

Equality, Efficiency, and the Priority of the Worse Off

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1. Introduction

Egalitarian theories of justice hold that equality should be promoted. Typically, perfect equality will not be achievable, and it will be necessary to determine which of various unequal distributions is the most equal. All plausible conceptions of equality hold that, where perfect equality does not obtain, (1) any benefit (no matter how small) to a worst off person that leaves him/her still a worst off person has priority (with respect to equality promotion) over any benefit (no matter how large) to a best off person, and (2) any benefit to a worse off person (even if not a worst off person) has priority over a benefit of the same size to a better off person (even if not a best off person). Beyond that there is much disagreement.

I shall defend two further conditions of adequacy for the assessment of equality for the purposes of egalitarian justice. One holds that any benefit (no matter how small) to a person who remains below the mean after the benefit is given takes absolute priority (with respect to equality promotion) over any benefit (no matter how large) to a person above the mean. Thus, like leximin, this condition gives absolute priority to a specified group of worse off people. Unlike leximin, however, the worst off individuals are not given absolute priority over all better off persons. Instead, individuals below the mean are given absolute priority over individuals above the mean. The second condition holds that when only individuals below the mean are affected, and the total number of individuals is constant, benefits should be distributed so as to maximize the total benefit. Thus, like utilitarianism, this condition takes efficiency to be paramount when distributing benefits among individuals below the mean. Unlike utilitarianism, however, this condition is silent about the provision of benefits to individuals above the mean.

I show that these two conditions are compatible with the uncontroversial core conditions on equality as well as with many standard additional conditions.

2. Background on Equality and Justice

I shall be defending a way of assessing equality as relevant for justice. I shall not address the question of what the appropriate equalisandum is. I would defend some form of equality of opportunity for welfare, but in the present paper I will leave open what the equalisandum is and write simply of benefits.¹

Throughout, I shall assume that benefits are cardinally measurable and fully interpersonal comparable. I doubt that this is strictly so for a plausible account of the individual good (e.g., welfare), but the main ideas remain valid (although with more limited scope) to the extent that all admissible ways of measuring benefits yield the same results. I am untroubled by the incompleteness and indeterminacy that this might generate, since I think morality is incomplete and indeterminate in various ways. But in any case, in the present paper I will simply explore some issues on the assumption of cardinal measurability with full comparability.

Justice requires equality promotion. I do not claim—indeed, I deny—that the promotion of equality is the only demand that justice makes. Respect for certain rights (e.g., self-ownership) and benefit promotion (e.g., Pareto optimality) are, I hold, each independent and fundamental demands of justice as well. It is unjust to promote equality when the only way of doing so is by harming innocent people in various ways (e.g., by torturing them). And it is just to promote inequality in non-harmful ways when it benefits individuals below the mean appropriately (e.g., makes them appropriately better off than under maximal equality; e.g., $\langle 4, 2 \rangle$ instead of $\langle 1, 1 \rangle$).² A plausible theory of justice, I claim, must be pluralistic in that, in addition to the demands of equality, it must recognize individual rights (constraining the promotion of equality) and benefit

promotion (calling for the promotion of inequality when it suitably benefits the members of society) as fundamental independent moral demands.

Let us now turn to the measurement of equality.

3. The Concept of Equality

There are many measures of equality that have been developed and defended.³ All the main contenders share an agreed upon core (the concept of equality), but differ on various specifics. The assessment of these different conceptions is not (in general) a conceptual or mathematical matter, but rather a normative matter of what the relevant measure is for the matter at hand. Our focus is on egalitarian theories of justice, and so we are concerned with conceptions of equality that are relevant for such theories.

All conceptions of equality suitable for a plausible egalitarian theory of justice hold that the equality-ranking relation (of distributions of ultimate benefits) satisfies certain formal conditions. They hold that the ranking relation is anonymous (i.e., unaffected by permutations of benefits among the recipients, i.e., determined by the pattern only and not on who gets what). They also hold that the relation of (one distribution) being-at-least-as-equal as (another distribution) is transitive and reflexive, and that the relation of being-more-equal-than is transitive and asymmetric. These conditions will be assumed throughout. No assumption will be made, however, that the relation of being-at-least-as-equal-as is complete, or that it is representable by a continuous function. These are much more controversial conditions.

All conceptions of equality suitable for a plausible egalitarian theory of justice also hold that that equality-ranking relation satisfies the following more substantive conditions. For brevity, let us say that a transfer of benefits from one person to another is non-reversing if and only if it does not reverse their order in terms of benefit levels (i.e., it makes no change in their order, or it

changes them from unequal to equal benefits). We assume throughout that there are at least two people. The relatively uncontroversial conditions are the following. (Throughout the statement of conditions assumes no changes except those mentioned.)

Perfect Equality: Perfect equality obtains when everyone has the same benefit level.

Pigou-Dalton: If the total amount of benefits remains constant, then equality is increased by any non-reversing transfer of benefits (without loss or gain) from one person to a worse off person.⁴

Conditional Contracting Extremes: If there is no absolute zero for benefits, or if there is and benefits are all positive, or are all negative⁵, then equality is increased by (1) any decrease in the benefits of a best off person that leaves him/her still a best off person, and by (2) any increase in the benefits of a worst off person that leaves him still a worst off person.

