SONDERFORSCHUNGSBEREICH 504

Rationalitätskonzepte,
Entscheidungsverhalten und
ökonomische Modellierung

No. 07-71

The role of power for distributive fairness

Julian Rode*
and Marc Le Menestrel**

December 2007

The authors thank Robin Hogarth, Nagore Iriberri, Rosemarie Nagel, Jordi Brandts, James Konow, Daniel Schunk as well as seminar participants at Universitat Pompeu Fabra, Universität Mannheim, Universität Konstanz and the ESA North American Meeting 2007 for their constructive comments. Financial support from the Deutsche Forschungsgemeinschaft, SFB 504, at the University of Mannheim, is gratefully acknowledged.

*Sonderforschungsbereich 504, email: jrode@sfb504.uni-mannheim.de

**Universitat Pompeu Fabra, email: marc.lemenestrel@upf.edu

Universität Mannheim
L 13,15
68131 Mannheim

The role of power for distributive fairness

Julian Rode[*] Marc Le Menestrel[♣♦]

jrode@sfb504.uni-mannheim.de

marc.lemenestrel@upf.edu

December 2007

Abstract: We employ an experimental labour setting to study fairness in the division of gains from productive activity. The focus is on the impact of power structures on allocation decisions and on fairness perceptions. Two types of actors are involved in generating a gain, but only one of them contributes actively by completing a real-effort task. In three treatments, decision power to divide the gain is assigned (1) to the inactive, (2) jointly to the inactive and the active, and (3) to the active. Results show that the impact of power goes beyond changing final allocations: it also significantly alters fairness perceptions. Decision power - in particular absolute power – mediates and significantly enhances self-serving biases. Results complement studies on the psychology of fairness perceptions. Moreover, the paper discusses implications for organizational design.

Keywords: fairness, wages, experiments, power, self-serving bias, organizational design

JEL classification: C91, D33, D63

---

[*] Universität Mannheim, Sonderforschungsbereich 504.

[♣] Universitat Pompeu Fabra, Barcelona.

[♦] The authors thank Robin Hogarth, Nagore Iriberri, Rosemarie Nagel, Jordi Brandts, James Konow, Eric Sorensen as well as seminar participants at Universitat Pompeu Fabra, Universität Mannheim, Universität Konstanz and the ESA North American Meeting 2007 for their constructive comments. Financial support from the Deutsche Forschungsgemeinschaft, SFB 504, at the University of Mannheim, is gratefully acknowledged.

1 Introduction

How should economic gain be divided between the different actors that are involved in its generation? The division of economic gain from productive activity has been among the central and most controversial issues in economic history. Whereas modern economic theory focuses more on efficiency wages and on remuneration for risk-taking, controversy in the public debate often involves a demand for justice or fairness. Contemporary topics include minimum wage regulations, the limits to executive pay, or recent developments in returns to labor and capital. In an international context, "Fair Trade" aims to divide profit in a way that pays higher wages to workers in third-world countries. Overall, fairness in the division of economic gain seems desirable. But then, when is a division of economic gain fair?

Consider a situation in which two people freely agree to participate in a productive activity, but only one of them contributes actively by completing a non-trivial task while the other remains inactive. If the "Active" completes the task successfully, both receive a sure minimum compensation for their involvement, but an additional gain has to be divided. What is the fair share for the Active? Even in this simple setting, different kinds of reasoning may lead to different conclusions about what is fair (cf., Hoffman and Spitzer, 1985, Konow, 2003, Cappelen, Hole, Sorensen and Tungodden, 2007). As we will argue below, all possible divisions could in fact be justified as fair according to different theoretical fairness ideals. Since fairness perceptions tend to be biased toward self-interest (cf., Messik and Sentis, 1979, Babcock and Loewenstein, 1997), we also expect fairness judgments to differ between Actives and Inactives: Actives will consider as fair a higher wage for themselves than Inactives. But now, does the perception of fairness depend on who has the power to allocate the economic gain? For instance, would Inactives judge the same divisions as fair, regardless of whether they have the power to decide or not?

