# What are opportunities and why should they be equal?

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**Abstract.** In order to clarify the concept of equal opportunities we need an accurate definition of "opportunity". Opportunities can be defined in terms of qualifying actions through which an agent can achieve an advantageous position. It is concluded that "equal opportunities" is often used as a catchword in cases when opportunities are not really equal, and no one tries seriously to make them so. In many of these cases it would have been more accurate to speak of "open opportunities and procedural justice". These are important enough aspects of social justice, that should be appreciated for what they are, rather than being falsely represented as *equal* opportunities.

## **1** Introduction

Political and social equality refers to the distribution of some commodity or other entity, that we may call the *distribuendum*, among a group of people, the *distributees*. The distribuendum must be assignable to individual members of the group. It may be either uniformly value-positive or uniformly value-negative, i.e. it may either be considered to be an advantage to all distributees (e.g. money or social status) or to be a disadvantage to all of them (e.g., taxes or military service) [8].

Equal opportunity is a variant of equality, in which the distributendum has the form of an opportunity. We can express it as "opportunity to Y", where Ycan be wealth, social status, education, etc. In this case, the distributendum ("opportunity to Y") is assumed to be an advantage to all distributees. (From this it does not necessarily follow that Y itself is taken to be an advantage to all distributees.) Equal opportunity is often contrasted with more direct equality ("equality of outcomes"). We can express this as the difference between an equal distribution of "opportunity to Y" and an equal distribution of "Y" itself. [14, p. 64]

The social and political importance of equal opportunity derives largely from the intuition that "our judgements concerning the degree of inequity inherent in a given distribution depend on the extent to which we see that distribution as the outcome of individual choice." [10, p. 87] As was noted for instance by Nagel, these concerns are shared by egalitarians: "Two persons born into a situation which gave them equal life chances can end up leading lives of very different quality as a result of their own free choices, and that should not be objectionable to the egalitarian." [11, p. 71] However, as we shall see, the relationship between equal opportunities and individual choice is far from unproblematic.

Equal opportunities have been much referred to in recent discussions of equity and social choice. [1; 4; 16; 18; 19] Parts of this discussion would have gained from a more precise analysis of what an opportunity is and what it means for opportunities to be equal. The purpose of this paper is to contribute to the clarification of these issues. Sections 2–3 provide an analysis of the concept of an opportunity. The notion of equal opportunity is defined in Sect. 4, and this definition is applied in Sect. 5 in a discussion of what valid motives can be given for equal opportunities.

#### 2 Openness and control

In the everyday sense of the word "certain", I am certain to receive payment to my bank account for this month's work. It would seem unnatural to say that I have an opportunity to receive my salary. We only talk about opportunities when the outcome is in some sense open.

This openness needs to be further specified. There are several ways in which a future possibility may be open. To begin with, it can depend on factors beyond human control. This has led some authors to construe (a version of) equal opportunity as equal probability. Douglas Rae advanced this interpretation under the name of "prospect-regarding equal opportunity". Formally, he defined it as follows: "Two persons, j and k, have equal opportunities for X if each has the same probability of attaining X." [14, p. 65]

Rae put forward two types of examples of "prospect-regarding equal opportunity": common lotteries and the draft lotteries employed in the Civil War and the Vietnam War. [14, p. 66] The latter type of example does not seem to correspond to any reasonable view of what is meant by an opportunity. If participation in these wars had been seen as an opportunity, then volunteers would have filled the battalions and no draft lottery had been needed. The first type of example is also questionable. If I own a ticket in the National Lottery, then I have a chance to become rich, but not an opportunity in the sense in which this word is used by proponents of equal opportunity. Equal opportunity to wealth cannot be achieved by distributing a lottery ticket to each citizen.

A similar point was made by Brian Barry when commenting on the hypothetical "baby lottery" that was introduced into the discussion by James Fishkin. This is a system in which babies are redistributed at random to families immediately after birth. [3, pp. 57–58] Barry remarked that although the baby lottery would equalize life chances, it would not give rise to what we normally call equal opportunities. Suppose, he says, that random switching of babies has been performed secretly in a country with a strictly implemented caste system. If this is revealed to the public, we can hardly expect proponents of equal opportunity to give up their cause. [2, pp. 31–33]

We can conclude that the openness required for "equal opportunity to Y" is not constituted by "equal probability of Y". Although equal probability may hold in some cases of equal opportunity, it is not the defining characteristic.<sup>1</sup> Opportunity – equal or unequal – must involve some type of human control or human choice.