I shall assume these conditions throughout. The first condition simply states the obvious condition for perfect equality. The remaining two conditions require that equality is increased whenever the distribution of benefits is altered in certain ways. Pigou-Dalton ensures that equality is increased when a benefit is taken from a better off person and non-reversingly transferred to a worse off person (e.g., $\langle 3,4,1 \rangle$ is more equal than $\langle 2,5,1 \rangle$). This ensures that at least some priority is given to worse off people.⁶ Conditional Contracting Extremes ensures that, where there is no absolute zero or all benefit levels are positive or all are negative, equality is increased when a best off person is made worse off without ceasing to be a best off person (e.g., $\langle 2,4 \rangle$ is more equal than $\langle 2,5 \rangle$), or a worst off person is made better off without ceasing to be a worst off person (e.g. $\langle 2,4 \rangle$ is more equal than $\langle 1,4 \rangle$).

The question on which I'll focus is this: Under what conditions is equality increased by reducing the benefit to a better off person, and increasing the benefit (not necessarily by the same amount) to a worse off person? Following Temkin (1993, p.77) let us say that a transfer between two people is even if and only if the benefit gained by one is equal in magnitude to the benefit lost by the other (e.g., reducing one person by 1 unit and increasing another by 1 unit). And let us say that a transfer is efficient (inefficient) if and only if the benefit gained by one is greater (less) than the benefit lost by the other (e.g., reducing one person by 2 (4) and increasing another by 3).⁷ For generality, we'll understand efficient transfers to include hyperefficient transfers, where these are "transfers" that provide a benefit to one person at no cost to anyone else. And we'll understand inefficient transfers to include hyperinefficient transfers, where these are "transfers" that reduce the benefit of one person, and provide no benefit to anyone else. Strictly speaking, these involve no transfer, but because they are the limiting cases of efficiency and inefficiency in transfers, it will be useful to count them as such.⁸

The above conditions have four implications worth considering here, assuming that there is no absolute zero for benefits, or there is and all benefit levels are positive or all are negative. Pigou-Dalton requires that (1) equality is increased by a non-reversing even transfer from a better off person to a worse off person. Conditional Contracting Extremes requires that (2) equality is increased by any transfer (even, efficient, or inefficient) from a best off person to a worst off person that does not alter their status as best off and worst off. In conjunction with Pigou-Dalton, Conditional Contracting Extremes further entails that: (3) equality is increased by any inefficient transfer from a best off person to a worse off person that does not alter the status of the best off person (proof: an even transfer to the worse off person increases equality by Pigou Dalton Transfer, and the net loss of benefits to the best off from the inefficiency further increases equality by Conditional Contracting Extremes); and (4) equality is increased by any efficient transfer from a

better off person to a worst off person that does not alter the status of the worst off (proof: an even transfer to the worst off person increases equality by Pigou Dalton Transfer, and then the net gain of benefits to the worst off from the efficiency further increases equality by Conditional Contracting Extremes).

This leaves open the impact on equality of two relevant sorts of non-reversing transfers to worse off people: efficient transfers to people who are not the worst off, and inefficient transfers from people who are not the best off. I shall argue that whether such transfers increase equality depends on whether the recipients have less than the mean.

4. Efficiency vs. the Priority of the Worse Off

The above three conditions on equality leave open the impact on equality of non-even transfers that are not from the best off or to the worst off. This is because the conditions do not specify how much priority (extra weight) the benefits to worse off people should have (with respect to equality promotion). I shall defend a view that holds this priority is infinite or absolute when one person is above the mean and the other is below the mean, but that the priority is only infinitesimal or minimal when both people are below the mean. It should be emphasized that I will defend these claims as plausible conditions on equality for an egalitarian theory of justice, and not for measures of equality in general (no matter what the application).⁹

For brevity, understand a status-maintaining transfer between two people to be a transfer that does not move either from being above the mean to being below the mean, or vice versa.¹⁰

The two conditions I shall defend are:

Absolute Priority of those below the mean: Equality is increased by any status-maintaining transfer from a person above the mean to a person below the mean.¹¹

Efficiency Below the mean: Equality is increased by any efficient status-maintaining transfer from a person below the mean to another person below the mean.

Like leximin, Absolute Priority gives absolute priority to a specified group of worse off people. Unlike leximin, however, the worst off individuals are not given absolute priority over all better off persons. Instead, individuals below the mean are given absolute priority over individuals above the mean. Efficiency Below holds that when only individuals below the mean are affected, and the total number of individuals is constant, benefits should be distributed so as to maximize the total benefit. Thus, like utilitarianism, this condition takes efficiency to be paramount when distributing benefits among individuals below the mean. Unlike utilitarianism, however, this condition is silent about the provision of benefits to individuals above the mean.

The conjunction of Absolute Priority and Efficiency Below is very similar to Rawls's original idea for leximin. For Rawls advocated (although this is usually forgotten) leximin as applied to the worst off group, and held that some sort of aggregation must take place within the worst off group. He suggested that the worst off group might be taken as those with half the median income and wealth, and suggested that aggregation by averaging might be appropriate. Although Rawls would have rejected the mean as the relevant cutoff point for defining the worst off group, he would have endorsed the above two conditions with the reference to the mean replaced by reference to the appropriately defined worst off group.¹²

My defense of these two principles assumes that the assessment of equality is based on two sorts of considerations: fair share complaints and envy complaints. A fair share complaint for a given person is some measure of the extent to which he/she gets less than his/her fair share, which—since we are concerned with equality—is an equal share of the total benefits. Those with

at least their fair share have no fair share complaints. An envy complaint for a given person is some measure of the extent to which he/she gets less than others do. Even those who have more than their fair share have envy complaints if they are not a best off person. Equality promotion, I assume, is concerned with reducing both sorts of complaint.¹³ I further assume that, in assessing the relative equality of two distributions, the reduction of fair share complaints is lexically prior to the reduction of envy complaints. Envy complaints, that is, are relevant, but only as tie-breakers among distributions that are equivalent with respect to fair share complaints. This is not an uncontroversial view, but I shall assume it in what follows.