This paper employed such an experimental laboratory setting to investigate the impact of decision power on fairness in the division of economic gain. In three experimental conditions we assigned (1) absolute power to Inactives, (2) shared power to both Inactives and Actives, or

(3) absolute power to Actives. Our results revealed that power affected actual divisions: Actives ended up with higher wages when they had more power to decide about them. Much more surprisingly, power also changed fairness perceptions. In general, the more power a party was given, the higher was the share which was judged as fair for that party to receive. For instance, Inactives with decision power acknowledged a lower wage for the Actives as fair than when they had no power. In particular, absolute power - in contrast with shared power - significantly changed fairness judgments of the powerful party. In this manner, power seemed to mediate a large portion of a bias that is typically attributed to self-interest. Our results show that it is not only self-interest per se which biases the perception of fairness; it is especially the power to act in line with this self-interest.

On the one hand, our findings contribute to understanding the psychology behind fairness perceptions and the way people trade off fairness considerations with monetary self-interest. On the other hand, it may provide insights for policy makers. After all, decision power, e.g. about the division of gains within corporations, is a variable that is subject to organizational design. When fairness in the division of economic gain is desirable, it may be important to take into account that fairness perceptions are sensitive to power structures beyond the direct impact on divisions.

The following section 2 introduces the literature on fairness in the division of gains from productive activity. Section 3 describes in detail the experimental design, and section 4 presents the results from the three experimental treatments. Section 5 provides a discussion of implications for the psychology of fairness perceptions and for organizational design. Section 6 concludes.

2 The quest for fair divisions

Fairness in distributions has been dealt with across many disciplines. Konow (2003) provides an exhaustive overview of both the theoretical and the empirical contributions. In this

section, we point out the findings which appear most relevant for the context of fairness in the division of gain from productive activity.

Philosophical theories of fairness may offer guidance on what is a fair division of economic gain. However, a closer look at the multiplicity of – sometimes conflicting - theories reveals that philosophical analysis cannot provide a definite answer. For instance, theories of distributive justice consider the total economic gain and then propose a fair division. But then, a strict version of an egalitarian theory divides equally between the involved parties, while a meritocratic (i.e., desert-based) theory splits proportionally to the contributions. In our example, egalitarian theory would propose an equal split of the gain, and meritocratic considerations would suggest giving more – or even the entire additional gain - to the Active. Nozick (1974) takes a different approach, when he argues for the principle of "justice in transfer"**,** according to which all allocations resulting from freely chosen transfers are fair. Applying such a libertarian conception of fairness, transfers of wage for labor could be regarded as fair whenever certain conditions are met, most importantly the respect for all actors' freedom of choice. In our setting, both parties freely agree to participate for the sure minimum compensation and they accept the prevailing power structure. For example, when the Inactive has absolute power, libertarian reasoning could justify keeping the entire additional gain. After all, in this case the Active knew that the minimum compensation was all he was entitled to receive for sure. Clearly, such libertarian criteria are not sufficient for guaranteeing fairness according to distributive justice. It is noteworthy that in our simple example virtually any division is justifiable as fair by an appropriate standard, e.g. applying libertarian, egalitarian or meritocratic reasoning. This is likely to hold true also for many – typically more complicated - natural settings.

Alternatively, the question of fairness may be regarded as an empirical one. Lay intuitions about fair divisions have been studied across disciplines. While some studies set out to test specific theories (see e.g. Froehlich and Oppenheimer, 1992, for a test of the Rawlsian "difference principle"), others investigate more generally the extent to which folk conceptions reflect a consensus on certain principles. In an interview study, Alves and Rossi (1978) identify

considerations of need and merit as main determinants of fair earnings. In the economic literature, many empirical studies emphasize the importance of fairness considerations for judgments and for actual behavior (e.g., Kahneman, Knetsch and Thaler, 1986; Hoffman, McCabe and Smith, 1996, Camerer, 2003). Empirical economic studies on fairness in allocation decisions typically rely on controlled and simplified settings in laboratory environments. With regard to principles behind fairness, Hoffman and Spitzer (1985) summarize their results stating that people usually apply meritocratic reasoning, and that they use egalitarian norms when there is "no obvious morally relevant distinction" between the parties. The importance of merit for fairness is also emphasized in Konow (2000), who suggests a model in which people maximize their utility by trading off their personal gains and costly deviations from what they judge as the fair division. Cappelen et al (2007) use a similar parametric utility model to examine this trade-off. They show explicitly that people differ in the extent to which they combine a freely chosen investment level (i.e., an effort choice) and an exogenously given rate of return (e.g., due to talent) as determinants of what are fair shares of gains from joined production. Overall, the pluralism of fairness ideals in lay intuitions is a recurring theme for situations involving gain from productive activity – even in simplified laboratory settings. Moreover, as mentioned at the outset, under circumstances of "moral ambiguity", Babcock and Loewenstein (1997) summarize an impressive body of empirical evidence showing that people tend to rely on the fairness notion which favors what is in their self-interest. For situations that are characterized by conflict of interests, this psychological phenomenon may further inhibit consensus on what may be considered fair.

