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Moral Intuitions and Economic Models of Distributive Justice

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Abstract. We argue that formal theories of justice cannot neglect the moral intuitions existing in society and illustrate this claim with empirical results. We analyse the perception of justice in a production context by starting from the surplus sharing model. Our questionnaire method is closely related to the work of Yaari and Bar-Hillel [14]. Our results suggest that differences in effort are considered to be the main justification for income differences. Our respondents strongly disagree about the remuneration of innate capabilities. It is further suggested that surplus sharing and cost sharing models cannot be treated symmetrically, because people react differently towards gains and losses.

1. Introduction

In the vast literature on distributive justice one can distinguish two, almost completely disconnected streams. On the one hand there is the philosophical and economic literature, where one tries to find an acceptable interpretation of distributive justice through rational discussion and formal model construction. On the other hand we see an equally impressive amount of work by psychologists and sociologists trying to describe and explain how people think about justice and how they behave when they face an interpersonal distributional conflict. The former literature is more formal and theoretical, the latter rather informal and descriptive. In this paper we will argue that a combination of both approaches might lead to a better understanding of the concept of distributive justice.

The broad lines of this point of view are sketched in Sect. 2. The remainder of the paper is devoted to a presentation of some empirical results on moral intuitions. Both our general ideas and our concrete methodology have been inspired by the

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work of Yaari and Bar-Hillel [14]. In Sect. 3, we present our questionnaire method, which is closely related to theirs: we describe concrete cases and let our subjects choose their preferred distribution.

Yaari and Bar-Hillel [14] concentrate on the pure distribution problem. We tried to approach also the problem of differences in effort, in productivity or in contributions. This obviously is a crucial problem if we want to get an insight into the social discussions on justice. It becomes still more important if we believe the (often confirmed) hypothesis of social psychologists[1] that the choice of value judgements is dependent on the nature of the social relations defining the distribution situation. Deutsch [2] e.g. suggests that productive effort will be the dominant principle in cooperative relations in which economic productivity is a primary goal; when the goal is the fostering of enjoyable social relations, the principle of equality will dominate, while need will be the main principle in cooperative relations that aim at the fostering of personal development and personal welfare. Since economists probably are most interested in the first kind of relations, the neglect of productive effort would be especially harmful.

To keep in touch with the economic literature, we will start from the surplus and cost sharing problems as analyzed e.g. by Moulin [8]. In Sect. 4, we present some results on the relevancy of this model for real life distributional situations. The surplus sharing problem is a pure distribution problem, but also offers a good starting point for the exploratory analysis of justice in a production context, which follows in Sect. 5. Section 6 concludes.

2. Observed Moral Intuitions and Formal Models of Distributive Justice

The psychological approach rightly points to the variation in conceptions of justice over different socio-historical periods, different cultures and different personality-types (Deutsch [3]). People seem to have a strong desire "to believe in a just world" (Lerner [5]), which means that they will often accept and rationalize existing institutions as "just".

Economists sometimes seem to be insufficiently aware of this kind of social influences, not only on the development of socially acceptable conceptions of justice, but also on their own thinking. This does not imply that one should fall into a purely descriptive relativism, possibly leading to the "feeling of intellectual disorganization", which now seems to characterize at least part of the psychological work (Deutsch [3]). More rigorous and formalized thinking can stimulate ethical discussion and, despite all social influences and different positions of power in society, such rational discussion is possible and necessary. However, it does imply (at least in our opinion) that a formalization of justice conceptions cannot start from virgin inspiration arising in a social vacuum, but that it is based necessarily on moral intuitions existing within a given social context[2]. In fact, to be a reasonable

[1] See e.g. Deutsch [2, 3], Lerner [5], Leventhal [6].

[2] It is worth emphasizing that we do not want to defend an intuitional point of view. In fact, we do not want to make any statement at all about the philosophical question of the basic ground for ethical judgments. We only say something about the activity of social scientists and philosophers, trying to probe the concept of justice.

conception of *social* justice it must be consistent with the ethical standards of at least some social groups. It seems difficult therefore to maintain that a formal approach would be very useful, if it departed completely from moral intuitions. This has the positive implication that structured observation of such moral intuitions may yield useful information for the construction of better formal models. To be helpful for this purpose, the empirical work has to start from, or at least be inspired by existing formal models. The lack of such inspiration seems to be one possible explanation for the neglect of the psychological literature by the economics profession[3].