Absolute Priority is the less controversial of the two conditions. It holds that any status-maintaining benefit to a person below the mean has priority over any benefit, no matter how large, to a person above the mean. This claim is much weaker than the implausible, and extremely strong, claim (of leximin) that any worse off person has absolute priority over any better off person. This stronger idea is implausible, since a much larger benefit to a slightly better off, but still poorly off, person (or group of persons) may better promote equality. By contrast, the implication in question only asserts absolute priority in those cases where the better off person is above the mean and the worse off person is below the mean. This is plausible because individuals above the mean have no fair share claim to their benefits in excess of the mean, and individuals below the mean do have a fair share claim to those benefits. There are (as we shall see) different ways of measuring and dealing with fair share complaints, but any plausible approach will hold that aggregate fair share complaint is reduced by status-maintaining transfers from those above the mean to those below the mean. And if, as I claim, dealing with fair share complaints is lexically prior to dealing with envy complaints, then it follows that equality is promoted by such transfers.

A main objection to Absolute Priority concerns the crucial role of the mean. Why should the cutoff for the group to be favored be the mean, as opposed to the median, 50% of the median, or some independently defined poverty line? After all, one can grant that absolute priority should be given to people below some cutoff line, and also insist upon efficiency below the line without holding that the relevant line is the mean. The answer, of course, is that equality is a relevant concern of justice only in a context where everyone is equally deserving (e.g., basic life opportunities). In such a context a person's fair share is an equal share, and that is equal to the mean. And if, as I have claimed, dealing with fair share complaints is lexically prior to dealing with envy complaints, then the mean will play an absolutely pivotal role.

Another objection to Absolute Priority is that it violates the following often-endorsed condition:

Proportionate Increases Invariance: Equality is unaffected by multiplying each person's benefits by the same positive factor.

The root idea underlying this condition is that equality is a relative matter and depends on proportionate shares rather than on the benefit levels themselves. Thus, $\langle 1, 2 \rangle$ is viewed as just as equal as $\langle 10, 20 \rangle$ (since in both cases the first person has half of what the other person has). This condition is rejected by those who view equality as an absolute matter. They would claim, for example, that the latter distribution is less equal, since there is a gap of 10 units rather than of only 1 unit.

Absolute Priority is incompatible with Proportionate Increases Invariance. For the latter holds that $\langle 0, 1 \rangle$ is equally equal as $\langle 0, 1000 \rangle$, whereas Absolute Priority holds that the first is more equal (since it can be obtained from the latter by a hyperinefficient status-maintaining

transfer from someone above the mean (take 999 from the 1000) to someone below the mean (give 0 to the 0).

Proportionate Increases Invariance is not, however, a plausible condition. First, if there is no natural zero, then proportionate increases are ill defined (the impact will depend on what is taken as the zero point). Second, if there is a natural zero and there are both positive and negative benefits, then the condition leads to clearly unacceptable results. For it holds that $\langle -1, 2 \rangle$ is just as equal as $\langle -1M, 2M \rangle$. Making the worst off person much worse and the best off person much better off surely reduces equality. So this condition is implausible where there are both positive and negative benefits. Finally, but more controversially, the condition gives implausible results in cases where some people's benefits are zero. For, as indicated above, it holds that $\langle 0, 1 \rangle$ is just as equal as $\langle 0, 1000 \rangle$, but this, I claim, is implausible (for an egalitarian theory of justice).

Increasing the benefits of best off person with no change elsewhere decreases equality in the relevant sense.

I am not here arguing against all relative views of equality. I am only claiming that the above condition is implausible in cases where there are both positive and non-positive, or negative and non-negative, benefits. In the next section I will show that Absolute Priority is compatible with a weakening of the above condition so that it applies only where all benefits are positive, or all are negative.

Consider now Efficiency Below, which is much more controversial. It claims that equality is increased by any status-maintaining efficient transfer from one person below the mean to another person below. Since, an inefficient transfer is just an efficient one in reverse, this is equivalent to claiming that equality is decreased by any status-maintaining inefficient transfer from one person below the mean to another below the mean. Surely, it will be claimed against Efficiency Below, equality is increased—and not decreased—when the transfer is non-reversingly from a better off

person to a worse off person (both below the mean), and the inefficiency is only slight. This is the core objection to Efficiency Below, and we must address it carefully.

