

## THE EQUIVALENCE OF EGALITARIANISM AND PRIORITARIANISM

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EVER SINCE PARFIT distinguished prioritarianism from egalitarianism, there has been a debate concerning the significance of the distinction.<sup>1</sup> While everyone agrees that egalitarianism and prioritarianism are different theories of social welfare, it is controversial what the distinction implies. Will the theories evaluate and rank populations differently? Or do their differences disappear when they are used for evaluations?

Both Temkin and Broome argue that egalitarianism and prioritarianism will evaluate populations differently, whereas Fleurbaey disagrees and is supported (in part) by Tungodden, McCarthy, and Jensen.<sup>2</sup> In this essay I will side with Fleurbaey and argue that, although egalitarianism and prioritarianism are different theories of social welfare, they can always evaluate populations in the same way. They can, in other words, use the same *social welfare measures*.

This proposal runs counter to a common practice of representing egalitarianism and prioritarianism by different social welfare measures. Egalitarianism is often represented by a derived measure that includes a measure of equality, whereas prioritarianism is usually represented by an additively separable concave function on individual welfare values. These choices of measures are meant to reflect the egalitarian view that equality affects social welfare directly, and the prioritarian view that welfare changes for worse-faring people affect social welfare more. I will argue that this practice is unwarranted. More specifically, I will present six different arguments for the thesis that there is no (or little) reason to distinguish between egalitarian and prioritarian measures.

- 1 Parfit had distinguished between the two views at least by 1989, as noted by Temkin, “Equality, Priority, or What?” 8.
- 2 See Temkin, “Equality, Priority, or What?” sec. 9.1, and *Inequality*, sec. 1.E; Broome, “Equality versus Priority,” secs. 1–3; Fleurbaey, “Equality versus Priority,” secs. 1–4; Tungodden, “The Value of Equality,” sec. 5; Jensen, “What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?” sec. 6; and McCarthy, “Risk-Free Approaches to the Priority View,” 441.

The first argument is based on conceptual connections between inequality and worse faring. I argue that a measure that is sensitive to inequality is necessarily more sensitive to welfare changes for the worse-faring people, and vice versa. Thus, any measure that works for egalitarianism will work for prioritarianism, and any measure that works for prioritarianism will work for egalitarianism as well.

The second argument is based on the equivalence of two minimal conditions that egalitarian or prioritarian measures must satisfy. I argue that satisfying a certain egalitarian condition is both necessary and sufficient for a social welfare measure to qualify as egalitarian. The condition states that if everything is equal between two populations, except for the welfare of one pair of persons, the population with the more equal-faring pair does better. I also argue that satisfying a certain prioritarian condition is both necessary and sufficient for a social welfare measure to qualify as prioritarian. This condition states that, given the choice between increasing the welfare of either of two persons by the same amount, it is better to increase the welfare of the worse-faring person. However, the two conditions are equivalent. Since the two conditions are equivalent, and both are necessary and sufficient to identify their respective measures, there cannot be an egalitarian measure that is not also a prioritarian measure, and vice versa.

The third argument is based on the potential double uses for a standard egalitarian and a standard prioritarian measure. The standard egalitarian measure is a derived measure that multiplies a measure of equality with a measure of total individual welfare, whereas the standard prioritarian measure is an additively separable concave function on individual welfare values. I argue that both measures can be used for either theory.

The fourth to sixth arguments are based on the ability of both egalitarian and prioritarian measures to incorporate properties that have been proposed as fitting for only one of the two theories. The properties in question are: pareto satisfiability, level sensitivity, and relationality (implying non-separability). The standard egalitarian measure is non-pareto satisfying, level insensitive, relational, and non-separable, while the standard prioritarian measure is pareto satisfying, level sensitive, non-relational, and separable. I argue that there is no reason to insist that egalitarianism should use a non-pareto-satisfying, level-insensitive measure, while prioritarianism should use a pareto-satisfying, level-sensitive measure. There is also no reason for prioritarianism to avoid a relational and non-separable measure, although there may be a reason for egalitarianism to avoid a non-relational and separable measure. This is however only the case if a measure must reflect intrinsic dependence relations between social welfare and equality in its very form, which is doubtful.

The essay is structured as follows: in section 1, I distinguish between egalitar-

ianism and prioritarianism as (partial) theories of social welfare; in section 2, I present some assumptions regarding the measurability of individual and social welfare; in section 3, I present the argument from conceptual connections; in section 4, I present the argument from minimal conditions; in section 5, I present the argument from standard measures; in section 6, I present arguments from non-distinguishing properties, and in section 7, I make some concluding remarks.

### 1. EGALITARIANISM AND PRIORITARIANISM

A social welfare theory can be either axiological or normative: as an axiological theory it concerns the value of populations; as a normative theory it concerns what we should do with respect to populations. While an axiological theory mainly has to consider the intrinsic properties of populations that make them good, a normative theory also has to consider the extrinsic properties of populations that are relevant for decisions, such as the probability that a possible population is realized given a certain set of acts. Here, I will consider egalitarianism and prioritarianism only as axiological theories and discuss the value of populations only relative to their intrinsic properties. However, one could easily transform the axiological theories into normative theories—for example by adding that we should maximize expected social welfare.

Regarded as axiological theories, egalitarianism and prioritarianism have two functions: one explanatory and one evaluative. The first function is to explain what intrinsically affects the social welfare of a population (and how); the second function is to assess populations in terms of their degrees of social welfare. The second function is fulfilled by a *social welfare measure*.

All social welfare theories claim that social welfare is a function of individual welfare. The goodness or badness of populations depends, in some way, on how their individual members fare. Thus all theories include the following claim:

*Dependence:* The individual welfare levels of the members of a population intrinsically affect the degree of social welfare of the population.

The idea that social welfare would depend *only* on aggregated individual welfare seems intuitively wrong, however. Individuals are separate and the low welfare of some individuals cannot be wholly compensated by the high welfare of others. Thus, distribution of welfare matters too. But how? Egalitarianism and prioritarianism give two different answers to this question.<sup>3</sup> The core of these answers can be presented as follows:

3 For egalitarian ideas see Sidgwick, *The Methods of Ethics*, 417; Smart and Williams, *Utilitarianism*, 34; and Temkin, “Equality, Priority, or What?” 60. For prioritarian ideas, see Sen, *On*

*Egalitarianism*: The degree of inequality in individual welfare among the members of a population intrinsically and invariably negatively affects the social welfare of the population in such a way that had the degree of inequality been less, social welfare would have been higher (everything else being equal).<sup>4</sup>

*Prioritarianism*: Individual welfare changes for a population's worse-faring members intrinsically and invariably affect the social welfare of the population more than equally sized changes for its better-faring members, with increases having a larger positive effect and decreases a larger negative effect on social welfare.<sup>5</sup>

As formulated above, egalitarianism is presented as a theory about the contribution to social welfare by a property of populations (inequality), whereas prioritarianism is presented as a theory about the contribution to social welfare by changes in individual welfare. This difference in subject is standard.

Both the egalitarian and the prioritarian presentations contain terms whose interpretation is contested: "inequality" and "worse faring." "Inequality" admits of more interpretations than can be listed here, while "worse faring" admits of at least two: a personal and an impersonal one, yielding two distinct versions of prioritarianism.<sup>6</sup>

*Personal Worse Faring*: A member  $p$  of a population  $A$  is *personally worse faring* if and only if  $p$  fares worse than at least one other member of  $A$ . Furthermore, a member  $p_i$ , with welfare level  $w_i$ , fares personally worse than a member  $p_j$ , with welfare level  $w_j$ , to the degree that  $w_i$  is lower than  $w_j$ .

*Impersonal Worse Faring*: A member  $p$  of a population  $A$  is *impersonally worse faring* if and only if  $p$  fares worse than  $p$  would with a higher level of welfare. Furthermore, a member  $p$ , with welfare level  $w_i$ , fares impersonally worse than  $p$  would fare at a higher welfare level  $w_j$  to the degree that  $w_i$  is lower than  $w_j$ .

The personal version of prioritarianism identifies the worse-faring members of a population relative to members of the same population, whereas the impersonal

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*Economic Inequality*, 18; Scheffler, *The Rejection of Consequentialism*, 31; Nagel, *Equality and Partiality*, 70; and Parfit, "Equality and Priority," 213.

4 Similar presentations may be found in McKerlie, "Equality and Priority," 25; and Holtug, *Persons, Interests, and Justice*, 171.

5 A similar presentation may be found in Parfit, "Equality and Priority," 213.

6 Compare Hirose, *Egalitarianism*, 93.

version of prioritarianism identifies the worse-faring members of a population relative to higher levels of welfare. According to the personal version of prioritarianism, the worse-faring members are those whose welfare levels are below at least one other member's welfare level. According to the impersonal version of prioritarianism, the worse-faring members are those whose welfare levels are below some other level of welfare. Everyone who is personally worse faring is impersonally worse faring as well, although the opposite is not always the case. A population of equally faring members does not have worse-faring members in the first sense, but could have them in the second sense.

The distinction between "personal" and "impersonal" prioritarianism is related to two distinctions made by other authors. Persson makes a distinction between "relative" and "absolute" prioritarianism, which captures whether relations between welfare levels or absolute welfare values matter for social welfare. Temkin makes a similar distinction between "comparative" and "non-comparative" prioritarianism.<sup>7</sup> Both these distinctions are potentially misleading, since absolute welfare values matter for any prioritarian, and any type of prioritarianism can be expressed in a relational or comparative form. I will thus only use the distinctions between "personal" and "impersonal" prioritarianism here.

