp for prompting this formalization.

defending the PPC against Hirose's two critiques of proportional chances and, in the process, developing a new argument for weighted lotteries in the remainder of this article.

Hirose begins his attack by questioning any procedures that involve distributing chances. He suggests that what we should be concerned with distributing is the good of being saved, rather than chances. Hirose argues that, *if* tossing a coin was sufficient to show equal concern to each person, then when we had two loaves of bread and two hungry people it would still be fair to toss one coin to decide who should get both loaves, even though intuitively we would regard it as fairer to give each person one loaf. (Note that, according to Broome's theory, fairness requires proportional satisfaction and a lottery represents a compromise of fairness for the sake of satisfying more claims.) Hirose concludes that we should focus on the distribution of goods rather than chances. Separating the fairness of procedures from the fairness of outcomes in this way is, however, artificial; when we are trying to choose between any two fair procedures, it makes sense to consider their likely outcomes and this is part of considering the procedures (Rawls 1999, pp.73–7).

Tossing one coin to see who gets both loaves does indeed respect both claimants equally, in the sense that each has an equal (50%) chance of getting both loaves. It also, however, guarantees an unfair outcome, since one claimant will get two loaves and the other none. We could, alternatively, have tossed a separate coin for each loaf. This is also procedurally fair, but also increases the chances of one loaf going to each person (with is now a 50% probability) and so can be called fairer all things considered. Alternatively, we could raffle the two loaves of bread—putting the names of the two claimants into a hat and drawing them out to see who gets each loaf. This distributes the first loaf randomly but, once we have drawn one person's name out for the first loaf, there is no need to replace it in the hat for the second draw, since the two are no longer equal claimants—thus the second loaf will necessarily go to the second person and a fair distribution (one loaf each) is guaranteed.

Each of the three procedures—tossing one coin for both loaves; one coin for each loaf; or a raffle—satisfies abstract procedural fairness (equal treatment of each person), but the latter realizes fairer substantive outcomes (one loaf each). We may describe this either as the best fair procedure (where the value of the outcomes is understood independently of fairness) or the fairest procedure overall (where fairness includes procedural and outcome considerations). We can usually assume that both parties would prefer such a procedure *ex ante* to tossing a single coin for the chance of having both loaves, which would be reasonably rejectable because it would leave one claimant with nothing. However, if each party (from a self-interested point of view) would rather have a 50% chance of having both goods to the guarantee of having one of them, then I suggest we should consider that the fairest option. For present purposes though, what matters is that a lottery may be fairest where there is an indivisible good.

In these cases, we are really concerned with the good itself, not merely the chance for it, but a distributive principle does not have to focus only on what ultimately matters. Many egalitarians focus on distributions of resources (e.g. Rawls 1999, pp.78–81), even while admitting that it is welfare that ultimately matters to people. Similarly, distributors often turn to distributing chances where they cannot divide the good itself, without denying that it is the good that ultimately matters. As we have seen, members of the larger group may prefer a policy of saving the greater number to one that counts each person's presence, since it will mean that they are definitely saved, but this strategic preference is no basis for a reasonable rejection of weighted lotteries. Moreover, we need principles that are acceptable to members of both the larger and smaller group. Thus, there does not seem to be anything wrong in general with principles that distribute *chances* of goods, rather than the goods themselves. Even though what ultimately matters is being saved, it seems natural to focus on distributing chances in cases of conflicting claims, and there is no reason to suppose that this is unfair. I shall now turn to how those chances are to be distributed; beginning with what Hirose calls the General Weighted Lottery (GWL).

8 General Weighted Lotteries

Hirose defines the GWL as any randomizing procedure that gives the larger group of people a strictly greater chance of being saved. As the name implies, this is a more general version of the particular variant, the Procedure of Proportional Chances (PPC) that is examined below. Because it is hard to find any rationale for a non-proportional distribution, most defences of weighted lotteries focus on the PPC. Nonetheless, since some reason may be offered, it makes sense to begin by asking whether chances should be weighted *at all*, before turning to whether they should be weighted in proportion to the numbers in each group. (Indeed, it should be noted that my argument for weighted lotteries is not necessarily one for proportional lotteries.)

