MEASURING INEQUALITY BY COUNTING ‘COMPLAINTS’: THEORY AND EMPIRICS

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This paper examines how people assess inequality of income distribution and how inequality could be measured. We start from the philosophical analysis of Temkin, who distinguishes nine plausible aspects of inequality. His approach is based on the concept of ‘complaints’ or distances between incomes. We examine the Temkin approach by means of the questionnaire-experimental method pioneered by Amiel and Cowell to find out whether the aspects of equality have any plausibility for student respondents and, if so, whether there are aspects which are more appealing than others. Both the numerical and verbal responses show that a considerable majority of the respondents might be influenced by the intuitions included in the combination of the Weighted Additive Principle and the Average view of complaints. The questionnaire results also shed some empirical light on the acceptance of the Transfer Principle and the attitudes towards the Sequence.

1. INTRODUCTION

Since the seminal contributions of Kolm (1969) and Atkinson (1970) on inequality measurement, the literature in this field has ever been expanding. One major reason for the continuing interest in this topic, apart from the practical relevance for economic policy, is undoubtedly the
complexity of the concept of inequality itself. The economist’s concept of inequality, however, has often been not much more than a small set of core axioms on which most of the income-distribution analysis has been built. Pioneering experimental research by Amiel and Cowell (1999) has shown that the economist’s concept of inequality does not simply coincide with the perceptions ordinary people hold on inequality. The fact that respondents give different answers to the same question may mean that they hold different concepts of inequality or that inequality has various meanings. Inequality apparently is complex and multifaceted.

This complexity should not leave economists in dismay. We want to take the research of Amiel and Cowell one step forward. Since we know that people’s concept of inequality poorly matches the economist’s concept, we are particularly interested to find out how people actually do think about inequality. The main aim of this paper is to shed some light on the various meanings or aspects of inequality that people endorse by means of the questionnaire-experimental method.

To pursue this aim one needs to start from a theoretical, philosophical analysis which explores the various ways in which one might assess an income distribution’s inequality. In other words: What ways of looking at inequality can we logically think of? We opted for the highly elaborated, but among economists poorly known, analysis of Larry Temkin (1986, 1993), which is based on the concept of complaints.

It should be clear from the outset that the goal is to elicit the spontaneous attitudes of untrained people towards inequality. The goal is not to assess whether egalitarian theorists have sound fundamental principles. Evidently, uninformed opinions of (a small and biased proportion of) the population do not have any authority over fundamental principles. However, theorists should keep an eye on ordinary positions since they may reveal challenging approaches, force more careful thinking, hint at as yet unexplained positions, or point at underrated or even neglected arguments. Respondents’ attitudes are important if we think of them as part of some kind of reflective equilibrium.

The next section summarizes the most important features of Temkin’s philosophical approach to inequality. Section 3 sketches the setup and the design of the questionnaire, whereas section 4 presents the main findings of the experiment. Section 5 presents the conclusions of this study.

2. PHILOSOPHICAL BACKGROUND

The Temkin approach to inequality is founded on the concept of individual complaints.¹ Someone has a complaint regarding inequality if his income is lower than the income of someone else through no fault or choice of his

¹ Section 2 basically sums up chapter 2 of Temkin (1993).
own.\(^2\) To say that the worse-off have a complaint is to recognize that the mere existence of involuntary income inequality is bad, unjust or unfair.

### 2.1 The size of individual complaints

For any situation, then, in which some have less than others through no fault or choice of their own, the question arises how one should determine the size of different people’s complaints. Temkin argues that there seem to be three plausible answers. Each answer is determined by the choice of a particular reference level of income with which incomes are compared to establish the size of individual complaints.

On the first view, the reference level would be the average income of the income distribution. All those below the average have a complaint because it seems particularly unfair that in a world of equally deserving people someone has a less than average income – the level one would be at if fate had treated each person equally. On this view, the size of an individual complaint of someone below the average is simply the difference between the average and his income, whereas those above the average have nothing to complain about regarding inequality. Temkin calls this the relative to the average view of complaints (AVE).

One might also plausibly regard an unequal world as a deviation from the situation in which each person is as well off as the best-off person. The size of one’s complaint will then depend on the difference between his income and the income of the richest person. Temkin labels this second view the relative to the best-off person view (BOP).

The third answer accepts that all but the very best-off have a complaint, but contends that the size of someone’s complaint depends on how he fares relative to all of the others who are better off than he – henceforth, the relative to all those better off view of complaints (ATBO). Someone’s complaint is simply the sum of the differences between his income and the incomes of all those who are better off.

