By Invitation

A Questionnaire-Experimental Study of Equity Evaluations Over Time

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Most of the studies in empirical social choice are snapshot-like. These studies do not allow to check whether the results found are intertemporally stable or not. The author presents here his findings which stretch over a period of roughly 15 years regarding the two situations that were given to (mostly) undergraduate students in economics and business administration at the University of Osnabrueck in Germany. The first situation required that a decision be made between improving the everyday life of a handicapped person and offering education to intelligent children. The second situation required the respondents to take a decision between promoting economic growth at the expense of restricting basic human rights and a slower economic recovery with a full warranty for these human rights. The results show significant changes in the evaluative behaviour of the students over the period considered.

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Introduction

Empirical social choice is a relatively new area within the theory of collective decisions. As far as the theory and empirical investigation of voting behaviour is concerned, a broad overview has recently been published in a book by Regenwetter et al. (2006). As far as the empirical analysis of distributive issues is concerned, apart from two longer surveys by Gaertner (2007, 2009), a book is not yet available. Yaari and Bar-Hillel(1984) were probably the first to study the concept of distributive justice empirically. What the authors did was to elicit judgments of justice to various hypothetical questions that they gave to applicants for admission to Hebrew University. More concretely, roughly equal numbers of young men and women were confronted with hypothetical distribution problems that they were asked to "solve justly" (Bar-Hillel& Yaari 1993:59). The authors emphasize that the focus of their research was the ethical notions in people's minds, not their actual behaviour, recognizing that the

actual behaviour "is inevitably contaminated by political, strategic, and other considerations"(1993:59). They add that "it is people's expressed sentiments (namely what they say ought to be done) rather than their revealed ones (namely that they actually do) that primarily guides the search for *normative* theory of justice, as well as the rhetoric of public debate on issues of distributive justice.

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The general public definitely has an opinion on issues of distributive justice. This view may at times be quite vague and may depend on the particular context into which the problem is embedded. As a most recent example, take the public discussion (or should we say uproar?) in relation to bonuses and pension claims of various bank managers in the U.S., the U.K. and elsewhere. So opinions on equity exist and should be taken into consideration in a political democracy. Schokkaert (1999) argues that if normative economics wants its analysis to have real influence on the decisions taken within a political system, it has to consider the opinions and preferences of its citizens. If the political sphere neglects the latter, public support for a particular distributive policy and its implementation are doubtful. Empirical research on the ethical notions in people's minds may therefore be helpful.

In their empirical investigation Bar-Hillel and Yaari studied situations where students were asked to divide a bundle of goods between two persons in order for the division to be just. The division problem was embedded in different contexts, viz. a context of needs, a context of tastes and a context where beliefs mattered. The utility functions behind the two recipients of the goods were designed in such a way that numerically, they were exactly the same in all three contexts. However, the students' evaluations for the three contexts differed sharply. In the case of needs, a maximin-oriented decision was clearly dominant, in the case where tastes were the predominant feature, a utilitarian-type decision was chosen most frequently, in the case of beliefs a large group of students favoured the equal-split solution. These findings provide strong support for the position that the consideration of vectors or numbers of individual utilities alone is by no means sufficient in order to analyze a distribution problem adequately. Clearly, the two authors' results can be seen as an empirically substantiated argument against welfarism (see e.g. Sen 1979), a position which claims that what counts when one evaluates social states is the information on individual utilities only.

Bar-Hillel and Yaari replicated their experiments at several instances both in Israel and the United States during the years 1978-1981. They assert that the response patterns of these investigations were very similar to those of the applicants to Hebrew University. So for the time period given and for the student

samples available to the two authors, a certain kind of "reflective equilibrium" (Rawls 1971) was, perhaps, reached. A reflective equilibrium can be viewed as the final stage of an iterative process of self-correction and revision (Yaari& Bar-Hillel 1984:2-3). This process starts out from a collection of axioms that a distribution mechanism ought to have. The issue is whether there exists a distribution mechanism that in fact satisfies all these axioms. Once this problem is resolved, one must ask whether there are other mechanisms that fulfil these axioms as well. All these mechanisms, once identified, have to be scrutinized in order to possibly discover additional properties that they possess. If some of these are deemed undesirable or untenable, the whole process has to start anew. The end of such an iterative procedure hopefully is a state of convergence with no further revisions needed. Such a state (one may refer to the concept of equilibrium) is considered tenable since it survived an iterated test in which it was confronted with evidence. The latter is based on observed ethical judgments or moral intuitions. If the prescriptions of a distributive mechanism are too much at variance with observed ethical judgments, they are considered untenable. The members of society will not accept them as guiding principles. Since, as stated above, Bar-Hillel and Yaari found that the response patterns of various investigations were very similar, different, though, in different contexts, their results may reflect a state of reflective equilibrium, at least for the period of investigation.