The previous section defended the distribution of *chances* generally, but Hirose has another criticism of GWLs, which distribute said chances unequally, objecting that we run the risk that the smaller group will win—and, in extreme cases, we might save one person rather than a million (Hirose 2007, p.55; c.f. Sanders 1988, pp.3–4; Lawlor 2006, p.162). This, however, is a problem—if at all—for any lottery, not only for weighted ones, which in fact reduce the likelihood of smaller groups winning. However, what is presented as a criticism is precisely what advocates of the weighted lottery propose: that the smaller group should get a chance. There seems nothing wrong with holding that this is a requirement of *fairness*, since either one shares Taurek's scepticism about 'impersonal betterness' (Taurek 1977, pp.304–5), in which case one can simply deny Hirose's charge that it leads to worse outcomes, or one does not, in which case one can simply say that the claims of fairness can be overridden by the greater good of saving the greater number (Hirose 2004; Lawlor 2006).

While no positive argument has yet been given for weighted lotteries, if the objections to such proposals can be defeated then existing arguments (e.g. Timmermann 2004) still stand. Moreover, my responses to Hirose's objections point to a new argument for weighted lotteries.

9 Hirose Against the Procedure of Proportional Chances

While advocates of the GWL can logically distribute chances as they like, chances proportional to numbers (i.e. PPC) seems to be the most obvious strategy. Hirose raises two further objections against such proposals:

(1) Equal baseline chances cannot be pooled, for then claimants no longer have equal chances of being saved. To use Hirose's example, where we can save either *A* alone or *B&C* together, then to divide the chances 1/3 and 2/3 is not to give *A* something equal to what *B&C* get. If we want to give each person a 1/3 chance, then we should not allow them to combine those chances. Thus, it is justified to give each person a 1/3 chance, and save either *A*, *B* or *C*, but not more than one of them. Since *B&C* could be saved together, one could give them the same one-third chance, such that one saves *A* (with one-third probability), *B&C* together (with one-third probability) or no one (with one-third probability). Hirose criticizes this as 'wasteful', and argues that one should give maximum equal chances, thereby reaching a 50% chance for each group. Thus, if

we do not want to gratuitously 'waste' chance, when we could save someone, we end up back at Taurek's proposal of equal chances for each group.

(2) Hirose's second objection to Timmermann's argument for the PPC is that if we focus on who is *not* saved—the distribution of bad rather than good—then we get an 'inverse lottery'. Where the rescuer knows that she cannot save everyone, she may use a lottery to make the horrific choice of who not to save. In this case, if claims could be combined, drawing *B* as not-to-be saved would force us not to save *C* either (for if we went that way, we would have to save both). Thus, we would end up with a 2/3 chance of saving *A* and a 1/3 chance of saving *B&C*—an inversely weighted lottery. Obviously, this is not something that anyone would want to endorse, but Hirose's point is that there is no principled reason to focus on who should be saved rather than who should not be; thus arguments such as those of Timmermann (2004) give no reason to prefer a proportionately weighted lottery to an inversely weighted lottery.

These two arguments seem to provide a powerful case against weighted lotteries, but in fact they cannot coherently be combined together. Note that the second criticism assumes what the first rejects, namely the pooling of baseline chances. Thus, what Hirose really offers is not two separate arguments, but a dilemma—if pooling is allowed, then one may end up with inverse lotteries but, if not, then one only gets equal chance lotteries rather than weighted lotteries. Advocates of weighted lotteries can, I will argue, avoid this dilemma by playing one horn off against the other. If we focus on distributing the bad, without pooling, then we reach an unequal distribution of odds that, as I will later explain, is still 'perfectly fair'. Further, if we accept that the good of saving more people gives us reason to do so where it does no harm to anyone else, we can reach a result which may be extensionally equivalent to the PPC. (The case below is one where the result happens to be proportional; it does not matter to my claims whether this is always so.) Note that this multi-stage lottery is *not* intended as a decision procedure. Rather, showing that a more complicated fair procedure has the same results as a weighted lottery suggests that we might as well adopt such a procedure directly.