Furthermore, this control must be exercised by the person to whom the opportunity is attributed. That one person controls whether or not another person will receive an advantage does not give rise to an opportunity for the latter. The Governor of Texas can, at his discretion, reprieve any prisoner in the death row of Texan prisons. It does not follow that these prisoners have an opportunity to be reprieved.

#### 3 What is an opportunity?

We can now proceed to define the concept of an opportunity in a semi-formal manner. We have just seen that in order for a person i to have an opportunity to a potential advantage Y, that person must have some means to choose or control whether or not she will receive Y. In other words, there must be some action such that if i performs it, then Y will be realized. We can write this as follows:

OPP-1 *i* has opportunity-to-*Y* if and only if:

There is some action *X* by *i* such that: If *i* performs *X*, then *i* achieves *Y*.

Here, *i* is a person, *X* is a qualifying action, and *Y* is the potential advantage to which the opportunity refers. At least in typical cases, there will be a class or type of actions, rather than just a single action, that can serve as the qualifying action X in OPP-1. For instance, "performing satisfactorily on the admissions test" is a class of actions, since there are many ways in which one can satisfy the test requirements. For the sake of simplicity, however, I will often use "action" instead of more precise phrases such as "action type" or "class of actions".

<sup>&</sup>lt;sup>1</sup> There are also cases of equal opportunity in which probabilities are not equal. Suppose that free concerts are given in our neighbourhood. Then two persons may have equal opportunity to come and listen although one of them likes the music and the other does not, so that the probabilities that they will attend are very different.

As it stands, OPP-1 is defective. To begin with, it incorrectly subsumes certainty-that-Y under opportunity-to-Y. In Sweden every mother automatically receives a child allowance. Therefore, given that she is the mother of a minor, it holds for each and every action that if she performs it, then she will receive a child allowance. According to OPP-1, she has an opportunity to receive the allowance. This is misleading, and the definition must be modified accordingly:

OPP-2 *i* has opportunity-to-*Y* if and only if:

There is some action X by i such that: If i performs X, then i achieves Y. Otherwise, i does not necessarily achieve Y.

Even after this adjustment, the "if... then" of OPP-2 is in need of clarification and specification. As it stands, the most straight-forward interpretation would be to treat it as material (truth-functional) implication. This would lead to absurd consequences of a type that is known in philosophical logic as the paradoxes of material implication. In particular, whenever "*i* performs X" is false, "If *i* performs X, then *i* achieves Y" is true. Hence, if satisfactory performance on the admissions test is the qualifying action (X) for being admitted (Y), then a person who was not allowed to do the test would be said, according to OPP-2, to have the opportunity to be admitted. This is of course contrary to common intuition. In order to avoid such unwanted conclusions, the connection between the performance of X and the achievement of Y should not be allowed to be merely incidental, but has to be based on some reliable mechanism:

OPP-3 *i* has opportunity-to-*Y* if and only if:

There is a reliable mechanism such that for some action X by i: If i performs X, then through this mechanism i achieves Y. Otherwise, i does not necessarily achieve Y.

The following example shows that we are not yet through: A king has decided to raise every subject to the nobility who, in the first year of his reign, publishes a poem in his honour. This decision is kept secret until the end of the year, when the panegyrists are all made barons. It would be wrong to say that every poet had an opportunity to become a nobleman, although the mechanism was reliable enough. The reason for this is of course that the mechanism, being unknown to the subjects, could not be used by them. More generally speaking, the reliable mechanism referred to in OPP-3 must be known by the agent so that she can use it to her advantage:

OPP-4 *i* has opportunity-to-*Y* if and only if:

There is a reliable mechanism such that for some action X by i: If i performs X, then through this mechanism i achieves Y. Otherwise, i does not necessarily achieve Y. Furthermore, i knows that this is the case.

A further clarification is necessary with respect to the qualifying action (X). Suppose that a king decides to release a certain prisoner if he holds his breath for ten minutes. It would be inadequate, perhaps even cruel, to claim that the prisoner has an opportunity to be set free. A rule that can never contribute to making *Y* happen cannot be said to constitute an opportunity to *Y*. It should therefore be required that the agent be capable of performing the qualifying action:

OPP-5 *i* has opportunity-to-*Y* if and only if:

There is a reliable mechanism such that for some action-type X that i can perform: If i performs X, then through this mechanism i achieves Y. Otherwise, i does not necessarily achieve Y. Furthermore, i knows that this is the case.