Empirical research on moral intuitions may contribute to the construction of better formal models, both in a negative and in a positive way. The former, mainly destructive, role is well illustrated by the work of Yaari and Bar-Hillel [14]. They convincingly show the insufficiency of the welfarist or bargaining framework, which has dominated the economic literature for a long time. Many authors now have argued on theoretical grounds that these formalizations are too simplified to capture all intricacies of the distribution problem[4]. Empirical work may strengthen the argumentation against some formal theory of distributive justice by showing that its invariance requirements are not consistent with the moral intuitions of the people. Such invariance requirements are defined by Sen [12, p 170] as follows: "If two objects x and y belong to the same isoinformation set I, then they must be treated in the same way $J(\ldots)$. It asserts that any difference between two objects x and y belonging to the same isoinformation set is irrelevant in the current context". They may be "falsified" (a too strong term here) in the following way: take two situations, belonging to the same isoinformation set according to the theory, and show that variation in (supposedly) irrelevant characteristics leads to the use of different distributional rules. This is exactly what is done by Yaari and Bar-Hillel [14] to show the insufficiency of the welfarist framework.

Things become more interesting once we leave the restricted welfarist or bargaining framework and include information on resources, preferences, needs, skills and so on, i.e. look for mechanisms on a domain of "economic environments" (Roemer [10]). Empirical research then may play a constructive role in helping to determine what axioms are acceptable. Axioms defined on such richer domain indeed are no longer purely formal, they tend to become substantial and (possibly) disputable ethical statements[5]. This becomes still more the case if we introduce information about the nature of the goods and about the character of the utility function, i.e. define a domain of "ethical environments". There is a danger that, in including more and more information, one moves from theory to thick description (see Roemer [10]). Part of the problem, however, follows from the ambition of formulating a "general" theory of justice. It could be argued that the idea of consensus itself, operationalized through "generally accepted" axioms, is a questionable point of departure for the exploration of justice in a social context.

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[3] This is strongly suggested by the warm reception of the paper by Yaari and Bar-Hillel [14], who use an empirical psychological method, to investigate a tightly formalized problem.

[4] For recent examples see Sen [12] on welfarism and Roemer [10] on the use of bargaining theories.

[5] In a certain sense one could say that the rejection of the (often implicit but always substantial) restriction of welfarism necessitates, but at the same time makes possible, the introduction of other substantial ethical axioms.

And certainly it may be useful to structure the social discussions on distributive justice by theoretically exploring the consequences of different sets of axioms.

Neither the destructive nor the constructive role of empirical research on moral intuitions should be seen as a "test" of a theory of justice. Moral intuitions, existing in a given society, may be completely inconsistent. Moreover, they themselves are influenced by philosophical and economic discussions and are not independent of the ethical hypotheses to be tested. We rather feel that there should be a kind of dialogue between models of justice and existing moral intuitions. The empirical results could then act as a breeding ground for further theoretical work.

Let us make one final point. Even those who are convinced that observed moral intuitions are totally irrelevant for ethical thinking on distributive justice, must be interested in empirical work on held opinions. Indeed, if they take seriously their personal notion of justice, they will want to realize it, i.e. make the world more just in their own opinion. The social support for these ideas will be crucial to determine their feasibility. Empirical research will give information on the popularity of different notions of justice and about the distribution of this popularity over the different social groups.

3. Method

Given that we want to get information on moral intuitions and ethical opinions, a questionnaire method obviously suggests itself. If we accept that it is useful to think about ethics as a way of how people should (but not always do) behave, actual behaviour is not the adequate source of information, since it will usually be determined by a mixture of ethical and selfish considerations. This immediately does imply of course that people in a real world distributional situation, will not necessarily choose the rule they have chosen when filling in the questionnaire.

When we want to explore the link with theory, an attractive method is the use of simple and concrete cases in which a specific distributional problem is formulated. Subjects are asked to give a judgement on how a certain amount of goods (or income) is to be distributed. They can choose between a number of given distributions which are based on theoretical models or can (if they desire) add their own solution. This method was already used by Yaari and Bar-Hillel [14]. Another basic idea of their approach is the construction of a series of variants with slight modifications of a same basic situation. These variants then are presented to different, comparable groups of respondents. By a systematic manipulation of the information provided in the variants and by comparing the responses to this manipulation, it becomes possible to assess the effect of different conditions or variables.