This objection concerns Efficiency Below's focus on the total benefits to individuals below the mean, and its insensitivity to how benefits are distributed among them. This objection does not, however, deny that the extra priority for the worse off can sometimes be outweighed by considerations of efficiency. All plausible conceptions of equality (pace leximin conceptions) grant that the extra priority is at most finite, and thus at least sometimes is outweighed by greater benefits to other better off individuals below the mean. Gross inefficiency in transfers (e.g., a small benefit given to a few, big benefits taken from many more) among individuals below the mean, it would be generally agreed, decreases equality. The same is true, I claim, of moderate inefficiency (e.g., benefits given to a certain number of people, moderately larger benefits taken from moderately more people) in such transfers. A plausible egalitarian theory will, I claim, not favor such transfers. It will be tough-minded and mandate that the group of individuals below the mean be helped as much as possible.

The difficult case concerns slight inefficiency in transfers (e.g., benefits given to a certain number of people, and slightly larger benefits taken from slightly more people). Efficiency Below takes a radical view and holds that any inefficiency in transfers among individuals below the mean decreases equality. The intuitions of most egalitarians will hold, it must be admitted, that equality is increased (not decreased, as claimed by Efficiency Below) by slightly inefficient transfers from one person below the mean to a worse off person. So Efficiency Below is admittedly counter-intuitive in such cases.

The question is whether these intuitions are well founded. I claim that they can be reasonably rejected. For a plausible egalitarianism should, I claim, be tough-minded and make efficiency in helping individuals below the mean its main priority. The emphasis on efficiency is,

of course, a sort of utilitarian view, and utilitarianism is mistaken in all sorts of ways. The main relevant mistake here is that utilitarianism favors giving benefits to individuals above the mean over individuals below the mean whenever that is efficient (produces more benefits). Egalitarians must, of course, reject that view. Concerning the distribution of benefits among individuals below the mean, however, utilitarianism, I claim, gets it right.¹⁴

The issue is not whether those who are worse off have some priority. Acceptance of Absolute Priority ensures that a benefit to a person below the mean has absolute priority over any benefit (no matter how large) to a person above the mean. In addition, our acceptance of Pigou-Dalton ensures that a benefit to a worse off person has priority over a benefit of the same size to a better off person below the mean. The only question at issue is whether a benefit to a worse off person below the mean has priority over a larger status-maintaining benefit to a better off person also below the mean. My claim is that the worse off have no priority when benefiting them is inefficient.

This is, of course, a highly controversial claim, and most readers will be unconvinced by my emphasis on efficiency. The selection of a measure of equality for the purposes of an egalitarian theory of justice is a normative matter, and reasonable people will disagree about the relevant measure. My claim is not that Efficiency Below must be accepted, but rather that it can be plausibly endorsed. As I'll show below, it and Absolute Priority are compatible with the core conditions on equality, as well as with a wide variety of other plausible conditions. Thus, it is open to egalitarians, such as myself, who also have strong utilitarian inclinations to endorse Efficiency Below.

A different sort of reason for objecting to Efficiency Below is that, given Pigou-Dalton, it involves a sort of discontinuity in its evaluations of equality. For it holds that, for transfers among individuals below the mean, equality is increased by any efficient status-maintaining transfer, and

decreased by any inefficient transfer of that sort. And Pigou-Dalton holds that any even transfer of that sort increases equality. The impact on equality, thus, jumps from being positive for even and efficient transfers to being negative for inefficient transfers, without an intermediate neutral impact point.

This is indeed a discontinuity, but there is little reason to hold that discontinuities as such are implausible. What really matters is whether the resulting assessments are plausible. As an analogy, consider the lexicographic ranking of baskets of apples and oranges, which ranks any basket with more apples as preferable to one with fewer, no matter how many oranges it contains, but for baskets with the same number of apples, it ranks the basket with more oranges as preferable. This is a lexicographic ordering, and thus involves discontinuities (no number of oranges compensates for the loss of even one apple), but there is little reason to hold that this in itself is problematic. The ranking of baskets on the basis of this lexicographic principle is perfectly coherent and rationally defensible. Oranges have some value, but the value is “infinitesimal” compared with apples. Likewise in the case of equality, the mere fact that there is a discontinuity raises no problems in itself. It all depends on whether the discontinuity is plausible, and I claim that it is. The discontinuity arises because dealing with envy complaints, which requires that even transfers among individuals below the mean increase equality, is lexically posterior to dealing with fair share complaints. This is plausible, because envy complaints matter, but only “infinitesimally” compared with equal share claims. Thus, the discontinuity is appropriate.

Another objection to Efficiency Below concerns the crucial role of the mean. Why should the cutoff, below which efficiency has priority, be the mean, as opposed to the median, 50% of the median, or some independently defined poverty line? I defended the crucial role of the mean above in addressing the corresponding objection to Absolute Priority. The short answer is that we are concerned with equality, and in such a context a person’s fair share is an equal share, and that is

equal to the mean. Because dealing with fair share complaints is lexically prior to dealing with envy complaints, the mean plays an absolutely pivotal role.

An objection to the conjunction of Efficiency Below and Absolute Priority is that they are jointly incompatible with the following condition, which requires a sort of diminishing marginal impact on equality of given even transfer:

Diminishing Transfers: Equality is increased by the combination of (1) an even strictly non-reversing downward transfer of m units ($m > 0$) from a person j to a person who has n units fewer of benefits ($n > 2m$), and (2) an even strictly non-reversing upward transfer of m units from a person k , who is more than m units better off than j , to a person who has n units more benefits than k .¹⁵

The idea of this principle is that the impact on equality of a non-reversing transfer of a given amount to a person whose benefit level is lower by a given amount is greater when it is between people with lower levels of benefits (e.g., among poor people) than when it is between people with higher levels of benefits (e.g., among rich people). There is, that is, a decreasing marginal impact on equality for a fixed transfer amount and fixed transfer distance. Thus, for a fixed transfer amount and distance, if a downward transfer is combined with an upward transfer, the net result should increase equality as long as the transferor of the upward transfer is better off after the transfer than the transferee of the downward transfer was before the transfer.