OPP-5 will be used as our official definition of opportunity. It is not perfectly precise, but its imprecision corresponds, at least roughly, to the imprecision of the informal concept of opportunity.<sup>2</sup>

In particular, the word "can" in "some action X that i can perform" is open to different interpretations. There are at least two major issues involved in its interpretative variability. First, it is not well-determined how much effort and how big sacrifices one may require of an agent before it is wrong to say that she "can" perform the action in question. A person with a severe allergy to horses has the option of riding a horse, but only at the danger of contracting a serious medical condition. Should we say that the allergic person "can" ride a horse, in the sense required for opportunity?

Secondly, "can" is both vague and context-dependent with respect to what chances of success it requires. In one sense of the word, if I buy a ticket in the National Lottery, than I "can" win the first prize. ("It *can* happen.") In another sense of the word, I "cannot" hit the bull's-eye from a large distance – although the chances of success may be much larger than in the lottery. Both of these senses of "can" appear in discussions of social opportunities.

In order to explicate the meaning of "equal opportunity" we do not need to draw a sharper line between "can" and "cannot" than in non-regimented language. To the contrary, the variations in meaning of "can" are useful to clarify those of "equal opportunity". For that purpose it will be useful to distinguish between degrees of ability. A person who can perform a certain action with little effort, no sacrifice, and certainty of success may be said to have more ability to perform it than one whose performance of it is associated with much effort, sacrifice, or uncertainty of success.<sup>3</sup> In the limiting case when the qualifying action X referred to in OPP-5 requires only negligible

 $<sup>^2</sup>$  A formal definition of an informal concept should clarify as precisely as possible what is meant by that concept, but it is mostly advisable to stop short of drastic reinterpretations of the concept that improve its precision at the price of giving up its connections with the original informal concept that motivated the analysis. [7]

<sup>&</sup>lt;sup>3</sup> There may be cases when these criteria point in different directions, so that e.g., effort and uncertainty of success have to be weighed against each other.

effort and sacrifice, and leads with certainty to *Y*, the agent's opportunity to *Y* may also be called a *free choice* of *Y*.

The qualifying action X referred to in OPP-5 may be defined either in absolute terms or in relation to the achievements of other persons. The latter variant is characteristic of competitive situations. Typical examples are the opportunity to win a scholarship if one is among the ten best participants in a test, and the opportunity to become a concertmaster if one wins an audition. In these and similar cases, the more precise requirement that one has to satisfy in order to obtain the potential advantage depends on the performance of other competitors (cf [20]).

It is sometimes useful to refer to the qualifying action more directly than in the definiendum of OPP-5. The definition can then be rewritten as follows:

OPP-5\* *i* has opportunity-to-*Y* via *X* if and only if:

(i) X is an action-type that i can perform (in the chosen sense of 'can'),

(ii) there is a reliable mechanism such that: If i performs X, then through this mechanism i achieves Y,

(iii) if i does not perform X, then, i does not necessarily achieve Y, and

(iv) *i* knows that (i)–(iii) hold.

Furthermore, i has opportunity-to-Y if and only if there is some X such that i has opportunity-to-Y via X.

In the formal analysis of human choice, the notion of an opportunity set or choice set has turned out to be useful. [12; 13; 17; 19] An opportunity set can be defined as consisting of (representations of) the complete alternatives that are available to an agent in some situation. Definition OPP-5\* indicates how availability can be specified for the purpose of constructing opportunity sets. Many accounts of opportunity sets seem to presuppose a notion of opportunity that corresponds to a strict sense of "can", and hence to the free choice variant of opportunity (which is not the variant of opportunity most often referred to in political and social philosophy).

## 4 Defining equal opportunity

Armed with this definition of opportunity we can now turn to the task of defining *equal* opportunity. A first, quite natural attempt is the following:

EQ-1 *i* and *j* have equal opportunities to *Y* if and only if: there is some *X* such that both *i* and *j* have opportunity to *Y* via *X*.