Unfortunately, Yaari and Bar-Hillel did not replicate their experiments over a longer period of time (nor do we know of any other researcher who reiterated the authors' situations at other places and at different points in time) so that we do not know whether the results would have remained stable over time or would have changed in a particular way. This is a pity since both the inter-temporal stability of the results and, alternatively, a systematic change would have provided important insights. In the latter case, one might perhaps speak of a path of short-term reflective equilibria. Scientists are not interested in short-period occurrences or "flukes" but in structures, be they stable over time or changing in a systematic way.

There hardly are any studies in empirical social choice which have looked at the time dimension.

Regrettably, to the best of our knowledge, there hardly are any studies in empirical social choice which have looked at the time dimension. Therefore, for this essay, we present and discuss our own findings that stretch over a period of roughly 15 years. Due to limitations of space, we shall only present a smaller part of our own investigations and we shall focus exclusively on the dimension of time (see for details Gaertner & Schwettmann 2007). These results were obtained from students of economics and business administration at the Unversity of Osnabrueck in Germany. Students were invited to evaluate particular situations of a distributive character in a

questionnaire-experimental set-up. The results were attained from small groups of students gathered in tutorials to prepare for the exam in microeconomics at the undergraduate level.

In section 2, we briefly describe the theoretical background of our empirical analysis and present the exact formulation of two situations that we gave to the students. Section 3 discusses the results of our investigations, provides some preliminary statistical tests and then offers an econometric analysis. An interpretation of our findings is given in section 4.

2.Two Situations to Be Evaluated

The two situations that we shall discuss in the sequel were analyzed together with several other cases that can be found on the internet[1].

The first situation requires a decision between supporting a handicapped person or teaching intelligent children. The second situation requires that the students make a decision between a set of measures for rapid economic growth at the expense of some basic human rights and a slower economic recovery going hand in hand with a full restoration of these human rights. The structure of both situations is such that there is always one (group of) person(s) who is unambiguously worst off under two alternatives x and y. That (group of) person(s) is better off under x than under y, whereas all the other (groups of) individuals who are introduced successively are better off under y than under x .

Such a constellation is closely related to the one which the equity axiom considers that underlies the Rawlsian (1971) maximin principle. The equity axiom makes a particular demand for a society of only two individuals or, more generally, for a society where only two individuals are affected by a change from one policy to another. Let us be more precise. We assume that only two policies are available. Let us call them x and y. We postulate that person 1 prefers x to y, person 2 prefers y to x and, independently of whether x or y will eventually be the social outcome, person 2 is always better off than person 1. For such a situation, the equity axiom requires x to be socially preferred to y.

The question that we posed to ourselves was whether individuals follow this axiom in their judgments. To be more precise, our question actually was twofold. First, we wanted to know whether the students' evaluations follow the demands of the equity principle. Secondly, we asked ourselves whether those who fulfil this axiom, would follow it unconditionally, i.e., focus always exclusively on the worst-off members of society. Clearly, a shift of the focus away from the worst-off is a move away from the Rawlsian maximin principle.

1. The internet address is http://www.vwl-theorie.uni-osnabrueck.de/Basic.pdf for the questionnaire. All in all, we had given six different situations to the students.