Our cases are less tightly formalized than those of Yaari and Bar-Hillel [14] and more similar to real-world situations. Of course, this has obvious theoretical disadvantages. However, as our problems look less like algebraic assignments, we perhaps get a better idea about the "moral intuitions" of our respondents.

In May 1986, we presented a first list of cases to 243 first year university students taking an economics course. Twelve sets of questions were constructed (each with eight questions) in such a way that no set contained different variants of the same

case. The sets were distributed among the students randomly. Each student responded to one set of questions and there was no interaction among respondents. Most variants appeared in two or three different sets: in comparing responses between sets, we found that they formed patterns that are remarkably consistent and stable. We therefore consider our data as reliable. Although it is obvious that our results do not come from a representative sample of the population, they seem interesting enough to be analysed on their own. It has to be emphasized, however, that we consider them only as illustrative.

4. Surplus Sharing and Cost Sharing Problems

An interesting starting point for research on moral intuitions in a production context seems to be the surplus sharing problem. This (pure distribution) problem is formulated by Moulin [8] as follows: "A fixed, finite number of agents enter a joint venture, generating a monetary return. Utility is fully transferable by monetary side payments. Knowing the individual opportunity costs and the total returns and assuming there is a surplus, how should we divide it?" He argues that the equal and proportional sharing rules are the two focal solutions of that problem and indeed the only ones satisfying a set of reasonable axioms[6].

This surplus sharing problem is an interesting starting point for at least two reasons. In the first place, it has a strong formal structure and both solutions have a clear game theoretical interpretation (see again Moulin [8]). *Equal* sharing follows when we view the model as a cooperative game, where intermediate coalitions generate no surplus but the grand coalition does. Any symmetric solution concept then divides the surplus equally: since cooperation of *all* agents is necessary to generate the surplus, they all have an equal right to it. *Proportional* sharing follows when we interpret the model as a pricing problem. We then assume that the surplus depends on the opportunity costs of the different agents. If we have no further information on the exact functional relationship, it seems reasonable to use the proportional division rule. The opportunity cost is the only available measure of individual effort and if the surplus is determined by the joint effort of all agents, their reward per unit of effort should be equalized.

In the second place, the two focal solutions of equal and proportional sharing also are the distribution rules proposed by social psychologists[7]. There is by now massive evidence that these rules indeed will be followed by most respondents when they are confronted with a distribution problem. The surplus sharing problem seems to be one of the places where economic and psychological models of distributive justice could meet.

Therefore, survey research can help to find an answer to the most crucial question from an ethical point of view: under what conditions should we prefer an equal division and under what conditions a proportional one? The axioms proposed in the economic literature mostly are rather formal and it seems that the input of more substantial information is needed to answer this basic question. As we

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[6] At least, when the number of agents is at least three. See his Theorem 2.

[7] See e.g. Deutsch [2]. A third rule is the application of the needs principle, which is irrelevant here.

Table 1. "John and Peter are glassblowers and set up a business together.

((a) John works five days a week and Peter only four; (b) John is artistically more gifted than Peter and could therefore earn elsewhere a higher income).

Their work is complementary and they both are absolutely indispensable. John has a net income of 500 000 BF a year and Peter earns 400 000 BF. After a year, they have got a sales revenue of 990 000 BF, so that they after deduction of their wages have realized a profit of 90 000 BF. What would you consider to be a just division of this profit?"

Distribution		% of respondents	
John	Peter	Variant (a)	Variant (b)
90 000	0	0	0
60 000	30 000	2.5	12.2
50 000	40 000	82.5	36.6
45 000	45 000	15.0	51.2
40 000	50 000	0	0
30 000	60 000	0	0
0	90 000	0	0
N		40	41

noted in Sect. 2, the collection of such substantial information may be one of the main purposes of research on actual moral intuitions. Let us illustrate this with some empirical findings.