Unfortunately, this simple definition tends to fail when there is more than one qualifying action for one and the same potential advantage. Suppose, for instance, that there are two rules for admissions to a certain university. First, everyone can qualify by successfully completing an admissions test. Secondly, children of faculty and donors can be admitted if they apply directly to the

vice-chancellor who can admit them at his discretion. Then arguably EQ-1 is satisfied (with X = success in the admissions test), but since some applicants have more opportunities than others it would be wrong to call this a system of equal opportunities. The definition can be amended as follows:

EQ-2 *i* has at least as much opportunity to *Y* as *j* if and only if: it holds for each action-type *X* that if *j* has an opportunity to *Y* via *X*, then *i* has an opportunity to *Y* via *X*. *i* and *j* have equal opportunities to *Y* if and only if *i* has at least as much opportunity to *Y* as *j*, and *j* has at least as much opportunity to *Y* as *i*.

Definition EQ-2 is an improvement, but it still has a problematic feature, related to possible differences in the abilities of the respective agents to perform the qualifying action. Suppose that I am going to visit London next Christmas, and wish to get hold of a ticket to an unusually popular concert on Boxing Day. This concert will be sold out far in advance, and the only way to be sure of obtaining a ticket is to queue, in person, in front of the ticket office on the morning of October 15, when the tickets are released. Then although both I and a Londoner have an opportunity to obtain a ticket, my opportunity is smaller (more restricted) since more effort and sacrifice, namely an extra trip to London, is required of me. On the basis of this and similar examples it may be tempting to require equal ability to perform the qualifying action, as a condition for equal opportunity, and hence to rewrite EQ-2 as follows:

EQ-3 i has at least as much opportunity to Y as j if and only if:

it holds for each action-type X that if j has an opportunity to Y via X, then (1) i has an opportunity to Y via X, and (2) i has at least as much ability as j to perform X.

*i* and *j* have equal opportunities to *Y* if and only if *i* has at least as much opportunity to *Y* as *j*, and *j* has at least as much opportunity to *Y* as *i*.

This, however, is going too far. Consider the case of two equally gifted students. One of them studied hard the last few years, whereas the other has been busy doing something else. The more hard-working student has much higher ability to succeed in a university admissions test than the other. According to EQ-3, they do not have equal opportunities to higher education. This, however, is contestable. It can be maintained that they do indeed have equal opportunities, since the less studious person can be held responsible for her inferior ability. A sufficiently general definition of equal opportunity should allow us to make this type of distinction. In other words, it should be possible to hold agents responsible for certain differences in their abilities to perform qualifying actions, and to disregard these differences in the condition for equal opportunity:

EQ-4 *i* has at least as much opportunity to *Y* as *j* if and only if: it holds for each action-type *X* that if *j* has an opportunity to *Y* via *X*, then (1) *i* has an opportunity to *Y* via *X*, and (2) if *i* has less ability than j to perform X, then this difference is due to factors for which i should be held responsible.

*i* and *j* have equal opportunities to *Y* if and only if *i* has at least as much opportunity to *Y* as *i*, and *j* has at least as much opportunity to *Y* as *i*.

EQ-4 is a reasonably accurate definition of equal opportunity. It contains, of course, a conspicuously vague component, namely "should be held responsible". This phrase can to some degree be clarified by specifying the type of responsibility that is referred to. In an excellent synthesis of recent typologies, Christopher Lake distinguishes between four types of responsibility: causal responsibility (one is responsible for that which one causes), role responsibility (the obligations that one has in virtue of some role or social position that one occupies), capacity responsibility (that one has for actions over which one has full control as an agent) and liability responsibility (that one has if one is eligible for certain kinds of appraisal or treatment), [9, pp. 23–25] It is clearly the last-mentioned form of responsibility that is relevant here.<sup>4</sup> As was also indicated by Lake, the delineation of responsibilities that is relevant for social opportunities is specifically political in nature, and may differ from how we ascribe responsibilities in other contexts. [9, p. 51; 15, pp. 5 and 98]

The vagueness in EQ-4 in terms of the responsibility concept should not be completely removed, however, since it in part reflects the range of interpretations inherent in the non-regimented notion of equal opportunity. Major differences in opinion about equal opportunity can be expressed in terms of the responsibility factor. Consider two high school students, one of whom has well-to-do parents who strongly support her studies whereas the other has deplorable home conditions and receives no help or encouragement from her parents. The second child has to work much harder in order to achieve the same results in school. Presumably, nobody would hold her responsible for her family background, but should she be held responsible for working harder than others in order to compensate for her background? This seems to be the crux of the matter; only if we answer this question in the affirmative can we claim that her opportunities are equal to those of the more fortunate pupils.