Personal prioritarianism could be exemplified by rank-weighted total utilitarianism, while impersonal prioritarianism could be exemplified by a theory using an additively separable concave function on individual welfare values.<sup>8</sup> The impersonal version of prioritarianism is favored by Parfit and the personal version is favored by Buchak.<sup>9</sup>

Neither of the core ideas of egalitarianism and prioritarianism presents a complete theory of social welfare. It is not sufficient to point out *what* intrinsically affects the social welfare of a population: one must also explain *how*. Egalitarianism must explain how individual welfare and inequality intrinsically affect the social welfare of populations. Prioritarianism must explain how individual welfare changes vary in their effect on social welfare depending on the members' initial degrees of worse faring. For example: Does the egalitarian think that

7 See Persson, "Equality, Priority and Person-Affecting Value," 35; and Temkin, *Inequality*, 165.

8 For a presentation of the first type, see for example Ebert, "Rawls and Bentham Reconciled," 215; and Buchak, "Taking Risks behind the Veil of Ignorance," 643–44. For a presentation of the second type, see for example Rabinowicz, "Prioritarianism for Prospects," 8–9; Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 99; Peterson and Hanson, "Equality and Priority," 301; Brown, "Prioritarianism for Variable Populations," 330; Holtug, *Persons, Interests, and Justice*, 205; Adler, *Well-Being and Fair Distribution*, 307; Broome, "Equality versus Priority," 221; and Hirose, *Egalitarianism*, 89.

9 See Parfit, "Equality or Priority?" 104; and Buchak, "Taking Risks behind the Veil of Ignorance," 610.

individual welfare and inequality affect social welfare directly and separately, or is it rather that both affect social welfare indirectly and jointly, by inequality (adversely) determining the degree to which individual welfare affects social welfare? And does the prioritarian think that individual welfare changes for worse-faring members matter more because lower welfare levels have a larger weight when individual welfare (indirectly) contributes to social welfare, or is it rather that the individual welfare levels of worse-faring members matter lexically to social welfare, as they do assuming *leximin*?<sup>10</sup>

A completely specified theory of what factors intrinsically affect social welfare, and how, includes a measure of social welfare, as the how question is most precisely answered in mathematical form. A measure of social welfare is, however, not sufficient in itself as a theory of social welfare, because its pure mathematical form does not clearly express anything regarding intrinsic dependence relations between social welfare and other factors (such relations can at best be inferred).<sup>11</sup>

Egalitarianism can be understood as a class of completely specified theories that capture the core egalitarian idea, whereas prioritarianism can be understood as a class of completely specified theories that capture the core prioritarian idea. These classes overlap, although they might not overlap completely. Even if they do not overlap, however, the classes of egalitarian and prioritarian *measures* might.<sup>12</sup>

The remainder of this essay will focus on the evaluative function of egalitarianism and prioritarianism, as it is fulfilled by egalitarian and prioritarian social welfare measures. First, however, I need to make some assumptions regarding the measurability of social welfare.

## 2. ASSUMPTIONS

In general, a measure of social welfare  $W$  is a function that assigns real numbers to all possible populations, directly representing their levels of social welfare, and indirectly representing relations between their levels of social welfare. I will not make any assumptions about whether the measure would be ratio, interval, or just ordinal scale. However, the relation *is better than* (in terms of social welfare) would be represented as irreflexive, asymmetric, and transitive, whereas

10 *Leximin* was proposed by Sen, *Collective Choice and Social Welfare*, 138. Compare Rawls, *A Theory of Justice*, 78.

11 Compare Fleurbaey, "Equality versus Priority," 205.

12 Related remarks regarding social welfare rankings have been made by Adler, *Well-Being and Fair Distribution*, 364; and Fleurbaey, "Equality versus Priority," 213.

the relation *is equally good as* (in terms of social welfare) would be represented as reflexive, symmetric, and transitive.

Since social welfare, at least in part, positively depends on individual welfare, a measure of social welfare must, at least in part, positively depend on a measure of individual welfare. This is the case whether the social welfare measure is egalitarian or prioritarian. I will thus assume that there is a measure of individual welfare  $w$ , assigning numbers to all individuals, directly representing their levels of welfare, and indirectly representing relations between their levels of welfare. The relation of *worse faring* is represented by the absolute difference between a lower and a higher degree of welfare and is irreflexive, asymmetric, and transitive (whereas the relation of *equal faring* is reflexive, symmetric, and transitive). The measure  $w$  is continuous, as well as ratio scale. For simplicity I will assume that it assigns only positive numbers.

In order to qualify as an egalitarian or prioritarian measure, a social welfare measure should assign numbers in a way that reflects the idea that inequality has a negative effect on social welfare or the idea that welfare changes for worse-faring individuals affect social welfare more (in the sense that welfare increases have a larger positive effect and welfare decreases have a larger negative effect). Such measures could take several different forms. I will consider two possibilities here.

One possibility is to use a measure that aggregates individual welfare by an additively separable, strictly concave function that gives lower welfare values larger weight. This type of measure shows social welfare to be a joint function of individual welfare and the diminishing marginal importance of individual welfare. It is the standard measure for prioritarianism since it captures the idea that welfare changes for (impersonally) worse-faring people affect social welfare more. However, it has also been used for egalitarianism since it also captures the idea that inequality has a negative effect on social welfare, at least in the comparative sense that an unequal distribution of a fixed amount of total welfare yields a lower degree of social welfare than an equal distribution does.

Another possibility is to use a derived measure that combines a measure of aggregated individual welfare with another measure that either captures the effect of inequality or the effect of worse faring. If the two measures are multiplied, such a measure would show social welfare to be a function of two interacting factors. In the egalitarian case, inequality would affect the degree to which aggregated individual welfare contributes to social welfare; in the prioritarian case, aggregated worse faring would.

I should add that I will only discuss measures that are wholly egalitarian or prioritarian. By this I mean measures that completely express either of the core ideas, most importantly the idea that inequality *invariably* has a negative effect

on social welfare or that welfare changes for worse-faring members *invariably* matter more. This does not exclude measures that express the idea that inequality or changes for the worse-faring members matter *pro tanto*. However, it does exclude measures that are only responsive to inequality between the best- and worst-faring members, and measures that only prioritize the worse-faring members at the lowest levels of welfare (like *maximin*).

### 3. THE ARGUMENT FROM CONCEPTUAL CONNECTIONS

The first argument for the thesis that egalitarians and prioritarians can use the same measures focuses on how the measures would be responsive to the properties that social welfare intrinsically depends on (according to these theories). Due to conceptual connections between inequality and worse faring, measures that are responsive to one property are necessarily responsive to the other (in the relevant way). Consequently, egalitarian and prioritarian measures cannot be distinguished (at least not extensionally).

The first obvious conceptual connection is between inequality and personal worse faring. An unequal population consists of members who, when paired with other members, for at least one pairing come out as one better-faring and one worse-faring member. The more unequally the pair is faring, the better faring is one member and the worse faring is the other. The second equally obvious conceptual connection is between personal and impersonal worse faring. A population with personally worse-faring members has impersonally worse-faring members as well, although the opposite is not always the case. The more personally worse faring a member  $p_i$  is, relative to another member  $p_j$ , the more impersonally worse faring the member  $p_i$  is as well, relative to the welfare level of  $p_j$ .

By virtue of purely conceptual connections, it is the case that if degrees of inequality intrinsically affect social welfare, then same-sized welfare changes for the worse-faring members of a population will instrumentally affect social welfare more, since such changes affect inequality more.<sup>13</sup> This is the case whether the worse-faring members are personally worse faring or impersonally worse faring. Also by virtue of purely conceptual connections, if same-sized welfare changes for the worse-faring members of a population intrinsically affect social welfare more, then same-sized changes that affect the degree of inequality more will instrumentally affect social welfare more, since such changes affect the wel-

13 Similar remarks have been made by Temkin, "Equality, Priority, or What?" 60; Parfit, "Equality or Priority?" 103; Sen and Foster, *On Economic Inequality*, 145; and Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 101.

fare levels of the worse-faring members more.<sup>14</sup> This is also the case whether the worse-faring members are personally worse faring or impersonally worse faring.

According to egalitarians, individual welfare and inequality intrinsically affect social welfare, and according to prioritarrians, individual welfare and worse faring do.<sup>15</sup> An egalitarian measure will thus reflect that *inequality* ( $i$ ) and *individual welfare* ( $w$ ) affect  $W_e$  (egalitarian social welfare), whereas a prioritarian measure will reflect that *worse faring* ( $f$ ) and *individual welfare* ( $w$ ) affect  $W_p$  (prioritarian social welfare). Now, if  $f$  instrumentally and proportionally affects  $i$ , and  $i$  and  $w$  intrinsically affect  $W_e$ , then a measure of  $f$  and  $w$  can be used as a measure of  $W_e$ . Likewise, if  $i$  instrumentally and proportionally affects  $f$ , and  $f$  and  $w$  affect  $W_p$ , then a measure of  $i$  and  $f$  can be used as a measure of  $W_p$ . And since  $f$  and  $i$  instrumentally and proportionally affect each other, any egalitarian measure works as a prioritarian measure, and vice versa.

One possible objection to this argument is that it does not consider the different types of measures standardly used to represent egalitarianism and prioritarianism. Prioritarianism is usually represented by an additively separable, strictly concave function on individual welfare values, whereas egalitarianism is usually represented by a derived measure containing a measure of individual welfare and a measure of equality. Thus prioritarianism usually does not represent worse faring as a separate factor in the way that egalitarianism usually represents equality as a separate factor. This difference is not brought up in the argument above and might affect the interchangeability of egalitarian and prioritarian measures.

However, the argument above does not presuppose any particular kind of measure. It does not presuppose that either the egalitarian or the prioritarian measure is a derived measure that, for example, conjoins two separate measures, one of individual welfare, and one of either inequality or worse faring. What the argument presupposes is only that the egalitarian or prioritarian measure is appropriately affected by the relevant properties. If a certain method of aggregating individual welfare makes a measure sensitive to inequality or worse faring in an adequate way, it would qualify as a measure of  $i$  and  $w$  or  $f$  and  $w$ , no matter what type of measure is used.