The case summarized in Table 1 is designed in accordance with the surplus sharing model. It is therefore reassuring to see that for both variants either proportional or equal sharing is chosen by at least 88% of our respondents. It is immediately obvious however that the choice between the two rules considerably differs between the variants and can be manipulated through the description of the concrete situation. Variant (a) is a polar case where the pricing interpretation mentioned earlier dominates, as was expected. In fact, it can hardly be called a pure surplus sharing problem. In variant (b) where the original income difference is clearly interpretable as an opportunity cost difference (following from differences in natural talent) our respondents are divided, half of them choosing the equal division rule and the other half the proportional one.

In the next section, we will start from this surplus sharing model, to investigate the problem of justice in a production context. That section will be an illustration of the constructive role, which can be played by empirical research on moral intuitions. Before turning to this constructive part, however, it is important to emphasize that one should be very cautious in drawing too grand conclusions from these results. Formal similarities between different models are not sufficient to conclude that the perception of justice also will be similar. Let us illustrate the problem with two examplary cases.

The problem of cost sharing is formally similar to that of surplus sharing and they often are treated symmetrically in the economic literature. For our respondents, things are not so straightforward, as is shown in Table 2. The differences are especially striking for variant (a): while 82% of the respondents would choose proportional division for a surplus, only 40% does so for a loss. About half of the respondents divide a loss equally over the two agents: the resulting distribution of

Table 2. Description of the case as in Table 1, but the last two sentences replaced by

"After a year they have got a sales revenue of 810 000 BF, so that they after deduction of their wages, have incurred a loss of 90 000 BF. What is a just division of this loss?"

Distribution		% of respondents	
John	Peter	Variant (a)	Variant (b)
90 000	0	0	2.4
60 000	30 000	0	2.4
50 000	40 000	41.0	51.2
45 000	45 000	48.7	36.6
40 000	50 000	10.3	2.4
30 000	60 000	0	2.4
0	90 000	0	2.4
N		39	41

final incomes (455.000/355.000) is no longer proportional to the number of days worked by the agents (5/4)! This result will not be surprising for those familiar with the psychological literature. The asymmetry between gains and losses in fairness judgments there is a quite general finding. This same idea has also been emphasized by Kahneman et al. [4] in their analysis of the perception of entitlements in the market. In theoretical economic analyses, however, one often ignores this asymmetry.

Our results could be explained immediately, if we accepted either that respondents are not sufficiently rational and consistent or that the symmetric treatment of surpluses and costs is not a necessary condition for consistency. We prefer another interpretation, however. The case described in Table 2 does not present a one-step division problem: as it is formulated, the agents first get an income and only after a year they realize that there is a loss. In a certain sense one can say that they both have acquired rights with respect to their original income level and that these rights are equally valued for both agents. In that case it may be reasonable that they have to sacrifice the same amount of money. A notion of "rights" probably is essential if we want to understand the moral intuitions of our respondents. These seem to be in line with the idea that one should not judge the fairness of a distribution with so-called "end-state" principles only[8].

A second illustration of the need to be cautious when exploiting formal similarities is given by the results in Table 3. In that case three friends use part of an inheritance to buy a sailing boat (variant a) or to pay taxes (variant b). The formal similarity between these two examples of cost sharing is obvious[9]. Respondents, however, react differently to both problems: while the proportional division is largely dominant for the tax variant, half of our respondents feel that the cost of

[8] We use Nozick's [9] terminology, but he goes much further by arguing that end-states do not matter at all.

[9] An application to taxation is given by Young [15]. In fact, Table 3 contains two variants of a broader case which was set up to "test" the estate allocation problem, analysed by Aumann and Maschler [1] and discussed also in Young [15]. In all cases, a very large majority of our respondents chose the proportional division rule. The psychology of taxation is treated more extensively in Lewis [7].

Table 3. "John, Peter and Charles are good friends. When a mutual friend dies, they inherit 1 million, 2 millions and 3 millions BF respectively.

((a) They decide to buy together for the three of them a sailing boat of (1.8 millions/3 millions) BF; (b) Together they have to pay a tax of (1.8 millions/3 millions) BF

What do you consider to be a fair division of this ((a) purchase price, (b) tax)?