Temkin’s notion of inequality allows one to make judgements about whether and to what extent particular individuals have a complaint regarding inequality. But we ultimately want to consider judgements about how overall situations compare regarding inequality. Temkin suggests comparing situations by combining the notion of individual complaints with the principles of equality embraced by egalitarians.

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\(^2\) “Throughout this book I use the expression ‘through no fault of their own’ as shorthand for the expression ‘through no fault or choice of their own’. Thus, ‘fault’ need not mean moral fault. It might include any instance of voluntary choice or responsibility” (Temkin, 1993, pp. 13–14). In this formulation ‘own fault’ is reduced to the concept of voluntariness as it appears in the proposals of Arneson (1989) and Cohen (1989, 1990) as opposed to Dworkin (1981a, 1981b). For the remainder of this paper I assume that none of the income differences is resulting from personal fault or voluntary choice.
2.2 Aggregating individual complaints

One of the principles of equality that has strong appeal is the *maximin principle* of equality (MP). It maintains that egalitarians should especially be concerned with the complaint of the worst-off person. To assess a situation’s overall inequality, the complaint of the poorest should be the only focus. A maximin principle of equality may also include a tie-breaking clause that if the worst-off individuals in two different distributions are equally badly off, then one goes on comparing the complaints of the second worst-off persons, the third worst-off persons, and so on, until the tie is broken. This procedure is known as *lexicographic maximin* or *leximin*.

Another principle that seems relevant is what can be referred to as the *additive principle* of equality (AP). According to this principle a situation’s overall inequality is measured by summing up each of the complaints that its individuals have; the larger the sum, the worse the inequality is.

An additive principle might seem preferable to a maximin principle insofar as it is concerned with the complaints of all those who have a complaint, not just with the complaint of one single person. Yet a maximin principle might seem preferable to an additive principle insofar as it is concerned with the distribution rather than merely the sum total of complaints. This suggests that a principle that combines these two elements would have great appeal.

One such principle is the *weighted additive principle* of equality (WAP). It measures inequality by summing up people’s complaints after first attaching extra weight to them in such a way that the larger someone’s complaint is the more weight is attached to it. What the weights should be based on or how the weighting scheme should look like is not discussed by Temkin. However, this principle gives expression to both the view that we should be especially concerned with the worst-off and the view that we should be concerned with all complaints. It would give us a way of capturing the intuition that a world in which 40 people have complaints of 200 would be worse than a world in which 200 people have complaints of 40 and 5 others have complaints of 205, *ceteris paribus*. This is a plausible intuition, but one that neither the additive principle nor the maximin principle captures.

It should be stressed that neither the maximin, the additive nor the weighted additive principle yields an ordering in itself. The principles provide only a judgement about how good or bad a situation is regarding inequality in combination with one of the three discussed views of complaints. Each principle of equality can now be combined with the relative to the average, the relative to the best-off person, or the relative to all those better off views of complaints, rendering nine plausible positions or, in Temkin’s words, aspects of inequality. For instance, AP+BOP considers the sum of all complaints relative to the best-off person.
position thus allows us to measure the overall inequality of a distribution and to compare the degree of inequality of different distributions. Temkin argues for the plausibility of each aspect presented, not that each aspect is equally plausible. Moreover, many of these positions are fundamentally incompatible, resting as they do on contrary views. One might insist that what the conflict between these aspects illustrates is just how complex and multifaceted the notion of inequality is. Thus far Temkin.

3. EXPERIMENTAL SETTINGS

In this section, we present the set-up of the questionnaire. Temkin (1993, ch. 5) refers to results of a poll taken in 1984, but only ten of the forty who received the poll completed it. Because Temkin does not give a complete report of his questionnaire, we were not able to build an identical setting. We therefore relied on the design used by Amiel and Cowell (1992, 1999) since it is readily available and well thought-out.

The questionnaire, which can be found in Appendix A, starts with some explanation and an introductory story. Part one is a numerical part which consists of fourteen numerical questions to find out in an indirect way how respondents compare situations regarding inequality. Focusing on two diagrams at a time, respondents were asked to indicate whether they consider the situation in diagram A less unequal than the situation in diagram B, consider situation B less unequal than situation A, or are indifferent between the situations. There were, in fact, three different versions of the numerical part, each consisting of 14 questions, some of them appearing in all three versions. Three versions were needed since we wanted to collect answers on 32 different questions without making the questionnaires excessively long. To be comparable with Temkin’s poll, these questions included exactly the same 15 questions Temkin confronted his respondents with. The three versions were distributed randomly among the respondents.