This principle has a fair amount of plausibility. It is, however, incompatible with the conjunction of Efficiency Below and Absolute Priority. For it requires that $\langle 10, 10, 30, 70, 85 \rangle$ be judged as more equal than $\langle 0, 20, 40, 60, 85 \rangle$. The former can be obtained by the latter by transfer 10 units (1) from the person with 20 to the person with 0, and (2) from the person with 40 to the person

with 60. The conjunction of Efficiency Below with Absolute Priority, however, says the opposite. For Efficiency Below holds that $\langle 0, 20, 40, 60, 85 \rangle$ (with a mean of 41) is more equal than $\langle 10, 10, 35, 60, 85 \rangle$ (with a mean of 40). The former can be obtained from the latter by two efficient transfers (e.g., taking 6 from the first 10 and adding 10 to the second 10, and then taking the remaining 4 and adding 5 to the 35). And Absolute Priority, says that $\langle 10, 10, 35, 60, 85 \rangle$ is more equal than $\langle 10, 10, 30, 70, 85 \rangle$ (with a mean of 41), since the former can be obtained from the latter by a status maintaining inefficient transfer from the person with 70 (above the mean) to the person with 30 (below the mean). Hence, by transitivity, the conjunction of Efficiency Below and Absolute Priority entails that $\langle 10, 10, 30, 70, 85 \rangle$ is less equal than $\langle 0, 20, 40, 60, 85 \rangle$, which violates Diminishing Transfers.

The problem with Diminishing Transfers is that it does not take into account that some upward transfers are from people below the mean to people above the mean. Such transfers increase fair share complaints, and thus, I claim, decrease equality even when coupled with a non-reversing downward transfer of an equal amount and an equal distance. A slight weakening of Diminishing Transfers, however, is plausible:

Non-Upward-Crossing Diminishing Transfers: Equality is increased by the combination of (1) an even strictly non-reversing downward transfer of m units ($m > 0$) from a person j to a person who has n units fewer of benefits ($n > 2m$), and (2) an even strictly non-reversing upward transfer of m units from a person k , who is more than m units better off than j , to a person who has n units more benefits than k , where the transferor and the transferee of this upward transfer are on the same side of the mean (both above or both below).

This condition is exactly like the original except that it does not apply where the upward transferor is below the mean and the upward transferee is above the mean. Those sorts of transfers increase the total fair share complaints, whereas if the two are on the same side of the mean, there is no effect on total fair share complaints.

Non-Upward-Crossing Diminishing Transfers is a plausible principle, and, as I show in the next section, it is compatible with Efficiency Below and Absolute Priority. Hence, one can endorse much of the spirit of Diminishing Transfers and also endorse these two principles. Indeed, as I shall show, the two conditions are also compatible with:

Strong Non-Upward-Crossing Diminishing Transfers: Equality is increased by the combination of (1) an even non-reversing downward transfer of $m > 0$ units from a person j to a worse off person, and (2) an even non-reversing upward transfer of m units from a person k , who is more than m units better off than j , to a better off person, where the transferor and the transferee of this upward transfer are on the same side of the mean (both above or both below).

This condition is like the weaker version except that it does not require that the distance (separating the transferor and the transferee) of the downward transfer be the same as the distance of the upward transfer.

This ends my main defense of the two conditions. As further defense, I shall now show that they are compatible with the uncontroversial core conditions on equality, the above-qualified diminishing transfer conditions, and three common conditions for normalizing for different means.

5. Consistency With Other Conditions

In order to establish the consistency of Absolute Priority and Efficiency Below with the uncontroversial core conditions and other plausible conditions, I shall show that the conditions are jointly satisfied by at least one of the three equality-ranking relations that I identify below. I identify these relations both as a way of establishing consistency and as a way of seeing what an equality-ranking relation satisfying the two conditions might look like.

The three equality-ranking relations will be based on individual measures of fair share complaints and of envy complaints as follows (assuming a fixed population size throughout). (Symbolic definitions are given in the appendix.)

1. A person's fair share complaint is either the shortfall from the mean (absolute fair share complaint) or that shortfall divided by the absolute value of the mean (relative fair share complaint). Where there is no shortfall, the complaint is zero.
2. A person's envy complaint is either the total shortfall from each of those with more (absolute envy complaint) or that total shortfall divided by the absolute value of the mean (relative envy complaint). (For example, the first person's absolute envy complaint in $\langle 2,4,5 \rangle$ is 5 [=2+3].)¹⁶
3. One distribution is more equal than a second if and only if (a) it has a lower total fair share complaint, or (b) the total fair share complaints are equal and the total envy complaint is lower, or (c) the total fair complaints are equal, the total envy complaints are equal, and individual envy complaints of the first are leximax superior to those of the second (i.e., the greatest envy complaint is lower, or there is a tie and the second greatest envy complaint is lower, etc.). (These equality-ranking relations thus hold that dealing with fair share complaints is lexically prior to dealing with envy complaints, and that, in dealing with envy complaints, minimizing the total complaint is lexically prior to leximaxing individual complaints.)