Distribution 1.8 million			% of respondents				Distribution 3 million		
			variant	variant	variant	variant			
J.	P.	Ch.	(a)	(b)	(a)	(b)	J.	P.	Ch.
0	0.4	1.4	5	10.5	4.8	0	0	1	2
0	0.6	1.2*	–	5.3	–	4.8	0.25	1	1.75*
0.25	0.6	0.95*	–	5.3					
0.3	0.6	0.9	40	73.7	38.1	90.5	0.5	1	1.5*
					4.8	–	0.5	1.25	1.25*
0.4	0.6	0.8	0	5.3	4.8	0	0.75	1	1.25
0.6	0.6	0.6	55	0	47.6	4.8	1	1	1
	N		20	19	21	21			

* The asterisks denote distributions which have been added by the respondents

buying the boat should be divided equally. This suggests that moral intuitions about taxes and the financing of public goods are much more complex than would be suggested by the formal structure of the cost sharing problem. Empirical research on moral intuitions can be helpful to unravel some of these complexities. Our results may be seen as an illustration of the negative role which empirical observations on moral intuitions may have to play. They indicate that the information given by the cost sharing model is not sufficient. Formal analysis remains indispensable, however. Without it empirical research would quickly end in obscure description of inconsistent feelings.

5. Justice in a Production Context

We suggested already that the introduction of different productive contributions is a crucial step in any satisfactory theory of justice. It is not obvious, however, what economic model could be used to investigate moral intuitions with respect to this problem. We will therefore work the other way round: we will first show some results and then use these to venture some tentative comments on a few economic models. To structure the problem, we will start from the same question format as in the previous section.

A first case is described in Table 4. Variant (a) is still closely related to the pure surplus sharing problem, the only difference being the explicit statement that both agents work equally hard. The original wage difference is due to the different seniority of an employee and a probationer. The results are similar to those in Table 1: equal and proportional division of the extra largely dominate, whith somewhat more than 40% choosing the proportional rule.

The second variant in Table 4, however, shows a dramatically different picture. Here we certainly leave the pure distribution problem since it is stated that the

Table 4. "Two civil servants work in the same office. One is a permanently appointed employee with 15 years of service, earning 50 000 BF a month. The other is a probationer, earning 30 000 BF a month. They do the same job

((a) and work equally hard; (b) but the probationer works harder than his senior colleague).

An extra of 8 000 BF must be divided between the two of them. What would you consider to be a fair distribution?"

Distribution		% of respondents	
Employee	Probationer	Equal effort	Unequal effort
8 000	0	1.7	0
6 000	2 000*	1.7	–
5 000	3 000	41.7	10.3
4 000	4 000	45.0	17.2
3 000	5 000	3.3	46.6
2 000	6 000*	3.3	5.2
1 000	7 000*	–	3.5
0	8 000	3.3	17.2
N		60	58

* The asterisks denote distributions which have been added by the respondents

probationer works harder than his senior colleague. Note that this is only a very vague indication of a difference in contributions: no numbers are attached to it and an unambiguous measurement obviously is impossible. Yet it is already sufficient to overthrow completely the rules found until now. Almost three quarters of our respondents now give a larger part of the premium to the probationer. Vague indications of this kind will very often be available in actual distribution situations and its dramatic effects illustrate the importance of differences in contributions to the notion of distributive justice.

The result that differences in effort overrule seniority becomes more striking, when we consider it against the background of actual wage scales. In most economic organizations seniority, educational level and hierarchical position are the main factors explaining income differences, while effort in general has a marginal impact only. We therefore wanted to examine whether the same strong effect of effort is found when seniority is replaced by hierarchical position or by educational level and when the extra to be divided is substantially bigger. The results are shown in Table 5. Note that in this case we have given a quantitative indication of the difference in effort.

The variants with "equal effort" again are very similar to the pure surplus sharing problem: proportional and especially equal division of the premium largely dominate. Almost no respondents use the premium to compensate for the existing pay differences, although this would be the obvious choice if one feels that educational and hierarchical differences are not acceptable as reasons for income differences. In fact, combining the different results described up to now, we see that the ranking over the different variants of percentages of respondents choosing a proportional division closely follows the ranking of acceptable reasons for income differences, found in much other empirical work (see e.g. Schokkaert and Lagrou [11]). It can therefore be hypothesized that respondents will use that rule if they

Table 5. "((I) Two salesmen from the same firm are working on a fair. Johnson has a university degree and earns 50 000 BF a month. Peters is unqualified and earns 30 000 BF a month; (II) On a fair the salesman Johnson and his assistant Peters are doing good business. Johnson normally earns 50 000 BF a month, while Peters earns 30 000 BF a month).