10 Two Stage Lotteries

If we do not assume the pooling of chances (i.e. that *B* and *C* must be saved or left together) from the start, then—contrary to the second objection—we do not get an inverse lottery by focusing on who not to save. Instead, having picked *B* as not-to-be-saved, we still face a choice between *A* and *C*. Then we must flip a coin between *A*-alone and *C*-alone. On this view, we can save *C*-alone, as *B* has already been considered, and lost in the lottery. I shall come back later to whether we should save *C*-alone, when we could also save *B*. For now, the two-stage lottery can be represented by a decision-tree (Fig. 1).

If we draw *B*, and then *C*, as not to be saved (the path marked in bold on Fig. 1), then we save *A*. The likelihood of this is one-sixth (i.e. the one-third probability of drawing *B*

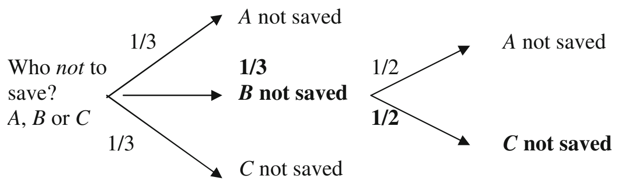

Fig. 1 Partial decision tree

multiplied by the one-half probability of then drawing *C*). If we draw *B*, and then *A*, not to be saved, the outcome is that we save *C-alone*, again with one-sixth probability. There are six possible combinations—numbers 3 and 4 being those completely shown in Fig. 1, above (Fig. 2).

Each of these six possibilities is equally likely, with probability one-sixth (i.e. one-third times one-half). As each person can be saved by two possible combinations (e.g. *A* is saved by not-*B*, then not-*C* *or* not-*C*, then not-*B*), each person has a one-in-three chance of being saved somehow. This is the result of them not-losing the first draw (two-thirds) and then, if they got this far, not losing the second (one-half). By abandoning the requirement that *B* and *C* are saved or left together, we get back to the situation suggested in the first objection, whereby each of the three gets a one-third chance. This is unobjectionably fair, even on Broome's account, but may be wasteful, as *B* may be saved without *C*, and vice versa.

11 Fairness Refined

We can refine the outcome of the previous section slightly, however. Suppose that the first draw results in *A* selected as not to be saved. Now there is no longer a conflict, since only *B* and *C* remain and it is possible to save them together, so a second draw is unnecessary. If we dispense with this, then there is a one-third probability of saving *B&C* together (i.e. the one-third probability that *A* is chosen first). If *B* is drawn in the first lottery (one-third probability), however, we still must choose between *A* or *C*-alone (each one-sixth probability). Similarly, if *C* is drawn in the first lottery, then we must choose between *A* or *B*-alone (again with one-sixth probability of each). The result is a two-sixths (or one-third) chance of saving *A*, a one-third chance of saving *B&C* together, and one-sixth chances of saving each of *B* and *C* alone (Fig. 3).

By this reasoning, *B* and *C* each have a one-half chance of being saved, though not necessarily together. There is also a one-third chance of waste (saving either *B* or *C* alone, when one could have saved both had it not been for the draw). This, I maintain (*pace* Broome) is *perfectly fair*. Although *B* and *C* have larger *de facto* chances of survival, each person is given equal consideration and *A* has no ground for complaint: she was merely unlucky that she was first drawn as the one not to survive. Each person is respected equally so no one has grounds for complaint.