3 Questionnaire A has six questions which compare two diagrams where the second diagram contains at least one person who has more income than in the first diagram (income increase). The next eight questions deal which two diagrams where the second is obtained from the first by a rank-preserving transfer, so as to test the transfer principle (which states that a rank-preserving transfer of money from a rich person to a poorer one is inequality decreasing). Questionnaire B has six questions on income decrease, comparing two diagrams where the second diagram contains at least one person who has less income than in the first diagram; six questions on the so-called increasing Sequence, a series of unbalanced income increases; and two questions on the transfer principle. Questionnaire C starts with the same six questions as questionnaire B, has six questions on the decreasing Sequence, and concludes with two questions on the transfer principle. The last two questions of each questionnaire (on the transfer principle) are the same. Only questionnaire A is given in the appendix.
The adequate choice of the numerical questions was crucial for our main objective. We wanted to test whether respondents think along the lines of one of Temkin’s aspects of inequality when asked to compare two simple income distributions. The questionnaire is designed such that each aspect of inequality describes a unique path of answers to the numerical questions. Let me explain. Recall that we deal with nine aspects of inequality. For any two income distributions, each aspect of inequality yields an answer to the question of how these distributions compare regarding inequality. For instance, question A10 asks the respondent to compare situation A = (9, 8, 7, 4) with situation B = (9, 8, 6, 5). The maximin principle of equality combined with the best-off person view of complaints ranks situation B as strictly less unequal than situation A (see Table 3.1). On the other hand, two aspects (AP+BOP and AP+A VE) rule that the inequality in both situations is the same, that is, a tie (T).

The same can be done for each other question. How each aspect of inequality ranks the two situations with respect to inequality has been calculated for each question and a complete overview of what the aspects of inequality rule is given in Appendix B.

Most of the calculations are straightforward except for the aspects based on the weighted additive principle. First, Temkin seems to be inconsistent, or at least unclear, when it comes to counting the size of complaints according to the average view of complaints. Temkin (1993, pp. 20–3) argues extensively that only those who are worse off than the average have a complaint. However, he applies another procedure to measure AVE complaints in his numerical examples where he allows incomes both above and below the average to count. We believe that, from a philosophical point of view, this ambiguity is of major importance, but we will not deal with it here. For the remainder of this paper we have chosen to include both deviations below and above the average, mainly

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**Table 3.1.**

<table>
<thead>
<tr>
<th>MP</th>
<th>AP</th>
<th>WAP</th>
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<tbody>
<tr>
<td>BOP</td>
<td>AVE</td>
<td>ATBO</td>
</tr>
<tr>
<td>A10</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

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4 “Also, recall that to measure a situation regarding AP & AVE one must decide whether on the relative to the average view of complaints deviations above the average should count as well deviations below the average. I assumed they should in my examples” (Temkin, 1993, fn. 58).

5 Rabinowicz (1999, p. 20–4) also points to this fundamental ambiguity in Temkin’s book. Much in Temkin’s approach, e.g. the BOP and ATBO versions of individual complaints,
because this is what Temkin actually does in his numerical examples and supports in chapter 9 of his book. This particular choice yields the same inequality ordering of income distributions as counting deviations below the average only, except in cases measured by WAP+AVE.

Second, for the aspects based on the weighted additive principle, one had of course to specify the weighting function in order to rank the alternatives. We attach extra weight to larger complaints by requiring that the weighting function be strictly increasing in its argument. The weighting function further has to accord with another of Temkin’s implicit requirements, namely that complaints should be treated symmetrically. Symmetry here means that equal complaints get equal weights. We then checked for all possible weighting functions satisfying these conditions. Since WAP in fact represents a class of inequality measures, some cases are undecided.

Now, the fourteen questions (in each of the three versions) are chosen in such a way that each aspect of inequality describes a unique pattern of judgements on these questions. If someone judges all fourteen cases in the same way as one particular aspect of inequality does, then we are sure that his judgements are in at least some cases different from the judgements of any other aspect of inequality. This enables us to differentiate between the aspects of inequality. That someone who judges all fourteen cases in the same way as an aspect of inequality really thinks along that line is plausible but far from sure. He might have other ideas in mind, although we know that it is not one of the other eight aspects of inequality – then he should have given other answers to some questions. To be sure, we should ask him explicitly.