In Gaertner (1992), we made the following suggestion in order to check for a fulfilment of the equity axiom. Let us consider the following two-person profile of the so-called extended orderings $\emptyset_i$, $i \in \{1,2\}$:

$\emptyset_1$: $(y,2)(x,2)(x,1)(y,1)$
$\emptyset_2$: $(y,2)(x,2)(x,1)(y,1)$

These two orderings which are identical should be read such that both individuals agree that it is best to be person 2 under policy y. This is considered as better than being person 2 under x. Again, this is better than being person 1 under x which is better than being person 1 under y. According to Rawls' equity axiom, state x is declared as preferable to state y. We now enlarge the basic profile above by adding the extended orderings of persons 3,4,…, thereby preserving the structure above. In other words, there is unanimous agreement that the individuals who are entering our consideration always prefer y to x for themselves and furthermore their position both under y and under x is deemed better than all the positions of the hitherto considered individuals with respect to y and x. So for four individuals, we would, for example, have the unanimous verdict R_i, i€{1,…, 4}:(y,4)(x,4)(y,3)(x,3) (y,2)(x,2)(x,1)(y,1). What we have then done was to ask the students how they would wish to resolve the different situations. All those respondents who "accept" the equity axiom (without having been introduced to this axiom, of course) will say with respect to the initial two-person profile that x is the preferred state. Will they also find x preferable when the third person is introduced, when the fourth person enters etc.? It is very likely (but not necessarily so) that at some point in this successive questioning, one or several of the individuals will wish to switch from declaring x as the better state to "now y should be preferred to x socially." However, it could also be the case that, given the size of the considered society, a respondent would always want x to be socially preferred to y, meaning that this student would follow the spirit of the equity axiom throughout the complete sequence. And we should not forget that there will be students who will violate the equity axiom already in the base situation.

Here are the two situations we wish to focus on.

Q.1:

(o)A small society has received a certain amount of money which can be used either to provide some help and assistance for a handicapped person or to further the education of an intelligent child. The child could receive good education in languages and in natural sciences, let's say. Let the handicapped person be person 1; if the sum of money were used for her support (alternative x), she would be able to learn some very basic things, so that at least in certain areas of daily life she would no longer be totally dependent on the assistance from other people. Let the intelligent child be person 2; the investment into its edu-

cation represents alternative y. The interpersonal welfare ranking reads:

$(y,2)(x,2)(x,1)(y,1)$

Which alternative should be realized in your view, x or y?

(a) Imagine that the sum of money which could be used to help the handicapped person, is so large that, on the other hand, this amount would suffice for the education of not only person 2 but also a second child (person 3) who is even somewhat more intelligent than person 2. Person 3 would, therefore, benefit even a bit more from the education so that the following interpersonal welfare ranking can be assumed:

$(y,3)(y,2)(x,3)(x,2)(x,1)$
$(y,1)$

Would you choose x or y under these conditions?

(b) Imagine that if the money were used to finance alternative y it would be possible to educate still another child (person 4). The reason may simply be 'economies of scale' or the fact that a talented teacher will be able to provide good education for several children simultaneously. Let us assume that all the other characteristics of the situation remain as before. The interpersonal welfare ranking now reads:

$(y,4)(y,3)(y,2)(x,4)(x,3)$
$(x,2)(x,1)(y,1)$

Which alternative should be picked in your view, x or y?

(c) Add another child to the situation (person 5), who could also receive instruction in languages and the natural sciences out of the given budget. Everything else remains the same and the interpersonal welfare ranking reads:

$(y,5)(y,4)(y,3)(y,2)(x,5)$
$(x,4)(x,3)(x,2)(x,1)(y,1)$

Would you want x or y to be realized?

Q.2:

(o) Imagine a country which had been totally run down economically by a long-lasting dictatorship. Finally, the country could get rid of this dictatorship. Furthermore, imagine that an international bank group is offering a rather large loan (under very favourable conditions of repayment) to this country for economic reconstruction (alternative y). However, the consortium declares that the prerequisite for this loan should be that the employees in the country be granted neither a right to strike nor the free choice of occupation. This precondition would remain valid for the foreseeable future. If the new Government were unwilling to enforce this curtailment of individual rights, no loan would be offered, and, therefore, the country would have to pull itself up by its bootstraps (alternative x). In that case, the country would, of

course, have the option to reinstall the right to strike and other basic rights, a measure which had been promised to the citizens of the country after the fall of the dictatorship. If the bank loan were granted, the large enterprises (group 2) would be the first to experience an economic recovery. The workers and employees in the firms (group 1) would be hard hit by the restriction of basic rights. The interpersonal welfare ranking, therefore, reads:

$(y,2)(y,2)(x,2)(x,1)(y,1)$

What should the country do in your view, should it decide in favour of y or x?