The insight is the familiar one that equal consideration of all claims need not lead to equal outcomes—as Rawls' 'justice as fairness' (Rawls 1999) prefers Pareto-improving inequalities to equality at a lower level, or Beitz argues that political equality need not require equal votes (Beitz 1989, pp.93–4). Similarly here, to reduce *B* and *C*'s chances now would not benefit *A*, but would simply be a case of levelling down (Parfit 1997). Thus, fairness—the equal consideration of all individuals—is satisfied by a lottery over the four

Possible combination	Loser of first draw	Loser of second draw	Who is saved
1	*A*	*B*	*C*
2	*A*	*C*	*B*
3	*B*	*A*	*C*
4	*B*	*C*	*A*
5	*C*	*A*	*B*
6	*C*	*B*	*A*

Fig. 2 Results of two draws

Chance	Draw 1	Draw 2	Outcome (saved)
1/3	*A* (not saved)	(not needed)	*B*-and-*C*
1/6	*B* (not saved)	*A* (not saved)	*C*-alone
1/6	*B* (not saved)	*C* (not saved)	*A*
1/6	*C* (not saved)	*A* (not saved)	*B*-alone
1/6	*C* (not saved)	*B* (not saved)	*A*

Fig. 3 Second draw not needed

alternatives: saving *A* (probability one-third), saving *B*&*C* (probability one-third), saving *B*-alone (probability one-sixth), and saving *C*-alone (probability one-sixth). This shows, contrary to Hirose's first objection, that fairness does not require that persons have equal *de facto* chances of being saved after all. Rather, because each counts equally, more count for more (Parfit 1978, p.301), yet we do not let utilitarian calculations dictate our response—the separateness of persons obliges us to give each individual a chance of rescue.

12 Bringing Betterness Back In

It can still be objected that this fair procedure is wasteful. There is a one-in-three chance of saving either *B* or *C* alone, when we could do better by saving both. In these cases, however, I think that it *would* be permissible, all things considered, to save the extra person, even though the lottery had initially selected them as 'not to be saved'. This can be understood either as concern for a better outcome justifying some unfairness, as Broome or Hirose might say, or as a consequence of fairness demanding maximal satisfaction where there is no longer a conflict, as Hooker suggests.

In the life-saving case we have just considered, we may be able to do more good without objectionably compromising fairness. The lottery was only introduced because we faced the tough decision of having to abandon one or more. If it is now possible to save an extra person, who we were previously forced to abandon, then it would be fetishistic to leave them anyway, simply because we had earlier selected that course of action when we could not save them too. If *A* were to suddenly teleport to join *B* and *C*, we would not abandon her anyway. Likewise, although we had been prepared to abandon *B*, we should not do so gratuitously, when we can save him at little cost while rescuing *C*. Thus, if our lottery indicates that we should save *B* or *C* alone, then we should actually save them both. Thus, *we are effectively back to the original weighted (in this case, proportional) lottery*: there is a two-thirds chance of saving *B*&*C*, and a one-third chance of saving *A*. We are paying heed to the goodness of outcomes as well as fairness but there is no unfairness, for *A* is not made worse off. Note that the decision to save *B* and *C* is a Pareto improvement over saving only one of them and *A* cannot complain as her one-third chance is not affected, whether we save *B*-alone or *B*&*C*. Thus, it appears that the first objection to weighted lotteries has defeated the second and that we have re-constructed a case for them, as a practical equivalent of two-stage lottery draws.