Therefore we added a second part in which we investigated in a verbal and more direct way how respondents might think about comparing distributions. This verbal part consists of two questions. The first one (question 15) asks the respondents to indicate which view of how to measure the size of individual complaints corresponds most closely to their own view: BOP, AVE, ATBO or none. The second question (question 16) then asks them to indicate the way in which those individual complaints should subsequently be aggregated to obtain the overall inequality. They were provided with a choice between the MP, AP, WAP or none. If they gives the impression that the badness of pairwise inequality is a personal disvalue or harm. The badness of pairwise inequality is said to be a personal disvalue if it is a disvalue for a person, and more precisely for the person who is worse off in a given relationship. But then Temkin’s treatment of AVE-complaints is inappropriate since those above the average are not worse off but do have a complaint according to Temkin’s examples. On the other hand, Temkin emphasizes (1993, ch. 9) that the disvalue of inequality is essentially impersonal, i.e. the badness of pairwise inequality accrues to the relation between two individuals. If the latter is true, then there seems something inappropriate in framing an impersonal conception of the badness of pairwise inequality in terms of personal complaints.
choose a particular aspect of inequality in the verbal part and have judged the cases according to this position, then this is quite a strong suggestion that they really think according to that aspect of inequality. For instance, if, after fourteen choices in line with AP+AVE in the verbal part, our respondent indicates that the way one should think about inequality is AP+AVE, then we have a strong case to defend that we know how this respondent, under the given experimental conditions, thinks about inequality.

Finally, part three asks the respondents to answer some personal questions: age, male/female, subject of study, etc. The questionnaires were filled out anonymously during an economics class by 185 first year Business School students at the Catholic University of Leuven, Belgium.

4. EXPERIMENTAL RESULTS

4.1 Verbal part

The verbal part of the questionnaire directly matches the aspects of inequality Temkin describes. It might give us an answer to the question whether the aspects of inequality have any plausibility for the respondents at all and whether there are one or more aspects which are really more appealing than others.

The results given in Table 4.1 are quite remarkable. Almost 60% of the respondents chose both WAP and AVE as the aspect of inequality that best suits their own attitudes towards inequality. Given the wide range of possible combinations, it is remarkable that one result clearly stands out. Asked to give their view about the size of the inequality an arbitrary person is entitled to complain about (question 15), even 75% of the respondents selected the answer that measures the size of an individual complaint as the (absolute) distance between one’s income and the average income. The choice of the average as reference income is not surprising because students in economics (at least) should immediately see that giving everyone the average income is the only feasible outcome of an egalitarian (re-)distribution. On the other hand, more than 77%
stated that the weighted additive principle is the proper way to aggregate individual complaints in order to obtain a measure of the overall inequality (question 16). Again, this is not totally unexpected since the weighted additive principle takes an intermediate stance between the more extreme positions of the maximin principle and the additive principle.

Support for aspects of inequality other than WAP+AVE was small or even non-existent (AP+ATBO). The only aspects which received considerable support were AP+AVE (8.7%) and WAP+ATBO (8.7%). It should not surprise anyone that both combinations include either WAP or AVE. Looking at questions 15 and 16 separately, the picture is clear: AVE strictly dominated the three other alternatives in question 15 and WAP did the same in question 16. On the other hand, one should acknowledge that some of Temkin’s logical positions clearly did not appeal much to our respondents, BOP (3.2%) and MP (3.2%), for instance. About 10% on question 15 and 9% on question 16 chose answer D (None), which means that they did not find a suitable formulation among the given alternatives. This indicates that the vast majority of the students were satisfied with the specified alternatives.

4.2 Numerical part: Synchronic view

The majority of the respondents considered WAP+AVE as the aspect of inequality that best suited their own attitude towards inequality measurement. But did they also choose the answer to the numerical question along this line of reasoning? Are the outcomes of the numerical part consistent with the results of the verbal part? One can answer this question by considering the results of the numerical questions in a synchronic manner, i.e., examining the answers of one individual at a time. Indeed, each aspect of inequality implies a particular outcome on each of the fourteen numerical questions. The questionnaire is designed such that each aspect of inequality describes a slightly different pattern of answers on the fourteen questions. The question is then: To what extent did respondents choose the answers implied by the aspect of inequality they verbally endorsed?

We first focus on those who supported WAP+AVE verbally. Table 4.2 gives the percentages of students who chose the ranking predicted by WAP+AVE for different percentages of questions. In the absence of a determinate function for how much (extra) weight the larger complaints should be given, there is no simple algorithm for comparing distributions according to WAP+AVE. Our specification of the weighting function yields an unambiguous ordering in 8 of the 14 cases. The other six questions cannot be solved without additional specification of the weighting function. For reasons of comparability we have omitted those questions here.
The results are encouraging. Ten respondents (9.2%) were completely consistent. Almost 90% were consistent in at least two thirds (63%) of the questions which may be considered a very high percentage. We are inclined to believe that these results lend support to the claim that the majority of the respondents have outspoken views about how to measure inequality and apply these ideas reasonably well when asked to measure it.