Another possible objection to the above argument is that it misrepresents at least the impersonal version of prioritarianism and thus the relation between egalitarian and prioritarian measures. It is not really that the relation of worse faring affects social welfare, a prioritarian might say, but rather that changes of

14 Similar remarks have been made by Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 101; and Fleurbaey, "Equality versus Priority," 207.

15 The egalitarian remark has previously been made by McCarthy, "Distributive Equality," 1047.

people's lower welfare levels affect social welfare more than changes of people's higher welfare levels. This matter can be expressed without the use of any relations, and is thus independent of any relations.

I concede that impersonal prioritarianism can be expressed without reference to the relation of worse faring. However, as long as impersonal prioritarianism *could* be expressed with reference to the relation of worse faring and this relation has the relationship to inequality as described above, the above reasoning still applies.

Yet another possible objection to the above argument is that it misrepresents the relationship between inequality and worse faring and thus the relation between egalitarian and prioritarian measures. More precisely, the objection is this: an unequal population necessarily contains members who are worse faring and better faring. But an egalitarian cannot say that welfare changes for the worse-faring members affect social welfare more, since, with respect to inequality, the worse-faring and the better-faring members cannot be separated as obstacles to social welfare. Supposedly, adding 1 in welfare to the best-faring member increases inequality by as much as adding 1 in welfare to the worse-faring member decreases inequality; and subtracting 1 in welfare from the best-faring member decreases inequality by as much as subtracting 1 in welfare from the worse-faring member increases inequality. So, on this view, an egalitarian should think that welfare changes for the best-faring and the worst-faring members affect social welfare the most, whereas welfare changes for middle-faring members affect social welfare the least. In contrast, the prioritarian should think that welfare changes for the worst-faring members affect social welfare the most, whereas welfare changes for the best-faring members affect social welfare the least. Thus, if a population  $A$  has the welfare vector  $\mathbf{v}_A = (3, 2, 1)$ , an egalitarian should claim that welfare changes for the person with 3 or 1 in welfare affect social welfare the most, whereas a prioritarian should claim that welfare changes for the person with 1 in welfare affect social welfare the most, while welfare changes for the person with 3 in welfare affect social welfare the least (assuming that the changes are equal). This difference should be reflected by egalitarian and prioritarian measures, and so, according to the present objection, the measures are not interchangeable.

However, this objection does not hold up to scrutiny. Even if an egalitarian would claim that welfare changes for the worse-faring and the best-faring members affect *inequality* equally (which many egalitarians would not, by the way), an egalitarian cannot claim that welfare changes for the worse-faring and the best-faring members affect *social welfare* equally. This could be shown in different ways. One way to show it is just to note that an egalitarian cares about in-

dividual welfare in addition to equality. So, when 1 is added to the best-faring member, this is good in a way, and bad in another, whereas when 1 is added to the worst-faring member, this is only good. (Likewise: when 1 is subtracted from the best-faring member, this is bad in a way and good in another, whereas when 1 is subtracted from the worst-faring member, this is only bad.) Thus changes to the worst-faring and the best-faring members cannot affect social welfare equally.

This point can be illustrated with an example. Let us suppose that degrees of inequality are identified with total welfare differences (similar to a proposal by Rabinowicz).<sup>16</sup> It is then correct that subtracting 1 from the best-faring member decreases inequality by as much as subtracting 1 from the worst-faring member increases inequality. In the example with the population with welfare vector  $(3, 2, 1)$ , the absolute changes in total welfare differences are the same whether 1 is added to the best-faring member or subtracted from the worst-faring member, subtracted from the best-faring member or added to the worst-faring member. The difference is always 2. However, if we then measure social welfare by subtracting total welfare differences from total welfare, we get the following results: starting with  $\mathbf{v}_A = (3, 2, 1)$ , we get the welfare vectors  $\mathbf{v}_{Ab+} = (4, 2, 1)$ ,  $\mathbf{v}_{Ab-} = (2, 2, 1)$ ,  $\mathbf{v}_{Aw+} = (3, 2, 2)$  and  $\mathbf{v}_{Aw-} = (3, 2, 0)$  and the values:  $W(A) = 6 - 4 = 2$ ,  $W(A^{b+}) = 7 - 6 = 1$ ,  $W(A^{b-}) = 5 - 2 = 3$ ,  $W(A^{w+}) = 7 - 2 = 5$  and  $W(A^{w-}) = 5 - 6 = -1$ .

Since the absolute difference in social welfare when the best-faring member gains or loses welfare is 1, but the absolute difference in social welfare when the worse-faring member gains or loses welfare is 3, welfare changes for the worse-faring members affect social welfare more, even according to this measure. (If we would divide total welfare with total welfare differences we would get the same result.)

#### 4. THE ARGUMENT FROM MINIMAL CONDITIONS

The second argument for the thesis that egalitarians and prioritaricians can use the same measures focuses on how the measures should rank possible populations in order to capture the core egalitarian and prioritarian ideas. The argument is that there is no difference between egalitarian and prioritarian measures in this respect.

In order to assess how the two theories should rank possible populations, I will begin this section by formulating two ranking conditions, one for egalitarian and one for prioritarian measures. Let us look at the egalitarian ranking condition first.

<sup>16</sup> See Rabinowicz, "The Size of Inequality and Its Badness," 62.

#### 4.1. The Egalitarian Condition

An egalitarian measure should rank populations in a way that reflects that inequality affects social welfare negatively. For many comparative cases egalitarians would disagree as to which population is most unequal. The following ranking condition, however, should be generally acceptable:

*Egalitarian Condition:* For a measure of social welfare  $W$  and for all possible populations  $A$  and  $B$  and their members  $p_i \in A$  and  $q_i \in B$ , such that  $|A| = |B|$  and  $\Sigma w(p_i) = \Sigma w(q_i)$ , if there is a bijection from  $A$  to  $B$ , such that each individual  $p_i \in A$  could be paired with an individual  $q_i \in B$  so that for each pair of individuals  $(p_i, q_i)$  it is the case that  $w(p_i) = w(q_i)$ , except for four individuals:  $p_1, p_2, q_1, q_2$ , such that  $|w(p_1) - w(p_2)| < |w(q_1) - w(q_2)|$ , then  $A$  does better than  $B$ , and thus  $W(A) > W(B)$ .

Less formally, the condition states that if the total welfare and cardinality are equal between two populations, and all individual welfare values are equal, apart from the welfare of one pair of persons, the population with the more equal-faring pair is better.

The Egalitarian Condition is most similar to the well-known *Pigou-Dalton Condition* (although this condition concerns welfare transfers and outcomes).<sup>17</sup> It is also slightly similar to *Hammond's Equity Condition* (although that condition does not require the same total sum).<sup>18</sup> The first similarity will be relevant later.

The Egalitarian Condition is a restricted condition in the sense that it applies only to comparisons between two populations that are similar in all respects except for the welfare of one pair of persons, where one pair fares more equally than the other. However, assuming that *better-than* is a transitive relation, the condition implies that for comparisons between populations with the same cardinality and total welfare, the population where everyone fares equally well is the best population. The condition also implies that, for the same comparison, the population where one person has all welfare and the others have none is the worst population.

I take it that the Egalitarian Condition is *necessary* for a social welfare measure to qualify as egalitarian. This idea would be entirely uncontroversial if the condition concerned only comparisons between populations of two persons. Since it does not, someone might object that whether  $A$  should be regarded as more equal than  $B$  depend on the welfare levels of the persons not being com-

17 See Pigou, *Wealth and Welfare*, 27; and Dalton, "The Measurement of the Inequality of Incomes," 351.

18 See Hammond, "Equity, Arrow's Conditions, and Rawls' Difference Principle," 795.

pared. If the other persons in  $A$  and  $B$  seem to fare more like  $q_1$  and  $q_2$  than like  $p_1$  and  $p_2$ , perhaps  $B$  should be regarded as more equal than  $A$  (for example, when the welfare values in  $A$  are  $(8, 5, 4, 1)$  and the welfare values in  $B$  are  $(8, 8, 1, 1)$ ).

To this objection one may reply that the inequality resulting from the larger difference between  $q_1$  and  $q_2$  simply cannot be compensated for by similar or equal differences between the other members of  $B$ . This point is most clearly illustrated by looking at welfare differences. In the above example, the welfare differences between the welfare levels of the members of  $B$  are larger than they are between the members of  $A$ . Even though the welfare levels 8 and 1 seem to be more similar to the levels 8 and 1 than the levels 5 and 4 seem to be, they are overall more different. This fact does not conclusively show that  $A$  is more equal than  $B$ , since the relationship between welfare differences and inequality may be more complicated than mere aggregation. However, considering that welfare differences ground inequality, this fact strongly supports the claim that  $A$  is more equal than  $B$ .

Let us thus proceed to consider whether the Egalitarian Condition is also *sufficient* for a social welfare measure to qualify as egalitarian (assuming that we are only considering measures that could qualify as social welfare measures at all). In order to support the claim that it is sufficient, we could argue that a social welfare measure that satisfies the condition cannot rank populations in an obviously non-egalitarian way. This argument requires, for a start, that we identify all obviously non-egalitarian rankings of populations (including populations that differ from one another in size and total welfare). Since there are many different ways to measure inequality, the only obviously non-egalitarian rankings (besides the ones directly contradicting the condition) are the extreme ones, that is: the maximal and minimal equality cases. Similar comments apply to both, so let us focus on the minimal case.

One might think that an obviously non-egalitarian ranking would be one where a population in which one person has all welfare and the rest have none is ranked above a population in which this is not the case. However, this is too quick. It is not obviously non-egalitarian to make this kind of ranking because an egalitarian may care about factors other than equality, such as total amount of welfare, average level of welfare, or number of well-faring people. Thus, even an egalitarian may rank  $(20, 0)$  above  $(0, 0)$  or  $(0)$ , for example.