(a) Imagine that the initial situation were to undergo the following modification: The loan which is offered would have such a large volume that an additional group of the population, the self-employed persons with a small or middle-sized business activity, let's say, would benefit from the financial aid (group 3). Let this alternative again be denoted by y. Alternative x remains as before. The following welfare ranking is now postulated:

$(y,2)(y,3)(x,2)(x,3)(x,1)$
$y,1)$

Should the country choose x or y?

(b) Imagine again a change of the initial situation: the bank loan offered is so large that under alternative y still another group of the population, the civil servants, let's say, would realize larger economic benefits (group 4). Alternative x remains unchanged. The interpersonal welfare ranking now reads:

$(y,2)(y,3)(y,4)(x,2)(x,3)$
$(x,4)(x,1)(y,1)$

Which alternative should now be picked by the country?

(c) A further variation: we shall assume that still another group within the population, the retired members of society (group 5), would experience an improvement of their economic situation under alternative y. Alternative x remains unchanged. The following welfare ranking is now postulated:

$(y,2)(y,3)(y,4)(y,5)(x,2)$
$(x,3)(x,4)(x,5)(x,1)(y,1)$

Which alternative should now be chosen according to your view, x or y?

The first situation clearly reflects aspects of needs. In the second situation, one may argue that needs are the primary characteristics as well. However, this situation can also be viewed as describing a dilemma between basic human rights and economic benefits. Therefore in the second situation one could argue with some justification that here it is not the equity axiom which is being put to an empirical test but what is being tested is the lexicographic priority of Rawls' first

principle, the priority of liberty over the second principle of justice. Rawls said in chapter 39 (: 247) of his Theory of Justice that it may make sense to renounce part of the freedom "when the long run benefits are great enough to transform a less fortunate society into one where the equal liberties can be fully enjoyed". But note that the needs aspect is nevertheless present in the second situation. Remember that Rawls represented the overall situation of a (group of) person(s) by an index of primary goods which included both rights and liberties but also material well-being in terms of income and wealth.

In the second situation, the students in Germany can be viewed as "external observers" or external judges. In other words, their identification with the position and circumstances of a particular person was only of an indirect nature. This may also have been the case in the first situation. On second thought, however, this need not necessarily have been the case here. On the one hand, at least some students may have identified to a certain degree with the children to be educated. On the other hand, imagine that a respondent himself turned out to be a handicapped person or that one member of his family or a close friend was handicapped. Of course, we do not know this since our questionnaires were treated anonymously. But had it been the case, it would certainly have mattered.

3.Results & Their Interpretation

We now present and analyze our results from Osnabrueck University during the years 1989-2003. Covering a longer period of time enables us to investigate inter-temporal aspects though we are fully aware that this should be done very cautiously.

Before we describe some of our findings, we have to explain some digits and numbers as they appear in the following tables and explanations. "0" always represents a choice of alternative x,whereas "1" stands for a decision in support of alternative y. The sequence "0000" represents those students who choose alternative x in all the cases, i.e. in the base situation and in all its variants. They fulfil the equity axiom and, moreover, always stick to this decision in favour of the worst-off person or group. The sequences "0001", "0011", and "0111" correspond to verdicts of those students who initially decided in terms of the equity axiom, but revised their choice later on. Sequences such as 0101 or 1100 also display an alteration of the initial decision but they are difficult to interpret; we tend to call them "unintelligible". Fortunately, they hardly occur. Regarding Table 1, the numbers in the columns of the two situations give the percentages of answers within each concerned cohort. Furthermore, the relative frequency of the three "coherent" revisions of the original decision in support of the worst-off (a conclusive "switch" from "0" to "1") can be found in the lower part of the table. All those sequences beginning with "0"(i.e. the first eight rows in the table) represent respondents who satisfied the equity axiom initially. Their relative frequencies are also given at the end of the table. Correspondingly, those sequences

starting with "1" hint at a violation of the axiom.