Their joint success yields them an extra premium of 240 000 BF. What do you consider to be a fair division of the premium when you know

((a) that both men have made an equal contribution to the success; (b) that Peters has been twice as much on the stand as Johnson)?"

Distribution		% of respondents			
		I. Education		II. Hierarchy	
Johnson	Peters	(a) Equal effort	(b) Unequal effort	(a) Equal effort	(b) Unequal effort
160 000	80 000	4.9	0	0	5.3
150 000	90 000	14.6	10	28.2	7.9
140 000	100 000*	2.4	2.5	–	–
135 000	105 000*	2.4	–	–	–
130 000	110 000*	–	7.5	2.6	–
120 000	120 000	70.7	20	66.7	21.1
110 000	130 000*	2.4	–	–	2.6
90 000	150 000	2.4	30	2.6	10.5
80 000	160 000	0	30	0	52.6
N		41	40	39	38

* The asterisks denote distributions which have been added by the respondents

accept as fair the original income difference and otherwise divide the surplus equally. The link between the formal models and psychological and sociological empirical work readily suggests itself.

In the "unequal effort" conditions, claims based on personal position and past efforts are again swept away by the need to reward actual effort. In both cases almost two thirds of the subjects compensate for the differences in efforts shown and in the "hierarchical" condition more than half of the subjects divide the extra proportionally to these efforts. We should perhaps be careful with the interpretation of this result: indeed, our questions refer to the division of a premium and *not* to the wage scale itself. Moreover, this is probably the right place to remind of the fact that our respondents are students with no vested interests at all. (But this is perhaps the right ethical stance?) Nevertheless, it is difficult to escape the conclusion that people tend to attach much more importance to the reinforcement of effort than is current practice in economic organizations. If effort is so dominant in justice evaluations, this attitude possibly could rest on the assumption that the effort shown leads to desired results. It is possible that our respondents associate effort with output and then distribute income proportionally to output. To see whether there is more than such simple link between fairness and productivity we have to examine whether all individual characteristics, leading to a higher output, get the same ethical valuation. Many people argue that one should make a distinction between innate capabilities and effort. To see whether this distinction is drawn by our respondents we constructed the case presented in Table 6.

Table 6. Two salesmen, Mr. M and Mr. G, are employed by the same cosmetics firm. Both do the same work.

((a) As Mr. M now and then makes an extra effort, he brings in more orders, i.e. 60 a month, while Mr. G gets 40 orders a month; (b) They both work equally hard, but because of his natural charm, Mr. G gets 60 orders a month, while Mr. M brings in 40; (c) Mr. G has more natural charm, but Mr. M sometimes makes an extra effort, so that both bring in the same number of orders, i.e. 50 a month.)

Both earn 40000 BF a month. A monthly bonus of 10000 BF is to be divided between the two of them. What would you consider to be a just division of that bonus?"

Distribution		% of respondents		
Mr. G	Mr. M	Variant (a)	Variant (b)	Variant (c)
0	10000	17.5	0	0
2000	8000*	5.0	–	–
3000	7000*	5.0	–	–
4000	6000	57.5	2.6	16.7
5000	5000	2.5	41.0	83.3
6000	4000	7.5	56.4	0
10000	0	5.0	0	0
N		40	39	42

* The asterisks denote distributions which have been added by the respondents

In variants (a) and (b) the output levels are in the same proportion. In variant (a) the difference is due to effort and the wish to compensate for this effort indeed is very strong: only 15% of the sample do not give Mr. M a larger part of the bonus, and more than a quarter of the subjects give him a more than proportional compensation for his effort. In variant (b) 56% of the sample chooses a proportional division when the output difference is due to charm. However, about 40% of the respondents divide the bonus equally. The two variants, which are formally identical if we would only consider output, apparently elicit different responses. "Productivity" is not sufficient as a fairness indicator in a production context.

These observations perhaps could lead to the hypothesis that effort will be rewarded in variant (c). Indeed, 17% of our respondents compensate for the efforts of Mr. M, while no one rewards the natural charm of Mr. G in this situation. The overwhelming majority of respondents, however, keeps to an equal distribution of the bonus, i.e. proportional to output. We therefore are inclined to believe that effort will be highly rewarded *only* if it is 'efficient", in that it yields a higher output. Of course, this last conclusion must be considered as an hypothesis only.