The only obviously non-egalitarian minimal equality ranking is thus the one where, *everything else being equal* (total welfare and size of population), a population in which one person has all welfare and the rest have none is ranked above a population where this is not the case. Likewise: the only obviously non-egalitarian maximal equality ranking is the one where, *everything else being equal*, a population where all persons have the same amount of welfare is ranked below

a population where this is not the case. And both of these rankings are excluded by the Egalitarian Condition.

If I am correct that there are no other obviously non-egalitarian social welfare rankings, then the Egalitarian Condition is both sufficient and necessary for identifying a social welfare measure as egalitarian.

#### 4.2. The Prioritarian Condition

A prioritarian measure should rank populations in a way that reflects that welfare changes for the worse-faring individuals affect social welfare more. The following ranking condition should be uncontroversial:

*Prioritarian Condition:* For a measure of social welfare  $W$  and for any possible population  $C$  and for any individuals  $r_i, s_i \in C$  such that  $w(r_i) < w(s_i)$  and  $w(r_i) \geq 0$  and  $w(s_i) \geq 0$ , if it is possible to either increase the welfare of  $r_i$  by  $m$ , resulting in population  $C^*$ , or increase the welfare of  $s_i$  by  $m$ , resulting in population  $C^{**}$ , then  $C^*$  does better than  $C^{**}$  and thus  $W(C^*) > W(C^{**})$ .

Less formally, the condition states that given the choice between increasing the welfare of either of two persons by the same amount, it is better to increase the welfare of the worse-off person.

The Prioritarian Condition is a variant of the Pigou-Dalton Condition (mentioned earlier).<sup>19</sup> It is also similar to conditions previously proposed by Sen, Weirich, Parfit, and Vallentyne.<sup>20</sup> Because the Prioritarian Condition only applies to comparisons between two possible populations that result from changes to the same population, it has a rather limited application.

That the Prioritarian Condition is *necessary* for a social welfare measure to qualify as prioritarian seems indisputable.<sup>21</sup> If a measure would not give the result that it would be better to increase the welfare of a worse-off person by  $m$ , rather than a better-off person by the same amount  $m$ , then it would not be prioritarian. It is less obvious that the Prioritarian Condition is also *sufficient* for a social welfare measure to qualify as prioritarian (even if we, once again, only

19 See Pigou, *Wealth and Welfare*, 27; and Dalton, "The Measurement of the Inequality of Incomes," 351.

20 See Sen, *On Economic Inequality*, 18; Weirich, "Utility Tempered with Equality," 431; Parfit, "Equality and Priority," 213; and Vallentyne, "Equality, Efficiency and the Priority of the Worse-Off," 1.

21 Temkin, Tungodden, Adler, Fleurbaey, and McCarthy agree. See Temkin, *Inequality*, 64; Tungodden, "The Value of Equality," 28, and "Equality and Priority," 424; Adler, *Well-Being and Fair Distribution*, 356; Fleurbaey, "Equality versus Priority," 207; and McCarthy, "Risk-Free Approaches to the Priority View," 432.

consider measures that could qualify as social welfare measures at all). In order to support the claim that it is sufficient, we can use the same type of reasoning as in the egalitarian case: we can argue that a measure that satisfies the condition cannot rank possible population changes in an obviously non-prioritarian way. This argument requires identifying all obviously non-prioritarian rankings of possible changes. There are three candidates for such non-prioritarian rankings.

The first possibly (or rather obviously) non-prioritarian ranking is one where an increase in the welfare of a better-off person by  $m$  is preferred over an increase of the welfare of a worse-off person by  $m$ . This ranking is directly excluded by the Prioritarian Condition.

The second possibly non-prioritarian ranking is one where an increase in the welfare of a better-off person by a higher amount  $n$  is preferred over an increase of the welfare of a worse-off person by a lower amount  $m$ . But this ranking is not obviously non-prioritarian. It does not go against prioritarianism generally to regard an increase of total welfare or average welfare as more important than prioritizing the worse-faring person (for example by choosing  $(8, 4)$  rather than  $(5, 6)$  as a change from  $(5, 4)$ ).

The third possibly non-prioritarian ranking is one where an increase in the welfare of a better-off person by a lower amount  $m$  is preferred over an increase of the welfare of a worse-off person by a higher amount  $n$ . This type of ranking can be separated into two cases. In the first case, the addition of  $n$  to the welfare of a worse-faring person does not make that person better off than the better-faring person. In the second case, the addition of  $n$  to the welfare of a worse-faring person does make that person better off than the better-faring person.

When the addition of  $n$  to the welfare of a worse-faring person does not make the worse-faring person better off than the better-faring person, the third type of ranking is obviously non-prioritarian. However, this ranking is excluded by the Prioritarian Condition being consecutively applied to hypothetical choices. Choosing between increasing the welfare of a better-faring person by a lower amount  $m$  and increasing the welfare of a worse-faring person by a higher amount  $n = m + k$ , can be described as first hypothetically choosing between increasing the welfare of either a worse-faring or a better-faring person by  $m$ , and then hypothetically choosing between increasing the welfare of either a worse-faring or a better-faring person by  $k$ . For both choices the condition will reward raising the worse-faring rather than the better-faring person, and thus reward raising the worse-faring person by  $n$ . (The choice of  $(5, 5)$  over  $(6, 3)$ , from  $(5, 3)$  is thus done, first by choosing  $(5, 4)$  over  $(6, 3)$  and then by choosing  $(5, 5)$  over  $(6, 4)$ .)

When the addition of  $n$  to the welfare of a worse-faring person does make the

worse-faring person better off than the better-faring person, the third type of ranking is not obviously non-prioritarian. This is because it is not clear that we are prioritizing the better-faring person, when during the change, the better-faring person *becomes* the worse-faring person. Thus: while it is obviously non-prioritarian to rank  $(6, 3)$  as a better change than  $(5, 5)$  from  $(5, 3)$ , it is not obviously non-prioritarian to rank  $(6, 3)$  as a better change than  $(5, 9)$  from  $(5, 3)$ , for example.

Since the Prioritarian Condition excludes two obviously non-prioritarian rankings, and there are no other obvious such rankings, the condition is plausibly sufficient for identifying a social welfare measure as prioritarian as well.

The conclusion of this section is thus that the Egalitarian Condition is both necessary and sufficient for a social welfare measure to qualify as egalitarian, whereas the Prioritarian Condition is both necessary and sufficient for a social welfare measure to qualify as prioritarian. However, as might be obvious, the two conditions are equivalent. (A proof of this is included in the appendix.) Thus, since the Egalitarian Condition is both necessary and sufficient to identify an egalitarian social welfare measure and the Prioritarian Condition is both necessary and sufficient to identify a prioritarian social welfare measure, and the two conditions are equivalent, then any social welfare measure qualifying as egalitarian will also qualify as prioritarian, and vice versa.

## 5. THE ARGUMENT FROM STANDARD MEASURES

Someone may object to the above analysis, however, that the minimal conditions present the theories as too abstract. The differences between the two theories and their measures would be more clearly visible if we looked at standard egalitarian and prioritarian measures directly.

This possible objection leads me to the third argument for the thesis that egalitarians and prioritarians can use the same measures: both theories can use the same *standard* egalitarian and prioritarian measures. To show this, I will first present the measures and then argue that they could be used for either theory. (Both measures satisfy the minimal conditions.)

### 5.1. A Standard Prioritarian Measure

Let us first consider a standard type of prioritarian measure. It is not the only prioritarian measure in the literature, but it is often presented as *the* prioritarian measure.<sup>22</sup> It measures social welfare by aggregating individual welfare through a strictly concave function, as follows:

22 See Rabinowicz, "Prioritarianism for Prospects," 8–9; Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 99; Brown, "Prioritarianism for

$$PW(A, w) = \sum_{i=1}^n f(w(p_i)),$$

where  $A$  is a population,  $w$  is a measure of individual welfare,  $n = |A|$ ,  $f$  is a strictly concave function, and  $p_i$  is an indexed individual such that  $p_i \in A$ .

Since the concave function is not specified above, the  $PW$  measure is, strictly speaking, a class of measures. Let me give an example of how a  $PW$  measure might work. If the strictly concave function is a root function, and some population  $A$  only has four members, with their welfare levels represented by the vector  $\mathbf{v}_A = (9, 16, 0, 4)$ , then  $PW$  would assign  $A$  the social welfare value  $3 + 4 + 0 + 2 = 9$ . By comparison, the population  $B$  with the vector  $\mathbf{v}_B = (0, 25, 0, 4)$  would be assigned the social welfare value 7, and would thus be lower ranked.

The  $PW$  measure is considered suitable for prioritarianism since it gives lower welfare values larger weight, thus giving welfare changes for the worse-faring people larger weight as well.

### 5.2. A Standard Egalitarian Measure

Let us next consider a standard type of egalitarian measure. There is no egalitarian measure known as *the* egalitarian measure, so as a standard egalitarian measure I will choose a mixture of several previous proposals. Its general form is similar to measures proposed by Jensen, Fleurbaey, and Peterson and Hansson, and illustrates the common idea that an egalitarian measure should incorporate a measure of equality, multiplied or added to a measure of individual welfare.<sup>23</sup> The form of the measure is as follows:

$$EW(A, w) = \sum_{i=1}^n w(p_i)(1 - I(A, w)),$$

where  $A$  is a population,  $w$  is a measure of individual welfare,  $n = |A|$ ,  $p_i$  is an indexed individual such that  $p_i \in A$ , and  $I$  is a measure of inequality such that  $0 \leq I(A, w) \leq 1$ .

The  $EW$  measure multiplies the total sum of individual welfare with a measure of equality ( $E(A, w) = 1 - I(A, w)$ ). Because there are several measures of inequality that can be used for  $I$ , the  $EW$  measure is a class of measures as well.<sup>24</sup> For the measure to satisfy the Egalitarian Condition, the inequality measure should take

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Variable Populations," 330; Holtug, *Persons, Interests, and Justice*, 205; Adler, *Well-Being and Fair Distribution*, 307; Hirose, *Egalitarianism*, 89; and Broome, "Equality versus Priority," 221.