#### 5 Distribution according to qualifying actions

We can now turn to the title's second question, and investigate what motivations can be given for equal opportunity. Distributions that aim at equal opportunity constitute a special case of a more general category, namely

<sup>&</sup>lt;sup>4</sup> Fleurbaey's concept of responsibility by delegation is also of interest here. [5] By this he means the responsibility that is assigned to an agent "when the rest of society decides not to spend any resource on the outcome obtained by the individual" for some particular variable. Responsibility of delegation can be conferred to an individual irrespective of the degree of control that (s)he has over that variable.

*distributions according to qualifying actions.* This is a wide category that includes many types of distributions: Wages can be distributed according to the amount of job performed, scholarships according to scholarly achievements, honorary doctorates according to the size of donations, etc. Not all of these can be categorized as examples of equal opportunities.

There seem to be four major types of motives for distributing a potential advantage according to the distributees' performance of qualifying actions. First, the qualifying action can be used as a signal or measure of their preferences for the potential advantage. Secondly, it can be used to measure their worthiness or deservingness to achieve it, and thirdly to measure their functionality or usefulness as possessors of it. Fourthly and finally, if the qualifying action is itself deemed valuable, then it can be used as a criterion for distribution in order to stimulate the distributees to perform it.

In order to identify the motives that can be given for equal opportunity, we are going to study each of these four categories and see to what extent they motivate equal opportunities.

*Preference.* Qualifying actions can be used to signal whether or not one wants to be in possession of a potential advantage. This is typical of free choice situations, in which the qualifying action can be performed with ease and without sacrifice. A simple example is an optional field trip which biology students can take part in if they sign up for it a week in advance.

Qualifying actions can also be used to measure degrees of preference. Queuing for concert tickets is a good example. Since the effort and sacrifice required to obtain a ticket is believed to be (roughly) the same for everyone, queue time can be used as a measure of preference. (As we saw above, this only holds for persons who do not have to travel far to the place where they have to show up for queuing.)

Preferences are states of mind, and it is reasonable to assume that they can correlate fairly well with certain other states of mind, such as willingness to make a certain amount of effort. In contrast, there is no reason to believe that physical capabilities are similarly correlated with preferences. Therefore, a running competition cannot be used instead of overnight queuing as an approximate indicator of preferences. Generally speaking, a qualifying action can be used as a measure of preference only if the effort and sacrifice required to perform it is approximately the same for all concerned individuals.

*Deservingness.* Qualifying actions are standardly used as criteria in the distribution of awards and prizes. Strict principles of procedural justice have an important role here. We expect open entry, and equal treatment of persons who try to perform the qualifying action. It is important, however, to distinguish this form of procedural justice from equal opportunity, with which it may often be incompatible.

The Nobel prize in physics is an extreme but illustrative example. It is given to persons who have made outstanding contributions to physical science. We expect the Nobel committee to satisfy high standards of impartiality when judging scientific contributions. However, in the choice between scientist A who made outstanding contributions and scientist B who made somewhat less outstanding contributions but under conditions in her personal life that made them much more difficult to achieve we expect them to select A rather than B. If the committee followed the tenet of equal opportunity, it would have given the prize to B. Therefore, although a clear case of distribution according to qualifying actions, this is not a case of equal opportunity.

On the other hand, there are cases when desert is judged according to efforts and sacrifices. In Sweden, there is a medal awarded to people who save others' lives at the risk of their own. This medal, I am sure, would be given to a handicapped person who, in order to save someone else, took actions that were dangerous to herself but would not have been dangerous to most other people. A school may have awards for pupils who significantly improve their results, irrespective of the level of achievement on which they started (although I believe such awards to be unusual). In general, however, it is more difficult to judge someone's efforts and sacrifices than her achievements. Therefore, when qualifying actions are used as a measure of worthiness or deservingness, equality of opportunity will not emerge in most cases.

*Functionality*. In some cases, the potential advantage is a social position in which the distributee's performance will affect other people. Qualifying actions can then be used to judge the functionality or usefulness of potential holders of that position. This is a major function of auditions, admissions tests, and appointments on probation. In these cases, just like those of the previous category, it is considered unfair to give the position to someone who was surpassed by others in her performance of the qualifying action (test, etc.). Again, it is important not to confuse procedural justice with equal opportunities. A crippled violinist who played good enough in an audition for a tutti job would not be offered the position of a concertmaster although her achievement was greater, and required much more effort and sacrifice than that of the person selected for that position.