Given that we have two measures (absolute and relative) of individual fair share complaint and two of envy complaint, that gives us four possible relations of being-more-equal-than. In fact, I shall need to appeal to only three of them:

P1: based on absolute fair share complaint and absolute envy complaint

P2: based on relative fair share complaint and relative envy complaint

P3: based on absolute fair share complaint and relative envy complaint.

P2 and P3 both involve division by the mean. This is well defined only if there is a natural zero and the mean is not zero. Furthermore, as noted in the previous section, such relative measures are quite implausible when benefits are both positive and negative. For that reason the behavior of P2 and P3 will be considered below only for the case where benefits can only be positive. (For simplicity the case where benefits can only be negative is ignored.)

Let us start by noting that all three of these relations satisfy Absolute Priority, Efficiency Below as well as the uncontroversial conditions¹⁷ and the weakened diminishing transfers condition. Proofs of this and the following observation are given in Vallentyne (1999).

Observation 1: P1 satisfies Perfect Equality, Pigou-Dalton, Conditional Contracting Extremes, Strong Non-Upward-Crossing Diminishing Transfers (as well as Non-Upward-Crossing Diminishing Transfers), Efficiency Below, and Absolute Priority. Furthermore, if there is an absolute zero and benefits can only be positive, then P2 and P3 also satisfy these conditions.

Next, consider three common conditions dealing with the issue of whether equality is to be understood in absolute or relative terms:

Constant Additions Invariance: Equality is unaffected by increasing each person's benefits by the same amount.

Conditional Proportionate Increases Invariance: If there is an absolute zero for benefits and all benefits are positive, or all benefits are negative, then equality is unaffected by multiplying each person's benefits by the same positive factor.

Compromise Condition: Equality is increased by increasing each person's benefits by the same positive amount, and equality is decreased by multiplying each person's benefits by the same factor greater than one.

Constant Additions Invariance is the standard condition for an absolute conception of equality. It holds that equality is based on the absolute magnitude of the differences in people's benefits. Conditional Proportionate Increases Invariance is a condition for a qualified relative view of benefits. It holds that where there is an absolute zero and all benefits are positive, or all are negative, then equality is based on the proportionate shares rather than the absolute benefit levels. This condition is usually stated in its unconditional form, but, as noted in the previous section, it is implausible when there is no absolute zero, or benefits are both positive and negative. The conditional form of the condition, however, is not obviously implausible. Finally, Compromise Condition denies the two invariance claims of the two previous conditions, and holds instead that (1) equality is increased by increasing everyone's benefits by the same amount and (2) equality is decreased by multiplying everyone's benefits by the same factor greater than one.¹⁸

Let us note for the record:

Observation 2: P1 satisfies Constants Additions Invariance, and if there is a natural zero and benefits can only be positive, then P2 satisfies Conditional Proportionate Increases Invariance and P3 satisfies Compromise Condition.

Thus, Absolute Priority and Efficiency Below are compatible with the three main plausible ways of taking differences in means into account. As noted in the previous section, however, Absolute Priority is incompatible with the more common unconditional form of Proportionate Increases Invariance, but this condition is clearly implausible when there is no natural zero, when the mean is zero, or when benefits are both positive and negative. The condition is not obviously implausible, however, if it is conditional on there being a natural zero and all benefits being non-negative (or all benefits being non-positive). Absolute Priority is, however, incompatible with this weakened condition, since Absolute Priority says that $\langle 0,1 \rangle$ is more equal than $\langle 0,10 \rangle$, whereas the weakened proportionate increases invariance condition says that they are equally equal. So, where there is a natural zero and some people have zero benefits, Absolute Priority is incompatible with the usual relative conception of equality. Under these conditions, however, this relative conception of equality is, I have claimed, mistaken. Increasing the benefits of the best off person with no increase in the benefits of the worse off person decreases equality in the sense relevant for egalitarian justice.

6. Conclusion

I have defended Absolute Priority, which holds that equality is increased by all status-maintaining transfers from individuals above the mean to individuals below the mean. Far more controversial is Efficiency Below, which holds that equality is increased by any efficient status-maintaining transfer between individuals below the mean. Although this condition is compatible with giving priority to

worse off individuals when a fixed benefit is involved (as required by Pigou-Dalton), it allows no such priority when an inefficiency is involved below the mean.

The conjunction of Absolute Priority and Efficiency Below combines weakened versions of leximin and a utilitarian principle. Like leximin, it holds that benefits to individuals below the mean take absolute priority over benefits to above the mean people. Like utilitarianism it holds that, among individuals below the mean, benefits should be distributed on the basis of who will benefit the most. This combination, I claim, represents a plausible approach for the measurement of equality for egalitarian justice.¹⁹

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APPENDIX

The following notation may help clarify the key notions of the paper.

x : a distribution of benefits, $\langle x_1, x_2, \dots, x_n \rangle$, where $x_1 \leq x_2 \dots x_{n-1} \leq x_n$ (i.e., where benefits are numbered in order of increasing size)

n : total number of people $n_b(x)$: number of people below the mean in x

$m(x)$: mean of $x = (\sum_{i=1}^n x_i)/n$ $m_b(x)$: mean in x of those below the mean

$f_i(x)$: person i 's absolute fair share complaint in $x =$ his/her shortfall from the mean in x , i.e.,
 $\max(0, m(x) - x_i)$