23 See Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 94; Fleurbaey, "Equality versus Priority," 207–8; and Peterson and Hansson, "Equality and Priority," 307.

24 See for example inequality measures by Gini, "Variabilità e mutabilità"; Pietra, "Delle Relazioni tra gli Indici di Variabilità"; and Theil, *Economics and Information Theory*.

differences between all members into account (as opposed to, for example, just the best- and the worst-faring member). I will use a very simple inequality measure here, based on a measure proposed by Rabinowicz and Arrhenius.<sup>25</sup> The inequality  $I(A, w)$  will be defined as the ratio between the total sum of welfare differences between the individuals in  $A$  and the total sum of welfare differences of  $A_U$ , which is the maximally unequal possible population that has the same cardinality and total welfare as  $A$  (more precisely,  $|A_U| = |A|$ , and if  $q_i \in A_U$  and  $p_i \in A$ , then  $\sum w(q_i) = \sum w(p_i)$ , and for one individual  $q_1$ ,  $w(q_1) = \sum w(q_i)$ ). The measure  $I(A, w)$  is thus a proportional measure:

$$I(A, w) = \frac{D(A, w)}{D(A_U, w)},$$

where

$$D(A, w) = \frac{\sum_{i=1}^n \sum_{j=1}^n |w(p_i) - w(p_j)|}{2},$$

where  $A$  and  $A_U$  are populations ( $A_U$  defined above),  $w$  is a measure of individual welfare,  $n = |A|$ , and  $p$  is an individual, such that  $p \in A$  (indexed twice as  $p_i$  and  $p_j$ ).

One may note that  $0 \leq I(A, w) \leq 1$ , and that  $D(A_U, w) = \sum w(p_i)(n - 1)$ .

Instead of using  $I(A, w)$  as defined above, we could also use the well-known *Gini Inequality Measure* in the egalitarian measure.<sup>26</sup> In terms of construction, this means that we would use something similar to  $D(A, w)$ , exchanging 2 in the denominator for  $2n^2\mu$  (where  $\mu$  is the mean value of  $w(p_i)$ , that is  $(1/n)\sum_{i=1}^n w(p_i)$ ), for the inequality measure. This version of the *EW* measure would also satisfy the Egalitarian Condition and has similar properties to the presented measure (apart from satisfying the *Pareto Condition*). Since it is less of a contrast to the *PW* measure, I will not focus on this version of the *EW* measure here, however.

### 5.3. Double Uses for the Two Measures

The *EW* and *PW* measures differ most fundamentally in their structure. The *PW* measure is an additively separable strictly concave function on individual welfare values, whereas the *EW* measure is a product measure of two factors, where one factor is the total sum of individual welfare and the other factor is a measure of equality. As a result, absolute levels of individual welfare determine the degree to

25 See Rabinowicz, "The Size of Inequality and Its Badness," 62; and Arrhenius, "Egalitarian Concerns and Population Change," 79.

26 See Gini, "Variabilità e mutabilità."

which individual welfare contributes to social welfare for the *PW* measure, whereas degrees of inequality determine the degree to which total welfare contributes to social welfare for the *EW* measure (where in cases of maximal equality, social welfare is equal to the total sum and in cases of minimal equality, social welfare is 0).

The two measures seem to capture their respective theory perfectly: the *PW* measure gives changes of lower welfare values larger weights, as is suitable for prioritarianism, while the *EW* measure gives inequality a negative weight, as is suitable for egalitarianism. However, this does not mean that each measure can be used for only one theory. In fact, both measures seem to work for both theories.

The *PW* measure gives lower welfare larger weights and thus gives changes for people with lower welfare larger weights, as is appropriate for prioritarianism. But by giving lower welfare larger weight, inequality is punished in comparison to equality, and thus the measure is appropriate for egalitarianism as well. In fact, the *PW* measure shows up in the literature both as a prioritarian and as an egalitarian measure. Holtug, Hirose, and Broome present the measure as prioritarian, while Sen, Weirich, and (an earlier) Broome present the measure as egalitarian.<sup>27</sup> If I am correct that any measure that can be used by one theory can be used by the other, this double use is entirely appropriate. (Leximin has the same type of double use.)<sup>28</sup>

The *EW* measure is in part a function of a measure of equality, so it is appropriate for egalitarianism. But it may be appropriate for prioritarianism as well—at least the personal version.<sup>29</sup> Let me explain this idea.

The *EW* measure may be regarded as appropriate for egalitarianism since it represents the idea that it matters for social welfare whether individuals fare equally. However, the measure may also be regarded as appropriate for prioritarianism, since it also represents the idea that the worse-off individuals matter more for social welfare. Just like the egalitarian idea can be represented by multiplying an *equality* value with the total sum of welfare, the prioritarian idea can be represented by multiplying an aggregated *lack of worse faring* value with the total sum of welfare. For the *EW* measure to work both as an egalitarian and a prioritarian measure, it thus suffices to show that both equality and aggregated

27 See Holtug, *Persons, Interests, and Justice*, 205; Hirose, *Egalitarianism*, 89; Broome, “Equality versus Priority,” 221; Sen, *On Economic Inequality*, 20; Weirich, “Utility Tempered with Equality,” 433; and Broome, *Weighing Goods*, 179.

28 For example, leximin has been proposed as a prioritarian measure by Arneson, “Luck Egalitarianism and Prioritarianism,” 341; Crisp, “Equality, Priority, and Compassion,” 752; and Esposito and Lambert, “Poverty Measurement,” 117; and as an egalitarian measure by Hammond, “A Note on Extreme Inequality Aversion,” 465–66; Tungodden, “The Value of Equality,” 14; and Bosmans, “Extreme Inequality Aversion without Separability,” 592.

29 It is, in fact, similar to a prioritarian measure proposed by Fleurbaey, “Equality versus Priority,” 207–8.

lack of worse faring can be measured by the measure  $1 - I(A, w)$ , and thus that both inequality and aggregated worse faring can be measured by  $I(A, w)$ . It is easy to show that they can. First we may note that we could measure aggregated worse faring by summing the welfare differences between the worse-faring and the better-faring persons. If we do, we would get a measure that is equivalent to  $D(A, w)$ , since  $D(A, w)$  aggregates all welfare differences but divides them by two, and counts the welfare differences between equally well-faring persons as zero. Thus,  $D(A, w)$  works just as well as a measure of aggregated worse faring as it works as a measure of inequality. Since  $I(A, w)$  is just a function of the measure  $D(A, w)$ , it works just as well as a measure of proportional worse faring as it works as a measure of proportional inequality. And since  $EW(A, w)$  is just a function of  $I(A, w)$  and the total sum of welfare, it works just as well as a prioritarian measure as it works as an egalitarian measure. (Had we used the Gini Inequality Measure instead of  $I(A, w)$ , we could have used the fact that the Gini measure is  $D(A, w)$  multiplied by  $1/n^2\mu$  to make the same argument.)

Thus, both measures seem to work as egalitarian and as prioritarian measures of social welfare. Both of them capture the ideas that inequality and worse faring have a negative effect on social welfare and both of them reward lack of inequality and improvements for worse-faring persons more than improvements for better-faring persons.

## 6. ARGUMENTS FROM OTHER CONDITIONS AND FEATURES

However, one may object to the above analysis by pointing out that there are other important differences between the two standard measures that could reflect important differences between egalitarianism and prioritarianism as well. Three such features that could be used to distinguish the two types of measures are: pareto satisfiability, level sensitivity, and relationality (closely related to non-separability).

The first property has to do with the importance of individual welfare increases for social welfare. A measure that satisfies Pareto evaluates all welfare increases as good. The property thus reflects the idea that it is more important that each individual fare as well as possible than that total welfare has a certain distribution (such as everyone faring equally well or the worse-off individuals faring better). The *PW* measure satisfies Pareto, whereas the *EW* measure does not.

The second property has to do with the importance of absolute levels of welfare for the badness of inequality (or worse faring) for social welfare. A level-sensitive measure reflects the idea that it is worse for social welfare with inequality

(or worse faring) at lower levels of welfare. The *PW* measure is level sensitive, whereas the *EW* measure is not.

The third property has to do with the importance of relations between the welfare levels of different individuals to social welfare. A relational measure reflects the idea that welfare differences between individuals by themselves negatively affect social welfare (as a separate factor). The *EW* measure is relational, whereas the *PW* measure is not.

The property of relationality is closely related to a fourth property: non-separability. A separable measure assesses the contribution to social welfare from each member of a population independently of all other members of the population (which excludes relationality).<sup>30</sup> The *PW* measure is separable, whereas the *EW* measure is not.

The first three properties are independent of one another, and thus there are eight different possible combinations of them and their opposites. I will not discuss all combinations here, however. Instead I will ask for each one of the three properties whether both egalitarianism and prioritarianism can incorporate the property in question as well as its opposite. (The fourth property will be discussed together with the third, as they are closely related.)

My final three arguments for the thesis that egalitarians and prioritarians can use the same measures are that it seems reasonable for each of the three properties that both egalitarian and prioritarian measures can incorporate the property as well as its opposite. (These arguments can be regarded as counterarguments to arguments that there is some property that can distinguish between egalitarian and prioritarian measures.)

### 6.1. *The Argument concerning Pareto Satisfaction*

A first proposal for distinguishing between prioritarian and egalitarian measures is to suggest that a prioritarian measure should satisfy a Pareto condition and that an egalitarian measure should not. This is similar to a proposal by Parfit who claimed that a prioritarian must accept Pareto, but that an egalitarian need not.<sup>31</sup> Both proposals can be illustrated by the fact that the *PW* measure satisfies the condition and the *EW* measure does not.

30 Sen claims that relationality excludes separability (*On Economic Inequality*, 41). Adler and McCarthy claim that the distinction between relational and non-relational social welfare measures should be understood as the distinction between non-separable and separable social welfare measures; see Adler, *Well-Being and Fair Distribution*, 363; and McCarthy, "Risk-Free Approaches to the Priority View," 431.