Could it not be that the answer patterns of the respondents are better described by a pattern implied by an aspect of inequality other than WAP+AVE? Respondents might have been consistent with WAP+AVE but possibly were even more in line with the answers given by another aspect of inequality. This is not the case, as Table 4.3 indicates. 63.3% of those who verbally endorsed WAP+AVE were most in line with its implications as well. Their answers come, in percentage terms, closer to the implications of WAP+AVE than to any other aspect of inequality. Only 10% were inconsistent in that they were, in percentage terms, more compatible with an aspect other than WAP+AVE. For 26.6%, we cannot say: Their answers were equally in line with the implications of WAP+AVE and one or more other aspects. The particular questions asked were not sufficient to differentiate between them.

The objection does not hold for those who have chosen WAP+AVE verbally, but it does apply remarkably well to those who did not choose WAP+AVE in the verbal questions. They almost always scored better in the numerical questions on the pattern of WAP+AVE than on their own

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Table 4.2. WAP+AVE consistency (8 questions).

<table>
<thead>
<tr>
<th>Consistency Level</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% (109/109) consistent in at least 38% of the questions</td>
<td>97%</td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
<tr>
<td>97% (106/109) consistent in at least 50% of the questions</td>
<td>89%</td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
<tr>
<td>89% (97/109) consistent in at least 63% of the questions</td>
<td>61%</td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
<tr>
<td>61% (67/109) consistent in at least 75% of the questions</td>
<td>40%</td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
<tr>
<td>40% (44/109) consistent in at least 88% of the questions</td>
<td>9.2%</td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
<tr>
<td>9.2% (10/109) consistent in 100% of the questions</td>
<td></td>
<td>100% (109/109) consistent in at least 38% of the questions</td>
</tr>
</tbody>
</table>

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6 Table 4.3 has been calculated as follows. For each respondent, I compared his pattern of answers with the pattern of answers given by each of the nine aspects of inequality and calculated the percentage of ‘correct’ answers to each of those nine aspects. I obtained nine percentages for each respondent. If a respondent endorsed WAP+AVE verbally, then there are three possibilities: (i) the respondent scored the highest percentage on the implications of WAP+AVE, in which case we call him consistent; (ii) the respondent scored his highest percentage on more than one aspect, in which case we don’t know whether he is consistent; and (iii) the highest percentage was obtained by an aspect other than WAP+AVE, in which case he is clearly inconsistent. Similar calculations have been performed for those who did not endorsed WAP+AVE (Others) verbally.
pattern. Almost 48% were most in line with the predictions of WAP+AVE although they selected a different aspect of inequality in the verbal part. For 31.6% we are unable to differentiate between different patterns. The consistency of other aspects of inequality was considerably lower, in favor of being in line with WAP+AVE. We cannot be sure that people think in terms of WAP+AVE, but we are at least sure that the answers implied by this aspect of inequality are very attractive and of particular interest.7

However, there are reasons for a cautious interpretation of the results. First of all, we are well aware that there is probably too little differentiation between the questions. Some questions imply the same outcome independent of the chosen aspect of inequality (e.g. A3, A6, A9), which, if that particular outcome is chosen, does not teach us anything about which aspect of inequality the respondent might have in mind. If respondents choose this answer, they are consistent with any of the nine aspects of inequality, making conclusions about consistency pointless. Similarly, the really ‘reasonable’ choices in questions A7-A14 are limited to B or T, again making consistency interpretations awkward. These observations, however, do not impair the fact that each aspect of inequality does prescribe a different pattern of answers, although (for one or two questions only) the difference between some may be minimal. The similarities are mainly created by the fixed set of questions self-imposed by our aim to replicate the Temkin poll. Further research should incorporate questions which differentiate more widely between the implications of the various aspects of inequality.

Secondly, the results greatly depend upon the capacity of questions 15 and 16 to capture the essence of the positions involved on the one hand and to stand for the possible attitudes of the respondents on the other hand. One has to strike the right balance between presenting verbal questions in simple wording with the danger of being imprecise (and

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7 Table 4.3 also reveals that only 27 respondents (10.1*109/100 + 21*76/100) out of the total population of 185 (=14.6%) definitely rejected WAP+AVE because their answers to the numerical questions were more in line with another aspect of inequality.
getting uninformative answers) and being very explicit in the wording with the danger of suggesting too much. Caution is needed.

Finally, the results hint at consistency without being able to prove consistent behavior on the side of the respondents. One could make WAP+AVE more explicit by accepting very specific kinds of weighting, calculating the implied patterns of answers and checking the consistency of the answers. However, the current design of the questionnaire is not able to provide sufficient information about the weighting schemes people might have adopted nor about the consistency of their answers. Inconsistency would always be explainable by a slightly different scheme. Further research, including specifically designed questionnaires, should be directed towards an understanding of the employed weighting schemes. In sum, more research and a cautious interpretation in the meantime are certainly needed.