Table 1 contains information on the two situations for all concerned years, which we now wish to comment on successively[2]. Starting with situation 1 in 1989, 92.3% of the interviewed students initially supported the handicapped person and, therefore, decided against the education of one intelligent child. Hence, they fulfilled the equity axiom. When, afterwards, the number of better-off persons was increased, just 19.8% of the probands revised this decision, while 72.3 % wanted to give the money to the handicapped unconditionally, i.e. in all the cases. Moreover, only 7.7 % of the respondents wanted the money to go into education of the gifted child right away. Concerning the evolution of these results over time, we find remarkable differences. Although the great majority of the students fulfilled the equity axiom in the following years, their proportion continuously declined to 85.9% in 2003. Also,

Table 1: Investigations in Osnabrueck

Relative Frequencies for All Possible Decision Patterns Sample Sizes: n=65 for 1989, 93 for 1990, 81 for 1993, 80 for 2002 and 99 for 2003(x coded as 0, y coded as 1)

Sequence				Situation 1					Situation 2				
				1989	1990	1993	2002	2003	1989	1990	1993	2002	2003
0	0	0	0	0.723	0.581	0.494	0.400	0.323	0.739	0.548	0.593	0.525	0.364
0	0	0	1	0.046	0.086	0.062	0.038	0.040	0.046	0.065	0.099	0.075	0.081
0	0	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	0	1	1	0.077	0.151	0.151	0.188	0.232	0.015	0.097	0.037	0.038	0.091
0	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	1	0	1	0.0	0.0	0.0	0.0	0.020	0.0	0.0	0.0	0.0	0.010
0	1	1	0	0.0	0.0	0.0	0.013	0.0	0.0	0.0	0.0	0.0	0.010
0	1	1	1	0.077	0.086	0.086	0.238	0.242	0.031	0.075	0.074	0.100	0.152
1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.013	0.0
1	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.010
1	0	1	1	0.0	0.0	0.0	0.0	0.010	0.0	0.0	0.0	0.0	0.0
1	1	0	0	0.0	0.011	0.011	0.0	0.010	0.0	0.0	0.012	0.025	0.0
1	1	0	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.010
1	1	1	1	0.077	0.086	0.123	0.125	0.121	0.169	0.215	0.185	0.225	0.273
% Switch				19.8	32.1	38.3	46.3	51.5	9.2	23.7	21.0	21.3	32.3
% fulfillment of equity axiom				92.3	90.3	87.7	87.5	85.9	83.1	78.4	80.3	73.8	70.7

2. Only those questionnaires were included, which contained complete answers on all situations and also on all demographic questions. Consequently, incomplete survey forms have been left out. However, the results do not change significantly by this sample reduction. This is also the case for a further sample of the year 1994, where no demographic characteristics are available. The results of that year are quite similar to our findings from 1990.

the relative frequency of the sequence "0000" goes down to 32.3 % in 2003, which is considerably lower than the corresponding values of the period between 1989 and 1993. Only in part this finding is due to a movement towards the sequence "1111". Rather, in the year 2003 more than 51% of the respondents revised their initial decision in favour of alternative x. Furthermore, the continually increasing proportion of the sequence "0111", referring to an earlier switch from x to y, is remarkable.

To summarise, we observe a tendency away from an unconditional fulfilment of the equity axiom. More concretely, the support for alternative y increased over time for cases where two or more than two intelligent children are considered.

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Presenting a decision problem involving basic human rights on the one hand and a quick economic recovery on the other hand makes situation 2 quite complex. As the results in Table 1 show, like in situation 1, the equity axiom was fulfilled by the great majority of the students in the year 1989. Moreover, 73.9 % of the respondents stated that basic human rights which affect the working class in particular should obtain absolute priority, no matter of what size the group benefiting from the loan might be. The proportion of those probands revising their original decision later on was considerably low in 1989. Analysing again the inter-temporal development, we find a tendency towards favouring those groups in society who would benefit from a quick economic reconstruction at the expense of human rights since the year 2002. Most notably, the differences between the figures from 2003 and the results of our investigations in the years 1989 and 1993 are astonishing. For example, the frequency of the sequence "0000" was substantially lower than in all other years before. Thereby, analogous to situation 1, the decrease in the frequencies of an unconditional support of the worst-off in the years 2002 and 2003 was accompanied by a lower fulfilment of the equity axiom. This proportion declined from 83.1% in the year 1989 to 70.7% in 2003. In addition, both an increased frequency of a revision and a higher occurrence of the sequence "1111" in the year 2003 can be observed. Therefore, in 2002 and, particularly, in 2003 the absolute priority of basic human rights declined compared to the desire for a quick economic recovery. The influence of the inter-temporal effect in this and the first situation will be discussed below.