31 See Parfit, "Equality or Priority?" 118. Tungodden agrees with the claim about prioritarians ("The Value of Equality," 28).

The Pareto Condition states that increasing individual welfare is invariably good, and thus implies that increasing individual welfare is more important than retaining equality. It may be put as follows:

*Pareto Condition:* For a measure of social welfare  $W$  and for any possible population  $A$  and for any individual  $p_i \in A$ , whose welfare is represented by the individual welfare function  $w$ , if  $A^*$  would result from raising the welfare of at least one  $p_i$ , without lowering the welfare of any  $p_i$ , then  $A^*$  does better than  $A$ , and thus  $W(A^*, w) > W(A, w)$ .<sup>32</sup>

The *PW* measure would never rank  $A^*$  below  $A$  since it is a strictly increasing function on individual welfare values. But the *EW* measure might rank  $A^*$  below or equal to  $A$ , when the degree of inequality is larger in  $A^*$  than in  $A$ . (For example, when  $(1, 1)$  becomes  $(2, 1)$ , the *EW* measure gives both populations a value of 2.)

The Pareto Condition is related to other conditions that have been discussed in the same context, such as the *Dominance Condition*, which states that a population that dominates another in terms of individual welfare is better. All such related conditions reflect the same idea: that it is more important for social welfare that each individual fare as well as possible than it is that individuals fare equally well. A measure that does not satisfy these conditions faces the leveling-down objection: the critique that a measure should not rank welfare losses as improvements, even when the losses result in everyone faring more equally. (This objection could be put either in terms of overall improvements or in terms of one-aspect improvements. Because a measure only registers overall improvements, only the first critique is relevant for the purpose of measurement.)<sup>33</sup>

The question here is whether egalitarians should reject Pareto, while prioritarians should accept it. One possible answer is that egalitarians should reject Pareto because equality must at some point be more important than raising individual welfare, if it should be of sufficient importance for an egalitarian. Prioritarians, however, can accept Pareto because welfare changes for worse-off people can have a sufficiently large weight without it being a problem that the welfare levels of better-off people are raised.

However, this argument is unconvincing. If accepting Pareto would give equality insufficient weight, there is no reason to think that it would not also give changes for the worse-faring people insufficient weight. And if accepting Pareto would give changes for the worse-faring people sufficient weight, there

32 The Pareto Condition was first proposed by Pareto. See Pareto, *Manuel d'Economie Politique*, 33. The condition is similar to Broome's *Principle of Personal Good* (*Weighing Goods*, 165).

33 A similar objection was first brought up by Nozick, *Anarchy, State, and Utopia*, 229. See also Parfit, "Equality or Priority?" 105.

is no reason to think that it would not also give equality sufficient weight. For both theories, accepting Pareto has consequences. An egalitarian would have to accept that some equality losses make a population better, as when  $\mathbf{v}_A = (1, 1, 1, 1)$  becomes  $\mathbf{v}_A^* = (4, 1, 1, 1)$ . A prioritarian, in turn, would have to accept that sometimes it is better to give smaller benefits to better-faring persons than larger to worse-faring persons, as when  $\mathbf{v}_A^*$  is preferably changed into  $\mathbf{v}_A^{**} = (9, 4, 1, 1)$  rather than into  $\mathbf{v}_A^{***} = (4, 8, 1, 1)$ .

Another argument to the same effect is that an egalitarian should consider inequality equally bad, no matter its direction (relative to an equal-faring majority), and a prioritarian should not. Thus, an egalitarian should consider a population  $A$  with the welfare vector  $\mathbf{v}_A = (2, 1, 1, 1)$  to be equally good as a population  $B$  with a welfare vector  $\mathbf{v}_B = (1, 1, 1, 0)$ , whereas a prioritarian should consider  $B$  to be worse. Since Pareto requires that  $A$  is ranked above  $B$ , an egalitarian must reject it.

But this argument is unconvincing as well. It presupposes that an egalitarian would not consider individual welfare important in addition to equality, and there are no egalitarians like that. (Why would an egalitarian consider equality of individual welfare good for social welfare if she did not consider individual welfare good for social welfare in itself?)<sup>34</sup> Even though an egalitarian (let us suppose) would consider  $A$  and  $B$  equally good in terms of *inequality*, an egalitarian need not consider  $A$  and  $B$  equally good *overall*. And overall goodness is the only thing that a social welfare measure registers.

Obviously, satisfaction of the Pareto Condition could be proposed as a dividing line between egalitarianism and prioritarianism. However, it has already been used as a dividing line between different kinds of egalitarianism: *strong egalitarianism* that does not satisfy Pareto and *moderate egalitarianism* that does.<sup>35</sup> Since moderate egalitarianism is accepted as a kind of egalitarianism, and is also much more popular than the strong kind, it seems inappropriate to distinguish between egalitarianism and prioritarianism on the basis of Pareto. In fact, considering that the Pareto Condition is often treated as a necessary condition for a plausible social welfare measure, one could even argue that using Pareto as a dividing line between egalitarianism and prioritarianism would give prioritarianism an unfair (and unwarranted) advantage.<sup>36</sup> (Tungodden, Christiano and

34 Compare McCarthy, "Distributive Equality," 1047.

35 See Parfit, "Equality and Priority," 218.

36 For the claim about Pareto being a necessary condition, see Deschamps and Gevers, "Leximin and Utilitarian Rules," 144; Blackorby, Bossert, and Donaldson, "The Axiomatic Approach to Population Ethics," 346; and Tungodden, "The Value of Equality," 18. Compare Broome, *Weighing Goods*, 200.

Brayen, Holtug, Hirose and Broome all think that egalitarians should accept Pareto. Only Nagel and (perhaps) Temkin think that egalitarians need not.)<sup>37</sup>

### 6.2. The Argument concerning Level Sensitivity

A second proposal for distinguishing between prioritarian and egalitarian measures is to suggest that a prioritarian measure should be sensitive to *absolute levels* of welfare and that an egalitarian measure should not, so that worse faring is represented as worse at lower levels, but inequality is not. This is illustrated by the fact that the *PW* measure gives larger weight to welfare changes for worse-off persons at lower welfare levels, whereas the *EW* measure gives the same weight to inequality at any welfare level. Thus, only the *PW* measure satisfies the following condition:

*Level-Sensitivity Condition:* For a measure of social welfare  $W$  and for any possible populations  $A, B, C, D$  with just two members, and their members:  $p_i \in A, q_i \in B, r_i \in C$  and  $s_i \in D$ , whose welfare is represented by the individual welfare function  $w$ , if  $\sum w(p_i) = \sum w(q_i)$  and  $\sum w(r_i) = \sum w(s_i)$ , and  $A$  and  $C$  are equal populations because  $w(p_1) = w(p_2)$ , and  $w(r_1) = w(r_2)$ , whereas  $B$  and  $D$  are unequal populations because  $w(q_1) > w(q_2)$  and  $w(s_1) > w(s_2)$ , and  $|w(q_1) - w(q_2)| = |w(s_1) - w(s_2)|$ , but  $w(q_1) > w(s_1)$ , then  $|W(A, w) - W(B, w)| < |W(C, w) - W(D, w)|$ .

The distinction between level sensitivity and level insensitivity has previously been brought up by both Temkin and Rabinowicz in a discussion regarding the badness of inequality.<sup>38</sup>

For a measure that satisfies the Level-Sensitivity Condition, the loss of social welfare due to inequality (or worse-off people) is worse at lower levels of welfare. Thus, the loss of social welfare for  $B$ , in comparison to  $D$ , is worse than the loss of welfare for  $A$ , in comparison to  $C$ , when the members of  $B$  fare worse than the members of  $A$ .

The strict concavity of the *PW* measure assures that the difference between  $W(A, w)$  and  $W(C, w)$  is always smaller than the difference between  $W(B, w)$  and  $W(D, w)$ . However, for the *EW* measure the difference between these values is always the same.

Even though we can distinguish between the *PW* measure and the *EW* mea-

37 See Tungodden, "The Value of Equality," 18; Christiano and Brayen, "Inequality, Injustice, and Levelling Down," 392; Holtug, *Persons, Interests, and Justice*, 171; Hirose, "Reconsidering the Value of Equality," 306; Broome, "Equality versus Priority," 220; Nagel, *Equality and Partiality*, 107; and Temkin, *Inequality*, 78.

38 See Temkin, "Equality, Priority, or What?" 160; and Rabinowicz, "The Size of Inequality and Its Badness," 67.

sure relative to their level sensitivity, it seems unsuitable to distinguish between egalitarianism and prioritarianism in this way. On the one hand, both egalitarians and prioritarians care about how people fare, and obviously think that lower levels of welfare are worse. It is a natural extension of this idea that also inequality or worse faring is worse at lower levels. On the other hand, it is not a necessary extension of this idea, so an egalitarian could also hold that inequality is equally bad no matter how well people fare, and at least a *personal* prioritarian could hold that worse faring is equally bad no matter how well people fare. It is thus perfectly possible to formulate either egalitarianism or prioritarianism as either level-sensitive or level-insensitive theories. In fact, this has already been done. Temkin has proposed a level-sensitive version of egalitarianism, while Hirose has presented a level-insensitive version.<sup>39</sup> As far as prioritarianism is concerned, Parfit's version is level sensitive, whereas Buchak's version is level insensitive.<sup>40</sup>

Considering that both egalitarianism and prioritarianism come in level-sensitive and level-insensitive versions, it would be inappropriate to distinguish between egalitarianism and prioritarianism on the basis of level sensitivity.