It may be interesting to have a closer look at the questions on which the respondents were certainly not consistent. An alternative way to deduce valuable information from the empirical results is to consider the results in a diachronic manner, i.e. to look at all the answers to one question at a time. We first deal with the questions involving a Pigou-Dalton transfer, then with the questions on the Sequence.

4.3 Numerical part: Diachronic view

4.3.1 The transfer principle. Our questionnaire includes, in total, eight questions dealing with a Pigou-Dalton transfer. Our results are comparable to earlier results on the transfer principle reported by Amiel and Cowell (1992, 1998, 1999): Empirical agreement with the transfer principle, which was widely considered by theorists as being uncontroversial, is in most cases remarkably low. Depending on the case, they found agreement with the transfer principle to be between 38% and 78%. The highest percentage was reached in the case where a small amount was transferred from the richest to the poorest person. The agreement with the transfer principle in our population (Table 4.4) was, in general, higher than in the Amiel and Cowell study (between 42.7% and 92.4%), although we should recall that the experiments are too different to be directly comparable: Amiel and Cowell compared other income distributions and used a simple vector presentation.

Can we find any pattern in the way respondents answer the questions on the transfer principle? There are at least some interesting features here. The agreement was high when the poorest person was at the receiving end of the transfer. On the other hand, if the richest was the transferor, agreement decreased with the rank of the transferee: The lower his rank, the more respondents agreed that the transfer decreases inequality. Many
considered it particularly offensive if the transfer made the group of the richest larger (A7, 14). Finally, attitudes seemed to be scattered most if neither the poorest nor the richest were involved in the transfer: some thought it increased inequality, others thought it decreased it, while a few believed inequality remained unchanged (A11).

This brings us to another remarkable result. The transfer from the second poorest to the poorest seems to be of special importance. Questions 13 and A10 are very similar in this respect: They represent a transfer of one unit from the second poorest to the poorest person. The results, however, are very different: 92.4% considered the transfer in A10 as inequality reducing, whereas only 63.2% did in 13. The explanation has to be found in the difference between the questions. The transfer in question 13 removes the difference between the poorest and the second poorest completely, whereas the transfer in A10 bridges the gap only partially. It seems that some people were particularly offended by an increase of the group of the poorest or by getting the impression that a group has clearly fallen behind the rest or even been excluded. This might suggest that the number of the poorest or the gap between the poorest and the richer in income may be important in comparing income distributions.

<table>
<thead>
<tr>
<th>Question</th>
<th>A more equal</th>
<th>B more equal</th>
<th>A = B</th>
</tr>
</thead>
<tbody>
<tr>
<td>% (n = 92)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (4, 6, 9, 9)</td>
<td>A7</td>
<td>42.4</td>
<td>50.0</td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (4, 7, 8, 9)</td>
<td>A8</td>
<td>35.9</td>
<td>56.5</td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (5, 6, 8, 9)</td>
<td>A9</td>
<td>1.1</td>
<td>91.3</td>
</tr>
<tr>
<td>A = (4, 7, 8, 9); B = (5, 6, 8, 9)</td>
<td>A10</td>
<td>6.5</td>
<td>92.4</td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (4, 7, 7, 10)</td>
<td>A11</td>
<td>42.4</td>
<td>43.5</td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (6, 6, 6, 10)</td>
<td>A12</td>
<td>22.8</td>
<td>73.9</td>
</tr>
<tr>
<td>% (n = 185)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A = (4, 6, 8, 10); B = (5, 5, 8, 10)</td>
<td>13</td>
<td>29.2</td>
<td>63.2</td>
</tr>
<tr>
<td>A = (2, 5, 5, 6, 7); B = (2, 5, 6, 6, 6)</td>
<td>14</td>
<td>53.0</td>
<td>42.7</td>
</tr>
</tbody>
</table>

Table 4.4. Transfer principle.
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<table>
<thead>
<tr>
<th>% (n = 46)</th>
<th>Question</th>
<th>A more equal</th>
<th>B more equal</th>
<th>A = B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = (1, 1, 1, 1); B = (1, 1, 1, 10)</td>
<td>B7</td>
<td>95.7</td>
<td>4.3</td>
<td>0</td>
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<td>2.2</td>
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<td>41.3</td>
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<td>B11</td>
<td>6.5</td>
<td>26.1</td>
<td>67.4</td>
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Table 4.5. Sequence unbalanced enrichment.