Preliminary statistical tests can be used in order to see whether the so far purely descriptive results may hold under more advanced investigations. Hence, we applied $\div^2$ tests and tried to generate evidence against the hypothesis H_0 that the distribution of responses is identical over the considered years. The results of these tests are summarised in Table 2. Especially in situation 1, statistically significant differences between the earlier and the later years of the investigation can be observed. Furthermore, for situation 2 the

Table 2: ÷² Tests for Two Independent Samples

	Year	Corresponding Situation in Year			
		1990	1993	2002	2003
Situation 1	1989	4.59	8.22*	17.32***	28.05***
		(5)	(4)	(5)	(7)
	1990		4.99	13.74**	20.78***
			(5)	(6)	(7)
	1993			3.47	9.57
				(5)	(7)
	2002				5.64
					(8)
Situation 2	1989	8.18*	5.20	9.24	25.10***
		(4)	(5)	(6)	(8)
	1990		4.36	6.10	10.65
			(5)	(6)	(8)
	1993			2.57	15.35*
				(6)	(9)
	2002				12.81
					(10)

Note : Given are ÷² test statistics. Level of significance: *10%, **5%, ***1%.
Degrees of freedom are reported in parentheses

answers in 2003 differ considerably from some of the other samples.

To sum up, the results suggest a certain evolution in the response patterns over time. Not only in situation 1, but also to some extent in situation 2, astonishing changes can be observed. However, these important findings could simply be due to heterogeneous sample compositions in different years. In order to further examine the empirical and statistical robustness of the results, we use a standard probit regression model including several socio-demographic characteristics of the respondents.

To some extent, the sample means of these attributes vary over time thus revealing a lack of homogeneity among the groups to be compared. To allow for these differences we use a standard probit regression model of the overall sample. Three binary response patterns are of particular interest which we try to distinguish in the following investigation in order to reflect our earlier approach to the descriptive data: Besides the fulfilment of the equity axiom, the "coherent" revision of an initial decision in favour of the worst-off person on the one hand, and the unconditional support of these (groups of) person(s) on the other, serve as dependent variables. Explanatory factors are summarised and described in Table 3.

The variable coded as TIME allows for inter-temporal effects. In order to distinguish samples from different academic terms of the same year, it is measured in number of semesters - rather than years - since the first study. Other variables are

more or less self-explanatory: Age, gender and parental background are standard socio-demographic attributes. Moreover, we are able to distinguish between Business Administration and Economics (either as a major or subsidiary subject) students, and also have information about their job experience. Additional dummy variables allow future income expectations of the proband to have an influence on the equity evaluations.

Table 3: Variable Descriptions: Samples of Osnabrueck

Variable Code	Description	Osnabrueck 1989-2003(n= 418) Mean	S.D
AGE	Age of proband (in years)	22.76	1.80
BA	B.A.student: 0=No,1= yes	0.86	0.35
JOB	Proband has job experience: 0=No,1= Yes	0.38	0.48
MALE	Proband is male:0=No,1=Yes		
RES	Questionnaire version: 0= No responsibility, 1= Responsibility	-	-
TIME	Number of semesters since the first study in winter 1989	13.60	11.99
Future income: Proportion of the citizens expected by the proband to earn less than the proband in 10 years time:			
FUTURE 1	Less than 50%	0.12	0.33
FUTURE 2	50%	0.40	0.49
FUTURE 3	More than 50%	0.48	0.50
Parental background: Profession of the main earner of the family in which the proband grew up:			
PARENTS 1	Worker, craftsman	0.16	0.37
PARENTS 2	Employee or civil servant in the public sector	0.26	0.44
PARENTS 3	Employee in the private sector	0.28	0.45
PARENTS 4	Self-employed	0.30	0.46

The maximum likelihood estimates of 6 probit models for the two situations are summarised in Table 4. We can confirm a lack of overall explanatory power of the independent variables for the observed variances in the answering patterns. However, this is not surprising if one expects ethical judgements to be randomly distributed over the population. Nevertheless, our estimates reveal some factors having a significant influence on the decisions, whereas others are of no importance for the considered response patterns. Both of these possible findings should be interesting. In situation 1, older students are somewhat more likely to support the handicapped person unconditionally instead of revising their initial statement later on, but there is no clear impact of the proband's age on the answers in situation 2. Furthermore, there is no effect from studying business administration instead of economics. The results on the influence of gender and job experiences are more complex in our investigation. In order to allow for interaction effects we tested several