### 6.3. *The Argument concerning Relationality and Separability*

A third proposal for distinguishing between prioritarian and egalitarian measures is to suggest that an egalitarian measure should be responsive to *relations* between welfare levels of different persons and that a prioritarian measure should not. This is illustrated by the *EW* measure being a function of relations between different welfare levels, which the *PW* measure is not. The *EW* measure is thus *relational* while the *PW* measure is not. Because of this, the *PW* measure represents each individual as contributing *separately* to social welfare, so that the contribution to social welfare from each member's welfare is independent of the welfare of the other members, whereas the *EW* measure represents each individual as contributing non-separately to social welfare, so that the contribution to social welfare from each member's welfare is dependent on the welfare of the other members. It is thus possible to change the welfare of a member  $p$  of some population  $A$  from  $w_1$  to  $w_2$  without this change affecting the value of  $PW(A, w)$  via anything other than the difference between  $w_1$  and  $w_2$ . This is not the case for  $EW(A, w)$ . The *PW* measure is thus *separable* while the *EW* measure is not. Only the *PW* measure satisfies the following condition:

*Separability Condition:* For a measure of social welfare  $W$  and for any

39 See Temkin, "Equality, Priority, or What?" 160; and Hirose, "Reconsidering the Value of Equality," 307.

40 See Parfit, "Equality and Priority," 213–14; and Sen, *Collective Choice and Social Welfare*, 138.

possible population  $A$  and all individuals  $p_i \in A$ , whose welfare levels are represented by the individual welfare function  $w$ , it is the case that if the welfare of an individual  $p_i \in A$  changes from  $w_1(p_i)$  to  $w_2(p_i)$ , and there are no other welfare changes for the members of  $A$ , then  $W_1(A, w) - W_2(A, w) = f(w_1(p_i), w_2(p_i))$ .

This condition implies that a change affecting only a subgroup of a population affects social welfare independently of the fixed situation of the rest of the population. The *PW* measure satisfies the condition because it is a function only of absolute welfare values, and not of welfare differences. The *EW* measure, being a function both of absolute welfare values and of welfare differences, fails to satisfy the condition.

To distinguish between egalitarianism and prioritarianism on the basis of relationality and separability is quite common. The idea that egalitarianism is relational while prioritarianism is not is held by Parfit, McKerlie, and Hirose.<sup>41</sup> The related idea that egalitarianism is non-separable while prioritarianism is not is held by Broome.<sup>42</sup>

As far as only egalitarianism is concerned, everyone agrees that egalitarianism is a relational theory (including Temkin, McKerlie, Parfit, and Holtug).<sup>43</sup> But not everyone agrees that egalitarianism must use a non-separable measure. Several philosophers think that egalitarianism could very well use a separable measure (including Tungodden, Fleurbaey, Jensen, and McCarthy).<sup>44</sup>

Concerning prioritarianism, opinions are more divided. Fleurbaey believes that prioritarianism should be regarded as a relational theory (“or it should have a different name”), whereas Parfit believes that it should be regarded as a non-relational theory (to which McKerlie and Holtug agree).<sup>45</sup> Persson proposes that prioritarianism could be regarded either as a relational or non-relational theory and makes a distinction between an *absolute priority view* and a *relational priority view* (as presented previously).<sup>46</sup> There are a number of philosophers who

41 See Parfit, “Equality or Priority?” 104; McKerlie, “Understanding Egalitarianism,” 53; and Hirose, *Egalitarianism*, 95.

42 See Broome, “Equality versus Priority,” 221.

43 See Temkin, “Equality, Priority, or What?” 138; McKerlie, “Equality and Priority,” 25; Parfit, “Equality and Priority,” 214; and Holtug, *Persons, Interests, and Justice*, 174.

44 See Tungodden, “The Value of Equality,” 15; Jensen, “What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?” 106; McCarthy, “Risk-Free Approaches to the Priority View,” 439–40; Fleurbaey, “Equality versus Priority,” 215; and Buchak, “Taking Risks behind the Veil of Ignorance,” 642.

45 See Fleurbaey, “Equality versus Priority,” 206; Parfit, “Equality and Priority,” 214; McKerlie, “Understanding Egalitarianism,” 53; and Holtug, *Persons, Interests, and Justice*, 204.

46 See Persson, “Equality, Priority and Person-Affecting Value,” 35.

claim that prioritarianism should use a separable measure (for example Jensen, Tungodden, Adler, and Broome).<sup>47</sup> However, Buchak disagrees and suggests that prioritarianism could use a non-separable measure.<sup>48</sup>

What should we make of all of this? The definitions given for prioritarianism and egalitarianism above present both theories as intrinsically dependent on relations, at least in the sense that both *faring unequally well* and *being worse faring* are relational properties. However, both theories have also been represented by non-relational and separable measures. Two questions thus arise. First, is there any sense in which egalitarianism or prioritarianism could be regarded as non-relational theories? Second, if not, is it unsuitable to represent either theory by a non-relational (and separable) measure?

Let us look at the first question. As far as egalitarianism is concerned, we cannot regard it as a non-relational theory. Inequality depends on the relation of *worse faring* and is intrinsically relational. Prioritarianism is different. Even though *worse faring* is a relation, we could regard prioritarianism as a non-relational theory, at least in some sense. Rather than interpreting the expression “being worse faring” personally, as referring to the relational property of being worse off than other people, we could interpret the expression impersonally, as referring to the property of being worse off than one would be at higher levels of welfare. Given this interpretation, prioritarianism would state that welfare changes for worse-faring people matter more for social welfare when the worse-faring people are further from some fixed higher level of welfare. This version is still a relational version of prioritarianism, but it is equivalent to a non-relational version, stating that the importance of individual welfare changes to social welfare depends on the absolute values of the levels changed. Thus, it is possible to formulate a version (or at least the equivalence of a version) of prioritarianism that does not refer to the relation of worse faring and thus can be regarded as a non-relational theory.

If prioritarianism could be regarded as either a relational or non-relational theory, the second question is interesting only in relation to egalitarianism: Considering that egalitarianism must be classified as a relational theory, is it possible for egalitarians to use a non-relational measure, such as the *PW* measure? This

47 See Jensen, “What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?” 106; Tungodden, “Equality and Priority,” 423; Adler, *Well-Being and Fair Distribution*, 311; and Broome, “Equality versus Priority,” 221.

48 See Tungodden, “The Value of Equality,” 15; Jensen, “What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?” 106; McCarthy, “Risk-Free Approaches to the Priority View,” 439–40; Fleurbaey, “Equality versus Priority,” 215; and Buchak, “Taking Risks behind the Veil of Ignorance,” 642.

question cannot be answered without a theory concerning what a measure of social welfare should do. Here I will consider two proposals.

The first proposal is that the sole function of a measure of social welfare is to mathematically represent quantitative relations between populations in terms of social welfare. In that case, any measure may be used as an egalitarian measure as long as it assigns appropriate values to populations (according to egalitarianism). To show that a non-relational measure, such as the *PW* measure, is inappropriate for egalitarianism requires finding some assignment of values by such a measure that is not egalitarian.

As far as I know, no one has attempted to show that the *PW* measure itself renders rankings that are inappropriate for egalitarianism. However, some have suggested that egalitarians and prioritarians will rank populations differently. A few of these suggestions do not give any concrete examples, and cannot really be assessed.<sup>49</sup> (If I am correct, no such examples can realistically be given.)<sup>50</sup> The only concrete proposal that has been generally discussed is a proposal by Broome. I will give a simplified version of it here.

Let us assume that we are to compare four different populations, *A*, *B*, *C*, and *D*, with the welfare vectors  $\mathbf{v}_A = (2, 2, 2, 2)$ ,  $\mathbf{v}_B = (4, 1, 2, 2)$ ,  $\mathbf{v}_C = (2, 2, 1, 1)$ ,  $\mathbf{v}_D = (4, 1, 1, 1)$ . According to Broome, prioritarianism implies that *A* is better than *B* if and only if *C* is better than *D*. The reason is that the only difference between *A* and *B* is the well-being of the first two people and this difference is exactly the same difference as that between *C* and *D*. However, an egalitarian might think that *A* is better than *B* because *A* is more equal than *B*, and that *D* is better than *C* because *D* has a higher total sum of individual welfare.<sup>51</sup>

However, it is far from obvious that a prioritarian and an egalitarian would reason in these diverging ways. The assumption that a prioritarian must rank *A* over *B* if and only if *C* is ranked over *D* presupposes that a prioritarian ranking must be separable, and this is questionable (as we have already seen). It is also questionable (and I think incorrect) that only an egalitarian could consider two properties important for social welfare and also that only an egalitarian could consider one of them more important in one case and less important in another, in what seems to be a rather unprincipled way.<sup>52</sup>

49 See Parfit, "Equality or Priority?" 105; McKerlie, "Equality and Priority," 26; and Hausman, "Equality versus Priority," 230.

50 Compare Fleurbaey, "Equality versus Priority," 209.

51 See Broome, "Equality versus Priority," 222–23. For a similar example, see Sen, *On Economic Inequality*, 41.

52 Peterson and Hansson contend that Broome's version of egalitarianism is too unspecific to be assessed ("Equality and Priority," 303).

To properly assess different rankings, one needs to formulate precise conditions that specify when rankings should be regarded as egalitarian or as prioritarian. As I discussed this earlier, and failed to find a difference in rankings, I will not pursue this topic further here.

Let us thus look at the second proposal. According to this proposal, a measure of social welfare should have a function besides correctly representing quantitative relations between populations. It should also reflect the intrinsic dependence relation between social welfare and inequality, or worse faring, in its very form.