4.3.2 The sequence. Other deviations from consistency occurred in the responses to questions B11 and B12 (Table 4.5) and C11 and C12 (Table 4.6). These questions are part of a series of questions dealing with the so-called Sequence. To understand what is meant by the Sequence, imagine a population of *n* people who are alike in virtually every respect. All have the same income. Now let one individual in the population drop to a lower level of income. All except one enjoy the same high income, but the one exception has a lower income. Now let the remaining *n* − 1 individuals start dropping to this lower income level one by one. Go until all are on the lower income level and no one has been left behind with the original high income level. The question then is: What happens to inequality along this ‘sequence’ of events? What happens to inequality in this story of ‘unbalanced immiserisation’ has been discussed by Temkin (1986, 1993). Amiel and Cowell (1994; 1999, pp. 78–9) examine the reverse story, one of unbalanced enrichment: All start at the same low income level and one by one jump to the higher income level until all are in that position.

The picture for unbalanced enrichment and unbalanced immiserisation is pretty comparable. Any change to a perfect equal distribution induces inequality (B7 and C7). Any income change resulting in a perfect equal distribution reduces inequality (B10 and C10). Almost all respondents shared these insights. Any change of income towards an equal division of the population between low income and high income was considered as equality improving by a majority of respondents (B8, C8) and any income change departing from such an equal division was judged inequality inducing by most (B9, C9). When we take the results of questions 7–10 together and look how the participants judged the inequality along the sequence, the picture is clear. In the model of enrichment, 47.8% said
that inequality first increases, then decreases, increases again and finally decreases (answer pattern ABAB). In the model of immiserisation, even 55.3% assessed the (reversed) sequence of events in the same way. No aspect of inequality allows for this combination except some measures of the WAP+A VE class.

The consistency, however, is less remarkable once we consider questions B11 and C11. Question 11 compares two perfectly equal income distributions where one simply can be obtained by multiplying each individual income of the other by the same scalar. Under all conventional definitions of equality, as well as under all aspects of inequality, these two distributions are perfectly equal. But about 30% did not agree with this view, mostly to provide support for the distribution with the highest total income. They said that an equal distribution was more ‘equal’ than another equal distribution. One explanation which may make this result understandable is to assume that these respondents linked the ideal of equality to other moral ideals such as justice, fairness, sufficiency, or freedom and responsibility. They may believe that higher total income overrides inequality considerations and the richest distribution deserves to be labelled more equal. Efficiency arguments are then a constitutive part of inequality comparisons or even of the concept of inequality itself.

This result, however, might raise serious doubts about the validity of the answers to other questions. One might even suspect that these respondents simply do not understand what the questionnaire or even

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<table>
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<th>A more equal</th>
<th>B more equal</th>
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**Table 4.6.** Sequence unbalanced immiserisation.
equality is all about. We calculated the results excluding these (in total 29) respondents but did not find significantly different results. This is why we kept them in the results tables reported here, which implies that one should draw only qualified and cautious conclusions. Some may now think that Pareto improvements – at least someone gets more without anyone getting less – interfere with inequality comparisons on other occasions as well. This can not be deduced from our results. Take question B7, for instance. Only a few (4.3%) stated that they believe that the unequal distribution was more ‘equal’ than the equal one. They traded-off equality for extra income, even if the income has to go to one only. But the vast majority did not allow that this Pareto improvement interfered with their inequality comparison.

5. CONCLUSIONS

Measuring inequality by counting complaints may eventually seem to be not as extravagant as it may have initially sounded. We have given a glimpse of the philosophical framework Temkin provides for measuring inequality based on the concept of complaints. His two-step procedure generates nine possible positions or aspects of equality, which he argued have great plausibility since they express intuitions which influence our egalitarian judgements, although they are not all equally appealing.

Such a framework was exactly what we needed to pursue the main objective of our research: To acquire some insights in the way respondents measure and compare the inequality of different distributions. By means of the questionnaire-experimental method, mainly focusing on the patterns of answers, we wanted to find out whether there are any aspects of equality that are more appealing to our student respondents than others.

As far as the questionnaire-experimental method is able to capture the attitudes of uninformed people, the results appear to be illuminating. Both the verbal responses and the synchronic reading of the numerical results show that a considerable majority of the respondents might be influenced by the intuitions included in the combination of the weighted additive principle and the relative to the average view of complaints (WAP+AVE). Moreover, most of the students’ judgements in the numerical part did not contradict their responses in the verbal part. A diachronic reading of the numerical results added to the conclusion that the WAP+AVE measures have some appealing features. The WAP+AVE measures proved helpful in explaining the large empirical rejection of the sacrosanct transfer principle that Amiel and Cowell report (and is confirmed by our results). The suggestion of Amiel and Cowell is confirmed that people might think in terms of distances, and we may now even add that distances relative to the average seem to be especially important (although we suggested that the distance between the poorest and the second poorest may be relevant as well in some cases).
Some words of caution, however, are appropriate here. Improvements and further research are certainly required, not in the least repeating the questionnaire study with larger and more representative populations and with a more elaborated choice of numerical questions to differentiate even further between what the various aspects of equality imply. The consistency of those choosing WAP+AVE verbally can only be checked with more explicit weighting schemes and accordingly modified verbal questions. This study is exclusively modelled within the income space, whereas an alternative study in the welfare space may yield quite different results, especially concerning the rejection of the transfer principle.