Table 4: ML Estimates of Probit Models

Independent Variables	Situation 1 (n=418)			Situation 2 (n=418)		
	Fulfilment of equity axiom	Switch	Sequence 0000	Fulfilment of equity axiom	Switch	Sequence 0000
CONSTANT	2.0706	1.4384	-1.1930	0.0112	0.0935	-1.2765
	(1.4369)	(1.0956)	(1.0834)	(1.1800)	(1.2016)	(1.0735)
AGE	0.0010	- 0.0882*	0.0817*	0.0680	-0.0215	0.0705
	(0.0628)	(0.0483)	(0.0477)	(0.0517)	(0.0526)	(0.0470)
BA	-0.1129	-0.0402	-0.0401	-0.2661	-0.0287	-0.1972
	(0.2514)	(0.1874)	(0.1857)	(0.2156)	(0.2085)	(0.1873)
JOB	-0.2382	0.4932**	-0.5923**	-0.4806*	-0.1861	-0.1905
	(0.3469)	(0.2402)	(0.2406)	(0.2652)	(0.2558)	(0.2371)
MALE	-0.5416**	0.1799	-0.4230**	0.5508***	-0.5675***	-0.0278
	(0.2476)	(0.1768)	(0.1773)	(0.1963)	(0.1910)	(0.1731)
MALE*JOB	0.3053	-0.5505**	0.7084***	0.3673	0.6679**	-0.2001
	(0.3792)	(0.2740)	(0.2725)	(0.3006)	(0.2952)	(0.2697)
TIME	-0.0093	0.0222***	-0.0283***	-0.0146**	0.0115*	-0.0213***
	(0.0072)	(0.0056)	(0.0056)	(0.0061)	(0.0062)	(0.0055)
FUTURE 2	0.1322	0.0322	0.0675	0.1416	-0.2275	0.4083*
	(0.2923)	(0.2099)	(0.2110)	(0.2224)	(0.2205)	(0.2088)
FUTURE 3	-0.2537	-0.1565	0.0387	0.2092	-0.3389	0.5429***
	(0.2763)	(0.2075)	(0.2093)	(0.2190)	(0.2186)	(0.2070)
PARENTS 2	-0.2113	-0.0992	0.0087	-0.0938	-0.0181	-0.0419
	(0.2860)	(0.2028)	(0.2059)	(0.2246)	(0.2257)	(0.2039)
PARENTS 3	-0.1283	-0.1337	0.0250	-0.1443	-0.0201	-0.0969
	(0.2866)	(0.2028)	(0.2013)	(0.2181)	(0.2201)	(0.1987)
PARENTS 4	-0.3017	-0.1341	-0.0418	-0.0869	-0.0001	-0.0514
	(0.2775)	(0.2024)	(0.2014)	(0.2191)	(0.2194)	(0.2001)
LR Statistic	15.1856	28.7216***	37.6609***	15.8439	19.7712**	27.1602***
McFadden R^2	0.0510	0.0515	0.0350	0.03450	0.0444	0.0470
Mean dependent var	0.8852	0.3876	0.7679	0.7679	0.2249	0.5383

Note: Asymptotic standard errors are reported in parentheses. Level of significance:*10%,** 5%, *** 1%

interaction terms, one of them being remarkable: Especially in situation 1, job experiences of men considerably reduce the probability of switching so that there is a persistent support of the handicapped person, while there is a significant effect towards the revision of the initial decision for alternative x in situation 2. Hence, it is possible that experiences during compulsory military or, more likely, civilian service do have an influence. Particularly, the case of a handicapped person might have raised sympathy among these male students.

Due to the incorporation of this interaction effect, however, the coefficients of the binary variables *MALE* and *JOB* are conditioned on the respective variable in the product term being zero. For female

students (*MALE*=0) there are strong effects from having any job experience. Especially in situation 1, being employed significantly reduces the probability of the sequence "0000" and, instead, increases the occurrence of switching behaviour in favour of the better-off children. Moreover, the coefficients for the fulfilment of the equity axiom by women are negative in all situations and significant in situation 2. Hence, first of all, the effect of being employed seems to be depending on the underlying situation. In addition, there are some remarkable gender differences concerning the influence of job experiences.