The idea that a measure of social welfare should reflect intrinsic dependence relations needs to be specified. One way to understand it is that the measure of social welfare should be a derived measure, that is: a function of other functions that measure the properties on which social welfare intrinsically depends.<sup>53</sup> The *EW* measure, being a function of a measure of total welfare and a measure of equality, shows social welfare as intrinsically dependent on individual welfare and equality. The *PW* measure, being a function only of individual welfare, shows social welfare as intrinsically dependent only on individual welfare.<sup>54</sup>

This understanding seems too crude, however. The *PW* measure is not just a function of individual welfare. It is a function of weighted individual welfare, where lower welfare values have larger weight. Thus, it does not show social welfare as intrinsically a function only of individual welfare. Rather, it shows social welfare as a function of individual welfare and the diminishing marginal importance of individual welfare (or some property like this). If we consider the diminishing marginal importance of individual welfare to be a prioritarian property, then the *PW* measure could at least be suitable for impersonal prioritarianism (although it would not be suitable for personal prioritarianism or egalitarianism).

There is something odd about the second proposal, however. Why should a measure reflect intrinsic dependency relations in its very form? It can hardly be for purely pedagogical reasons. But then the only explanation seems to be that a measure must reflect intrinsic dependency relations in order to accurately measure social welfare. And this leads us back to the first explanation. If the ability of a measure to reflect intrinsic dependence relations determines its ability to measure social welfare, then the *EW* measure could be used both for egalitari-

53 This idea is presented (but not endorsed) by Jensen as an interpretation of an egalitarian idea of Temkin's. See Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 94.

54 Some philosophers have insisted that an egalitarian social welfare measure should not be an additively separable function on individual welfare values—for example Jensen, "What Is the Difference between (Moderate) Egalitarianism and Prioritarianism?" 108; and Broome, "Equality versus Priority," 221. Both Tungodden ("The Value of Equality," 16) and Fleurbaey ("Equality versus Priority," 215) disagree, however.

anism and the personal version of prioritarianism, while the *PW* measure could at most be used for the impersonal version of prioritarianism. However, there is little reason to think that the ability of a measure to reflect intrinsic dependence relations determines its ability to represent the social welfare of populations since measures cannot distinguish between intrinsic and instrumental dependence relations. What matters for measurement is not intrinsic dependence, but *necessary covariation*. Despite their structural differences, both the *PW* measure and the *EW* measure are able to rank populations according to both egalitarian and prioritarian ideas. The non-relational *PW* measure is sensitive to inequality, which is a relational property, and the relational *EW* measure is affected more by changes to worse-faring people, even if they are impersonally worse faring.

## 7. CONCLUSION

In this essay I have discussed whether egalitarianism and prioritarianism must use different social welfare measures. I have argued that they need not, because: (1) conceptual connections between equality and worse faring are such that any egalitarian measure will work as a prioritarian measure as well, and vice versa; (2) two necessary and sufficient conditions for egalitarian and prioritarian measures, respectively, are equivalent; (3) two standard measures for egalitarianism and prioritarianism have been or might be used for either theory; (4) the fact that a measure satisfies Pareto cannot disqualify it as egalitarian; (5) the fact that a measure is level sensitive cannot disqualify it as egalitarian either; and (6) the fact that a measure is non-relational and separable precludes using it for egalitarianism only if a social welfare measure must reflect intrinsic dependence relations in its very form, which is doubtful.

The equivalence of egalitarianism and prioritarianism implies that for practical purposes there is no reason to choose between the two theories. It also implies that for theoretical purposes a choice between the two theories cannot be guided by differences in evaluation.<sup>55</sup>

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## APPENDIX

*Egalitarian Condition:* For a measure of social welfare  $W$  and for all possible populations  $A$  and  $B$  and their members  $p_i \in A$  and  $q_i \in B$ , such that  $|A| = |B|$  and  $\sum w(p_i) = \sum w(q_i)$ , if there is a bijection from  $A$  to  $B$ , such that each individual  $p_i \in A$  could be paired with an individual  $q_i \in B$  so that for each pair of individuals  $(p_i, q_i)$  it is the case that  $w(p_i) = w(q_i)$ , except for four individuals:  $p_1, p_2, q_1, q_2$ , such that  $|w(p_1) - w(p_2)| < |w(q_1) - w(q_2)|$ , then  $A$  does better than  $B$ , and thus  $W(A) > W(B)$ .

*Prioritarian Condition:* For a measure of social welfare  $W$  and for any possible population  $C$  and for any individuals  $r_i, s_i \in C$  such that  $w(r_i) < w(s_i)$  and  $w(r_i) \geq 0$  and  $w(s_i) \geq 0$ , if it is possible to either increase the welfare of  $r_i$  by  $m$ , resulting in population  $C^*$ , or increase the welfare of  $s_i$  by  $m$ , resulting in population  $C^{**}$ , then  $C^*$  does better than  $C^{**}$  and thus  $W(C^*) > W(C^{**})$ .

#### A1. Proof that the Prioritarian Condition Follows from the Egalitarian Condition

According to the assumptions in the Egalitarian Condition, if there are populations  $A$  and  $B$  such that  $|A| = |B|$  and for their members  $p_i \in A$  and  $q_i \in B$ , it is the case that  $\sum w(p_i) = \sum w(q_i)$  and there is a bijection from  $A$  to  $B$ , such that each individual  $p_i \in A$  could be paired with an individual  $q_i \in B$  so that for each pair of individuals  $(p_i, q_i)$  it is the case that  $w(p_i) = w(q_i)$ , except for four individuals:  $p_1, p_2, q_1, q_2$ , such that  $|w(p_1) - w(p_2)| < |w(q_1) - w(q_2)|$ , then it is the case that  $W(A) > W(B)$ .

Let us assume that there is some population  $C$ , which can be transformed into either  $C^*$  or  $C^{**}$  by raising either the welfare of a worse-faring individual  $r_i \in C$  by  $m$  or a better-faring individual  $s_i \in C$  by the same amount  $m$ . We must then prove that if the Egalitarian Condition holds, then  $W(C^*) > W(C^{**})$ .

Let us put  $C^* = A$  and  $C^{**} = B$ , since  $|C^*| = |C^{**}|$  and for their members  $p_i \in C^*$  and  $q_i \in C^{**}$  it is the case that  $\sum w(p_i) = \sum w(q_i)$  and there is a bijection from  $C^*$  to  $C^{**}$ , such that each individual  $p_i \in C^*$  could be paired with the same or a counterpart individual  $q_i \in C^{**}$  so that for each pair of individuals  $(p_i, q_i)$  it is the case that  $w(p_i) = w(q_i)$ , except for the two individuals  $p_1$  and  $p_2$  and their counterparts  $q_1$  and  $q_2$ , where  $w(p_1) = w(r_i) + m$ ,  $w(p_2) = w(s_i)$ ,  $w(q_1) = w(r_i)$ , and  $w(q_2) = w(s_i) + m$ . For these four individuals it is the case that:

$$|w(p_2) - w(p_1)| = |w(s_i) - w(r_i) - m| \dots (I)$$

and the case that:

$$|w(q_2) - w(q_1)| = |w(s_i) - w(r_i) + m| \dots \text{(II)}$$

We can now apply the elementary inequality:

$$\text{If } a > 0 \text{ and } b > 0, \text{ then } |a - b| < |a + b| = a + b \dots \text{(III)}$$

We let  $a = w(s_i) - w(r_i)$  and  $b = m$ . Since (I), (II) and (III) hold, this gives:  $|w(p_2) - w(p_1)| = |w(s_i) - w(r_i) - m| = |a - b| < |a + b| = |w(s_i) - w(r_i) + m| = |w(q_2) - w(q_1)|$ . Thus:  $|w(p_2) - w(p_1)| < |w(q_2) - w(q_1)|$ , and if the Egalitarian Condition holds, then  $W(A) > W(B)$ , which is the same as  $W(C^*) > W(C^{**})$ .

Q. E. D.

*A2. Proof that the Egalitarian Condition Follows from the Prioritarian Condition*

According to the assumptions in the Prioritarian Condition, if there is some population  $C$ , which can be transformed into either  $C^*$  or  $C^{**}$  by raising either the welfare of a worse-faring individual  $r_i \in C$  by  $m$  or a better-faring individual  $s_i \in C$  by the same amount  $m$ , then  $W(C^*) > W(C^{**})$ .

Let us assume that there are populations  $A$  and  $B$ , such that  $|A| = |B|$  and for their members  $p_i \in A$  and  $q_i \in B$ , it is the case that  $\Sigma w(p_i) = \Sigma w(q_i)$  and there is a bijection from  $A$  to  $B$ , such that each individual  $p_i \in A$  could be paired with an individual  $q_i \in B$  so that for each pair of individuals  $(p_i, q_i)$  it is the case that  $w(p_i) = w(q_i)$ , except for four individuals:  $p_1, p_2, q_1, q_2$ , such that  $|w(p_1) - w(p_2)| < |w(q_1) - w(q_2)|$ . We must then prove that if the Prioritarian Condition holds, then  $W(A) > W(B)$ .

Without loss of generality, we can assume that  $w(q_1) < w(p_1) \leq w(p_2) < w(q_2)$ . Consider then a population  $C$ , where  $|C| = |A| = |B|$  and members  $r_i$ , such that  $w(r_1) = w(q_1)$  and  $w(r_2) = w(p_2)$  and for all other  $i$ ,  $w(r_i) = w(s_i) = w(p_i) = w(q_i)$ . Since  $w(q_1) + w(q_2) = w(p_1) + w(p_2)$ , we get  $w(q_2) - w(p_2) = w(p_1) - w(q_1)$ , which gives:

$$w(q_2) - w(r_2) = w(p_1) - w(r_1) \dots \text{(I)}$$

We get  $A$  from  $C$  by increasing  $w(r_1)$  to:

$$w(p_1) = w(r_1) + w(p_1) - w(r_1) \dots \text{(II)}$$

We also get  $B$  from  $C$  by increasing  $w(r_2) = w(p_2)$  to:

$$w(q_2) = w(r_2) + w(q_2) - w(r_2) \dots \text{(III)}$$

Since  $w(r_1) < w(r_2)$  and  $(w(p_1) - w(r_1)) = (w(q_2) - w(r_2))$  and (II) and (III) hold, and if the Prioritarian Condition holds, then  $W(A) > W(B)$ .

Q. E. D.

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