Empirical results as these – as a constitutive part of some sort of reflective equilibrium – are particularly useful for guiding future research, both theoretical and empirical. Questions about what the weighting scheme should look like or why the income gap between the second poorest and the poorest seems to be so important announce themselves as valuable research projects. Research on how to link the Temkin measures with existing inequality measures is promising as well. To really know more about how people compare income distributions, we should ask them explicitly, for instance, by means of interview techniques. Our limited research might be valuable in this respect as well, since it may provide the direction in which questions should be phrased to acquire insights into people’s egalitarian judgements.

APPENDIX A: THE QUESTIONNAIRE

In this appendix, we give the complete version of questionnaire A. Questionnaires B and C are exactly the same, except for different income distributions A and B, of which some are given in the text (see Tables 4.4–4.6).

INEQUALITY QUESTIONNAIRE

This questionnaire concerns people’s attitude to inequality. We would be interested in your view, based on hypothetical situations. Because it is about attitudes there are no “right” answers. Some of the possible answers correspond to assumptions consciously made by economists: but these assumptions may not be good ones. Your responses will help to shed some light on this, and we would like to thank you for your participation. The questionnaire is anonymous.

Alfaland consists of four persons who are identical in every respect other than the income they earn. Two economic policy proposals A and B are being considered for implementation in Alfaland next year. It is known that – apart from their impact on personal incomes – the two policies would have the same effect on the population. The impact upon the persons’ incomes would depend upon the particular state of the Alfaland economy at the time the policy (A or B) is to be introduced.
In each of questions 1 to 14 two alternative lists of incomes A and B (in Alfaland local currency) are given. Each of these pairs represents the outcomes of the A-policy and the B-policy on incomes of the four persons in each of 14 different situations in which Alfaland might find itself next year. In each case please state which policy you consider would result in lower inequality in Alfaland by circling A or B. If you consider that the two policies will result in the same inequality then circle both A and B.
MEASURING INEQUALITY BY COUNTING ‘COMPLAINTS’

4) A

B

5) A

B

6) A

B

7) A

B
Question 15:

Let us have a closer look at the hypothetical situation of Alfaland. Some economists assume that perfectly identical persons (as in Alfaland) which incomes differ have a complaint regarding inequality. Those economists however do not know exactly how to measure the size of such a complaint. That’s what this question is all about. We offer you some alternative proposals how one might measure the size of complaints. Please circle the letter alongside the view that corresponds most closely to your own. Feel free to add your own proposal or any comment that explains the reason for your choice.
(A) The inequality an arbitrary person in Alfaland is entitled to complain about is the difference between his income and the highest income.
(B) The inequality an arbitrary person in Alfaland is entitled to complain about is the difference between his income and the average income.
(C) The inequality an arbitrary person in Alfaland is entitled to complain about is the sum of the differences between his income and all higher incomes.
(D) None of the above.

Own proposal or comment: . . .

**Question 16:**

Those economists assume furthermore that the overall inequality in Alfaland is determined in some way or another by the size of the individual complaints. We offer you again some alternative proposals. Please circle the letter alongside the view that corresponds most closely to your own. Feel free to add your own proposal or any comment that explains the reason for your choice.

(A) The total inequality in Alfaland is equal to the sum of all the complaints.
(B) The total inequality in Alfaland is equal to the size of the largest complaint.
(C) The total inequality in Alfaland is equal to the weighted sum of all the complaints where the larger complaints are given a higher weight.
(D) None of the above

Own proposal or comment: . . .
Thanks

**APPENDIX B: WHAT THE ASPECTS IMPLY**

The table below indicates which judgement each aspect of inequality implies: ‘A’ means that a particular aspect of inequality ranks distribution A as having less inequality than distribution B; ‘T’ (tie) means that it ranks equality in both distributions to be equal; ‘B(t)’ means that if we apply leximin as tie-breaker when maximin implies a tie, B has less inequality than A; and ‘?’ means that any outcome is possible depending on the weighting structure one imposes. Notice that we calculated WAP+AVE relative to all the deviations from the average, not only those below the average. Tables for question series B and C are available from the author upon request.
### REFERENCES


Rabinowicz, W. 1999. The size of inequality and its badness: Some reflections around Temkin’s *Inequality*. Mimeographed


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