13 Conclusion

My aim has been to defend weighted lotteries against the objections raised by Scanlon and Hirose. I have suggested that fairness should be understood as equal consideration of claims, but not necessarily their equal satisfaction. Consequently, procedures that result in differential chances for each group need not be unfair, as shown by the two stage lottery concerning whom not to save. Moreover, I have suggested that, once we acknowledge that fairness need not require equal chances, we can further improve everyone's chances by saving all those with whoever we are to save. Thus, considerations of betterness come in to increase people's chances, but only provided they do not reduce anyone else's fair chance. Weighted lotteries thus reflect both considerations of fairness (all get a chance) and the good of saving more people. Numbers do indeed count, since the larger group gets a greater chance, but the numbers do not determine what we ought to do (as utilitarians would have it), because we must also be fair to the smaller group. Maybe further arguments can be found against weighted lotteries, but for now they remain a live solution to the numbers problem.

Acknowledgements Some of the ideas in this paper were first developed, in a different context, as part of my doctoral dissertation. Among the many debts incurred during that time, I must thank the supervision of David Miller, funding from the Arts and Humanities Research Council (UK), my examiners, Adam Swift and David Estlund, and participants in the Oxford Moral Philosophy Seminar (2nd June 2008), particularly John Broome.
My criticisms of Hirose were first aired at the Oxford University Centre for Ethics and Legal Philosophy workshop on Aggregation and Numbers (5th February 2005) and I thank the participants there for lively discussion. Finally, for further helpful comments on this paper, I thank Daan Evers, Johann Frick, Iwao Hirose, Toby Ord, Gerard Vong, and two anonymous referees for the journal.

References

Beitz C (1989) Political Equality. Princeton, Princeton University Press
Broome J (1984) Selecting people randomly. Ethics 95:38–55 doi:10.1086/292596
Broome J (1990) Fairness. Proc Aristot Soc 91:87–101 http://www.jstor.org/stable/4545128
Broome J (1998) Kamm on fairness. Philos Phenomenol Res 58:955–961 doi:10.2307/2653739
Crowder G (2002) Liberalism and value pluralism. Continuum, London
Hirose I (2004) Aggregation and numbers. Utilitas 16:62–79 doi:10.1017/S0953820803001067
Hirose I (2007) Weighted lotteries in life and death cases. Ratio 20:45–56 doi:10.1111/j.1467-9329.2007.00345.x
Hooker B (2005) Fairness. Ethical Theory Moral Pract 8:329–352 doi:10.1007/s10677-005-8836-2
Kamm F (1985) Equal treatment and equal chances. Philos Public Aff 14:177–194 http://www.jstor.org/stable/2265456
Kavka G (1979) The numbers should count. Philos Stud 36:285–294 doi:10.1007/BF00372632
Lawlor R (2006) Taurek, numbers and probabilities. Ethical Theory Moral Pract 9:149–166 doi:10.1007/s10677-005-9004-4
Otsuka M (2006) Saving lives, moral theory, and the claims of individuals. Philos Public Aff 34:109–135 doi:10.1111/j.1088-4963.2006.00058.x
Parfit D (1978) Innumerate ethics. Philos Public Aff 7:285–301 http://www.jstor.org/stable/2264959
Parfit D (1997) Equality and priority. Ratio 10:202–211 doi:10.1111/1467-9329.00041
Rawls J (1999) A theory of justice, revised edition. Harvard University Press, Cambridge MA
Sanders J (1988) Why the numbers should sometimes count. Philos Public Aff 17:3–14 http://www.jstor.org/stable/2265283
Saunders B (2008) The equality of lotteries. Philos 83:359–372 doi:10.1017/S0031819108000727
Scanlon T (1975) Preference and urgency. J Philos 72:655–669 doi:10.2307/2024630
Scanlon T (1998) What we owe to each other. Harvard University Press, Cambridge MA
Stone P (2007) Why lotteries are just. J Polit Philos 15:276–295 doi:10.1111/j.1467-9760.2006.00274.x
Taurek J (1977) Should the numbers count? Philos Public Aff 6:293–316 http://www.jstor.org/stable/2264945
Timmermann J (2004) The individualist lottery: how people count, but not their numbers. Analysis 64:106–112 doi:10.1111/j.1467-8284.2004.00468.x