There is a clear gender effect in situations 1 and 2 for the group of students without any job experiences (*JOB* =0). Male students fulfil the axiom less frequently in both cases. Additionally, in situation 1 men are more supportive of furthering the education of the intelligent, whereas in situation 2 there is significantly less switching behaviour among male respondents from basic human rights towards a quick economic recovery. It is important to recognise that, in our model, this effect is separated from other factors like age, which naturally differs among sexes due to previous compulsory services of male students. Moreover, our approach avoids gender differences to be due to different sample compositions in various years. Parental background variables seem to be of no importance for the response patterns.

Having controlled for several sociodemographic factors, our maximum likelihood estimates now enable us to state more robust findings concerning the presumed time trends. As shown by the coefficients of the variable TIME in Table 4, the intertemporal developments that have become visible in Table 1 can clearly be confirmed. In situation 1, we witness significantly less support of the worst-off individual over the considered time-span. The decline in the unconditional support of the handicapped person is significant at the 1% level. One might argue that the change in the fulfilment of the equity axiom, though negative, is not significant. Note, however, that the increase in switching behaviour is highly significant as well. In later years, respondents are much more likely to reconsider and revise a decision that initially was in favour of the handicapped.

Another look at Table 1 reveals that both the sequence "0111" and the sequence "0011" experienced a steady and strong increase over time. While in 1989 the frequency for each sequence was 0.077, the frequency for "0111" increased to 0.242, the frequency for "0011" went up to 0.232 in 2003.

Strong inter-temporal changes can also be observed for situation 2. The decline in the unconditional support of the basic rights is significant at 1% level. The fulfilment of the equity axiom also went down significantly which is mainly due to a strong rise in the support of sequence "1111". Due to a steady increase in the frequency of "0111" over time, switching also went up in a significant way.

4.Interpretation & Final Remarks

We said at the beginning that our focus in this paper is directed towards an investigation over time. The econome-

ric analysis just described clearly shows that in both the situations there have been considerable changes between 1989 and 2003. The most significant change occurred with respect to the sequence "0000", i.e. the unconditional support of the worst-off. Closely related to a decrease in the support of the worst-off is an increase in the switching behaviour of our students, again in both the situations. Concerning the idea of the existence of a reflective equilibrium, there is some evidence for one during the period 1989-90. This is supported by other data from 1990 that is not contained in Table 1 (see Gaertner & Jungeilges 2002: 37-38). A second equilibrium may have formed during the time-span of 2002-2003, but we say this with utmost caution.

An increase in future prospects is tantamount to an enhancement of opportunities and a rise in productivity.

What is quite remarkable is the fact that the students in Osnabrueck perceived the two situations as very similar. This is all the more surprising since the two situations are very different, at least at first sight. In situation 1, the issue is to weigh the situation of a handicapped person against the opportunities of intelligent children. In situation 2, a restoration of basic rights "competes" with an economic recovery. Clearly, a re-instalment of basic rights is different from alleviating the life of a handicapped individual, but the alternative in either situation can be subsumed under the aspect of efficiency. And indeed, several of our respondents mentioned in their verbal comments that an investment in education increases the future prospects and the wealth of a country. An increase in future prospects is tantamount to an enhancement of opportunities and a rise in productivity. Investment in economic reconstruction as proposed in situation 2 is very similar. New opportunities will arise and an increase in productivity is almost automatic. Of course, other arguments also played a role among our students. During the last 10-15 years, the budget of German universities has not risen in proportion to the increase in student enrolment. There is large agreement that the German university system is financially underfunded. Also, the PISA studies have not been too favourable towards the German educational system. All this may have led our respondents to attribute a greater weight to education in situation 1. In situation 2, a modified perception of labour unions may have had an influence. The word "strike" is immediately associated with their activities, be they justified or not. We believe that the basic issues underlying our investigation are of immediate importance for modern societies. Our starting point has been Yaari and Bar-Hillel's analysis based on social choice and bargaining theory. The repercussions of their investigation and of all those that followed stretch to the field of political economy.Further analyses along the time dimension are more than welcome.

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