$f(x)$: total absolute fair share complaint in $x =$ total shortfall from mean in x , i.e., $\sum_{i=1}^n f_i(x)$,
 which equals $n_b(x)[m(x) - m_b(x)]$

$e_i(x)$: person i 's absolute envy complaint in $x =$ his/her total shortfall from those with more in x ,
 i.e., $\sum_{j=i+1}^n (x_j - x_i)$

$e(x)$: total absolute envy complaint in $x =$ total (over people) of each person's total shortfall from those with more in x , i.e., $\sum_{i=1}^n e_i(x)$, which equals $n^2 m(x) + nm(x) - [nx_1 + (n-1)x_2 + \dots + 2x_{n-1} + x_n]$

$P1_{xy}$ iff (1) $f(x) < f(y)$, or (2) $f(x) = f(y)$ and $e(x) < e(y)$, or (3) $f(x) = f(y)$, $e(x) = e(y)$, and x is leximax superior to y with respect to e_i (i.e., the maximum value of e_i is lower for x , or in case of ties the second largest value is lower, and so on).

$P2_{xy}$ iff (1) $f(x)/m(x) < f(y)/m(y)$, or (2) $f(x)/m(x) = f(y)/m(y)$ and $e(x)/m(x) < e(y)/m(y)$, or (3) $f(x)/m(x) = f(y)/m(y)$, $e(x)/m(x) = e(y)/m(y)$, and x is leximax superior to y with respect to e_i/m .

$P3_{xy}$ iff (1) $f(x) < f(y)$, or (2) $f(x) = f(y)$ and $e(x)/m(x) < e(y)/m(y)$, or (3) $f(x) = f(y)$, $e(x)/m(x) = e(y)/m(y)$, and x is leximax superior to y with respect to e_i/m .

Notes added after publication:

1. To defend Absolute Priority, assuming priority of fair-share complaints are lexically prior to envy complaints, there are four cases: (a) Even transfers: This follows from PD. Furthermore, beneficiary has fair share complaint reduced and no one else is affected. (b) Normal inefficient transfers (i.e., some benefit transferred down): This is easy. The beneficiary has fair share complaint reduced and so do others below mean (because mean is reduced). (c) Normal efficient transfers. This is somewhat controversial, but still plausible, since these are Pareto incomparable distributions and the person below average is benefited. Where there is uniform weight for fair share complaints this case is satisfied. If, however, larger complaints have larger weight, then the condition could be violated. If the beneficiary is the best off person below the mean, then the efficient transfer might increase in the mean enough so that the weighted complaints of those who are worse off increase in aggregate by more than the decrease in the beneficiary's complaint. Thus, the crucial claim is that any benefit *no matter how large* to a person below the mean takes priority over any benefit *no matter how small* to a person above the mean. (d) Hyper efficient transfers: This case is Monotonicity Below the Mean: Increasing the benefits of a person who even after the increase still has less than the mean benefit (with no other changes) increases equality. This is the most controversial part of Absolute Priority, since it is a Pareto improvement and thus it need not be equality that favors the improvement. It can be violated under the same conditions as (c) above.

Notes

¹ See, for example, Arneson (1989) and Cohen (1989).

² For enlightening discussions of why egalitarians should allow equality-decreasing promotion of benefits see: Barry (1989, ch. 6), McKerlie (1994, 1996), Nagel (1979, 1991), and Parfit (1991).

For discussions of the more specific view that egalitarians should be concerned only with equality among the Pareto optimal alternatives, see Martin (1985), Weale (1980), and Williams (1995).

³ For enlightening discussion of some of the main measures of equality, and of some conditions that a plausible measure of equality must satisfy, see: Cowell (1977), Nygård and Sandström (1981), Rae et al. (1981), Foster (1985), Chakravarty (1990), Coulter (1989), Sen (1997), and Blackorby, Bossert, and Donaldson (forthcoming).

⁴ In the context of anonymity, Pigou-Dalton is equivalent to: If the total amount of benefits remains constant, then equality is increased by any transfer of benefits that lexicographically increases the lowest benefit level (i.e., that increases the lowest benefit level, and in cases of ties increases the next lowest benefit level, and so on). Pigou-Dalton on its own is silent about whether equality is increased by transferring 3 downward to move from $\langle 1,5 \rangle$ to $\langle 4,2 \rangle$ (since this would be a reversing transfer—making the transferor worse off than the transferee). Pigou-Dalton does say, however, that equality is increased by transferring 1 downward, and this yields $\langle 2,4 \rangle$.

Anonymity then adds that $\langle 4,2 \rangle$ is just as equal as $\langle 2,4 \rangle$.

⁵ The antecedent condition—that there is no natural zero for benefits (no non-arbitrary way of drawing the line between positive and negative levels) or that all benefit levels are positive or all are negative—is imposed so as not to require, for example, that $\langle 0,10 \rangle$ is less equal than $\langle 0,1 \rangle$.