*Usefulness of qualifying action.* Finally, the qualifying action may be used as a criterion of distribution in order to stimulate performance of it. This is how wages and other economics rewards are normally used. This principle of distribution has much to speak for it in terms of social efficiency. However, such requirements of efficiency typically lead to distributions that are distinctly different from those that aim at equal opportunity. Hence, the same payment is given for the same job, irrespective of one's ability to perform it. In principle, this need not be so. If we consider each person's performance of the qualifying action to be equally important, then this may lead us to choose a distribution pattern that gives rise to equal opportunities. However, it does not seem easy to find socially important examples of distribution patterns of that nature.

### **6** Conclusion

Discussions of equal opportunity have often been hampered by insufficient attention to the notion of opportunity itself. In Sect. 3, a fairly precise definition of opportunity was introduced, that was used in Sect. 4 to develop a definition of equal opportunity that can hopefully be helpful in connecting the treatment of equal opportunities in economics and social choice closer to its treatment in political philosophy.

Section 5 was devoted to an investigation of what motivations can be given for equal opportunities. Since distribution according to equal opportunities is a special case of distribution according to qualifying actions, the method chosen was to investigate each of the four major motivations for distributing social advantages according to qualifying actions. It was found that only one of these four motivations, namely the correlation in certain cases between preferences and willingness to perform qualifying actions, provides us with a clear motive in practical cases for distribution according to the principle of equal opportunities. In the other three cases, there are motives for *open* opportunities (free entry) and for procedural justice, but not in general for *equal* opportunities. "Equal opportunities" is often used unreflectingly as a catchword in cases when opportunities are nor really equal, and no one even tries seriously to make them equal.<sup>5</sup>

Open opportunities and procedural justice are important enough aspects of social justice, and they are often far from easily achieved. They should be appreciated for what they are, rather than being falsely represented as *equal* opportunities.

### References

- Arneson RJ (1999) Equality of opportunity for welfare defended and recanted. J Polit Philos 7: 488–497
- [2] Barry B (1988) Equal opportunity and moral arbitrariness. In: Bowie NE (ed) Equal opportunity. Westview Press, Boulder, pp 23–44
- [3] Fishkin JS (1983) Justice, equal opportunity, and the family. Yale University Press, New Haven
- [4] Fleurbaey M (1995) Equal opportunity or equal social outcome. Econ Philos 11: 25–55
- [5] Fleurbaey M (1995) Equality and responsibility. Eur Econ Rev 39: 683-689
- [6] Flew A (1981) The politics of procrustes. London

<sup>&</sup>lt;sup>5</sup> Anthony Flew is one of the few anti-egalitarians who have realized that equality of opportunities can seldom be achieved without equality of outcomes. According to Flew, "in an open competition for scarce opportunities the only equality... lies in the sameness of the treatment of all competitors and potential competitors. The only opportunities are the opportunities to compete, and, of course, whatever other opportunities are won by the successful but not the unsuccessful competitors. [6, pp. 46–47]

- [7] Hansson SO (2000) Essentially inconsistent concepts. Conceptus 33: 57-66
- [8] Hansson SO (2001) Equity, equality, and egalitarianism. Archiv Rechts Sozialphilos (ARSP) 87: 529–541
- [9] Lake C (2001) Equality and responsibility. Oxford University Press, Oxford
- [10] Le Grand J (1991) Equity and choice. An essay in economics and applied philosophy. Harper Collins Academic, London
- [11] Nagel T (1991) Equality and partiality. Oxford University Press, New York
- [12] Pattanaik PK, Yongsheng X (1990) On ranking opportunity sets in terms of freedom of choice. Rech Econ de Louvain 56: 383–390
- [13] Pattanaik PK, Yongsheng X (1998) On preference and freedom. Theory Decision 44: 173–198
- [14] Rae D (1981) Equalities. Cambridge University Press, Harvard
- [15] Ripstein A (1999) Equality, responsibility, and the law. Cambridge University Press, Cambridge
- [16] Roemer JE (1996) Theories of distributive justice. Harvard University Press, Cambridge
- [17] Sen A (1991) Welfare, preference and freedom. J Econ 50: 15-29
- [18] Sen A (1992) Inequality reexamined. Harvard University Press, Cambridge Mass
- [19] Sugden R (1998) The metric of opportunity. Econ Philos 14: 307–337
- [20] Thomas DAL (1977) Competitive equality of opportunity. Mind 86: 388-404