The question whether a just distribution should compensate for differences in productivity following from natural abilities probably is the most basic one for the problem of justice in a production context. Table 6 (and also Table 1) suggests that about half of the respondents feel that higher ability should not lead to a higher income, while the other half has the opposite intuition. Perhaps this is a point, where it will be very difficult to reach social consensus, while at the same time a different position here may lead to fundamentally different conceptions of justice. The basic character of these questions may be illustrated with some examples.

In the theory of fairness (and envy-free allocations), Varian [13] has defined the concepts of an income-fair and a wealth-fair allocation. The former corrects for the distribution of abilities, while the latter does not correct for this distribution at all. If our respondents knew these theories, they would probably show the same disagreement as with respect to our case 6. If we believe that no consensus is possible over the basic question, this is about as far as we can go in a fairness-framework. All attempts in the literature to define compromise solutions are then rather meaningless. In fact, any intermediate solution would be worse as a conception of justice, unless it can be shown that it gives an answer to the basic question, which is acceptable for supporters of both camps. This may be very difficult indeed.

Another illustration may be taken from Roemer's paper [10]. He shows the limitations of the bargaining framework and the possibilities of mechanism theory performed on economic environments by applying them both to what he calls the Cohen problem, formulated as follows: "Consider the problem of Able and Infirm, who jointly own the land in the world and who each own themselves. The land is used to produce corn, which they each need or want to consume. There is a known technology for producing corn: Able is skilled in producing corn, and Infirm is less skilled or unable to produce corn. How much corn should be produced, who should produce it, and how should it be divided between them?" Our results immediately suggest some remarks here. First, for half of our respondents this problem is trivial. Since they do not accept income differences on the basis of differences in innate capabilities, they would immediately choose an egalitarian solution (which indeed is one of the "quasi-acceptable" mechanisms with Roemer's axioms [10]). Second, a much more difficult problem for all of our respondents would be the case of Industrious and Lazy, both equally skilled and jointly owning the world. But that problem is difficult for theory also. People *choose* to work hard or not, so being industrious or lazy probably must be represented through the utility function (and the marginal rate of substitution between work and consumption). In fact, this explains why effort is so generally accepted as a differentiating criterion: people are supposed to be responsible for their preferences, but not for their abilities. If we follow this line, it seems that it leads us immediately to the conclusion that we have to work with *ethical* environments, because we have to name what the utility function measures. Surely, someone who reveals that he likes to work harder is treated differently from someone with expensive tastes.

Let us make one final remark: if indeed no consensus can be reached over the just treatment of people with different abilities, thinking need not stop there. From a theoretical point of view, one can further explore the consequences of these diverging opinions. From an empirical point of view, it remains fascinating to discover whether the distribution of these opinions over different social groups (or personalities) shows a meaningful pattern.

6. Conclusion

In this paper we have argued that formal theories of justice cannot neglect the moral intuitions existing in society. Research on such intuitions might suggest where and why formal models are still defective and in what direction they can be improved.

This last, constructive, possibility becomes more important if we work within a broader framework than the welfarist or bargaining ones, which have been so popular in economics until now.

We illustrate these ideas with some empirical results, obtained for a sample of 243 first year university students. Our questionnaire made use of concrete cases, for which our respondents had to indicate what they considered as the just distribution.

We first showed that the surplus sharing problem, as analysed by Moulin [8], is an attractive starting point for empirical research. It is likely that our respondents choose a proportional division of the surplus if they agree with the original income differences. One should be careful, however with the application of this and the (obverse) cost sharing model to all formally similar real world situations. It was shown that our respondents reacted differently to the division of a tax and the division of the cost of a collective good. Acquired rights also seem to be important.

All results change, however, as soon as we introduce differences in effort. These differences completely overrule all other reasons for income differences, including seniority, hierarchy and education. Remuneration of effort also is more generally accepted than the remuneration of innate capacities. Our respondents especially disagree about this last point, which seems to be the most basic problem for the analysis of justice in a production context. We argue in the paper that economists perhaps should accept that consensus over this point will be very difficult to reach. Moreover, we suggest that the introduction of these findings in formal model construction might necessitate mechanism theory on the domain of ethical environments.

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