Although this result and the unconditional version of the contracting extremes condition, would,

I think, be plausible (indeed, I shall endorse them later), they would not be uncontroversial (not endorsed by all theories). For certain relative measures of equality (which, as discussed below, hold that the degree of equality is determined by proportional, not absolute, benefits) hold that the two distributions are equally equal (on the grounds that each person has the same proportion of the total benefits under the first as under the second). Because we are now focussing on the concept of equality, I do not here build in the controversial result. [Notes added after publication: (1) PD alone entails contracting of both extremes by equal amount makes things more equal. (2) Alternative conditions that avoid need to specify no natural zero, etc.: Another possible condition (a) [Bertil's version]: Equality is increased by *double* adjustment (not each on its own) of (1) any decrease in the benefits of a best off person that leaves him/her still a best off person, combined with (2) any increase in the benefits of a worst off person that leaves him still a worst off person. This does not completely solve the problem, since relative versions hold $\langle -2, 2 \rangle$ is equally equal with $\langle -1, 1 \rangle$, but this is so wildly implausible, it's okay to rule it out. (3) Where there are at least *three* people, contracting *both* ends makes things more equal. Incompatible with relative conception: $\langle -7, 2, 6 \rangle > (\text{PD}) \langle -5, 2, 4 \rangle > (\text{PD}) \langle -4, 1, 4 \rangle = (\text{proportionate}) \langle -8, 2, 8 \rangle$.

⁶ Note that, given anonymity, Pigou Dalton entails that for any given total benefit the most equal distribution is one where everyone has the same amount. It does not, however, entail Perfect Equality, since it does not entail that $\langle 2, 2 \rangle$ is just as equal as $\langle 3, 3 \rangle$ (which has a different total). Note also that, given anonymity, Pigou-Dalton also entails, that for a given total benefit, the most unequal distribution is one in which just one person has it all.

⁷ Note that the notion of efficiency used here is interpersonal (makes interpersonal comparisons), rather than the non-interpersonal notion used in the notion of efficiency in the Pareto optimality sense. The interpersonal sense entails the Pareto optimal sense, but not vice-versa.

⁸ Note that, although I will (as is common in the literature) focus on transfers, the implications are much broader. For if one distribution is obtainable from another by a certain kind of transfer, certain transfer principles will require that the two be ranked in a certain way, even if there is no real transfer involved (e.g., Pigou-Dalton ranks $\langle 1,2 \rangle$ as more equal than $\langle 0,3 \rangle$, even if no real transfer is involved).

⁹ Temkin (1993) argues convincingly that our concept of equality is complex and thus indeterminate in many cases (going beyond the conditions of the previous section). In this paper I defend a particular conception of equality for egalitarian theories of justice. This is, I believe, compatible with Temkin's claim, since I do not claim that this conception is required by the concept of equality.

¹⁰ The appeal to the mean as a reference point is similar in many ways to the appeal to a specified poverty line used in the measurement of poverty. See, for example, Sen (1976a), Foster (1984), Donaldson and Weymark (1986), and Chakravarty (1990).

¹¹ Absolute Priority contains some redundancy in the context of Pigou-Dalton and Efficiency Below. There are three kinds of status-maintaining transfer from a person above the mean to a person below the mean to consider: even, efficient, and inefficient transfers. Pigou-Dalton directly entails that equality is promoted by any even such transfer. And in conjunction with Pigou-Dalton, Efficiency Below ensures that equality is increased by any efficient such transfer. This is so, since any such transfer can be achieved by first making an even transfer to the person below the mean (which increases equality by Pigou-Dalton), and then increasing the benefit of the person below the mean (which, as a case of hyperefficiency, increases equality by Efficiency Below). Hence, the only non-redundant part of Absolute Priority is the claim that equality is

increased by all inefficient status-maintaining transfers from a person above the mean to a person below the mean.

¹² See Rawls (1971, p. 98). I'm indebted to Tungodden (forthcoming) for bringing this point to my attention. In that paper he explores, as I do here, some ways of giving absolute priority the worst off group without giving absolute priority to the worst off person. The projects are different, however, in that he is concerned with overall moral goodness, whereas I am concerned only with the measurement of equality. More specifically, he endorses a requirement that a Pareto improvement make things better. Although this may be a plausible condition on overall moral goodness, it is implausible as a condition on equality (since an increase in the best off person decreases equality).

¹³ The idea of thinking of equality as concerned with reducing complaints comes from Broome (1989) and Temkin (1993). They do not, however, distinguish fair share from envy complaints.

¹⁴ For enlightening discussion of the tension between efficiency and the priority of the worst off, see Sen (1974) and Griffin (1981). For important early statements of the absolute priority of the worse off (regardless of efficiency considerations), see Strasnick (1976), Sen (1976b), and Hammond (1976).

¹⁵ This principle is briefly informally discussed by Atkinson (1970) and explicitly introduced by Kolm (1976b). Shorrocks and Foster (1987) insightfully analyze a slight strengthening of this principle.

¹⁶ Broome (1989, p. 255) identifies the absolute shortfall from those above as a possible measure of fairness complaints, but does not distinguish fair share complaints from envy complaints. My suggestion is that this measure, or its relativized version, is appropriate for envy complaints, but not for fair share complaints.

¹⁷ It is also easy to show that P1-P3 are anonymous, transitive, and asymmetric.

¹⁸ Assuming Pigou Dalton, Proportionate Increases Invariance entails that adding the same positive amount to each person increases equality, and Constant Additions Invariance entails that multiplying all benefits by the same factor greater than one decreases equality. Hence Compromise Condition captures part of each of the other two conditions. See Kolm (1976a&b), Bossert and Pfingsten (1990), and Temkin (1993, ch. 6) for discussion of other kinds of measures that satisfy these two conditions.

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