The results from the present work relate to the mentioned findings. In particular, fairness judgments in our experimental setting allowed conjectures for discriminating between fairness principles which people intuitively rely on. Also, our findings illustrated that participants traded off fairness considerations with monetary self-interest; they even admitted to have done so. As said, however, the novel and central aspect in this study was the impact of decision power. Clearly, power affects allocations, since parties with unconstrained power may even decide to

take as much as possible from jointly produced gains. In addition, however, our findings showed that the allocation of power can change fairness perceptions. While such an effect may have interesting implications, it has so far not found explicit mentioning in the literature.

3 Experimental design

In the experiment, two actors were involved in the generation of economic gain: an "Active" and an "Inactive" (they were labeled A1 and A2 – for the complete instructions see Appendix). Participants were randomly assigned their role and matched to build pairs of Active-Inactive. Only Actives completed a tedious real-effort task which consisted of counting letters in different parts of a text. Inactives had nothing special to do, but could relax, read (we provided newspapers), do homework, etc. Participants never found out who was their partner, but they could see that in the room there was a group of Actives who were busy counting and a group of Inactives who were typically reading the newspaper. Also, Inactives were shown the text with the counting exercise so that they could infer the difficulty of the task. Only in case of successful task completion within 20 minutes, an experimental gain of € 16 was generated. Of the € 16, both Active and Inactive received the same fixed amount of € 3 as a minimum compensation. The excess gain of € 10 had to be divided between the two actors. The change in design across the three treatments consisted in the assignment of decision power about how to divide the excess gain:

Treatment 1 - "Inactives decide" how to divide the € 10.

Treatment 2 - "Both decide" and have to agree how to divide the € 10.

Treatment 3 - "Actives decide" how to divide the € 10.

Upon knowing the exact procedure - including the assignment of decision rights - and knowing their personal role, each participant marked on a sheet of paper whether he or she agreed to stay in the experiment or preferred to leave with a show-up fee of € 2. Participants

who preferred to leave were substituted. This feature of the design made explicit the participant's free agreement to the experimental conditions.

In Treatment 2 – "Both decide", Active and Inactive determined the allocations jointly in a repeated simultaneous-offers bargaining procedure. If they agreed (i.e., their proposals coincided), then the division was implemented. If they disagreed, they were informed about the proposal of the other party and they were asked to make a new proposal. This procedure was repeated until they reached an agreement. We chose this bargaining procedure because it was easy to understand and gave participants equal power (e.g., no first-mover advantage, no informational asymmetry, etc.). Those pairs of participants who agreed quickly left the experiment earlier, but we assured that they could not infer who had been their counterpart.

Experimental measures. In all three treatments we observed the divisions of the € 10 excess gain. Throughout the paper, results will be reported in terms of the **payments** that were given to the Active. After the actual division was made, we asked participants the following question: "What do you think would be the fair division?" These **fairness judgments** will be reported in terms of "fair payment to the Active".[1] In a subsequent questionnaire, participants were asked to state **arguments** for giving money to the Active and for giving money to the Inactive. Arguments served as complementary data to get an insight into the reasoning behind allocation decisions and fairness judgments. Previous experimental work in economics usually infers fairness ideals from behavior, while psychological studies tend to rely on questionnaires. In the present study we combine both methods. One advantage of this method is that it allows to identify discrepancies between an individual's fairness ideal and his or her factual behavior.

Experimental frame. Treatment 1 – "Inactives decide" and Treatment 3 – "Actives decide" represent variants of the Dictator Game. The Dictator Game is widely recognized as an

[1] The question varied slightly depending on the role and the treatment. It was phrased "Independently [of your decision how much to give / of what you think you will receive/ of the final division], what would be the fair division?". Note that in Treatments 1 and 3 the party with absolute decision power answered the question after having made the decision, while the other party was asked before receiving information about the actual payment. It would be interesting to see whether dividers would judge fairness differently when asked prior to the payment decision and whether this would change behavior.

"interesting vehicle for studying the meaning and interpretation of fairness" (Hoffman et al., 1996). However, it has been criticized for not representing a genuine social situation, in particular that money comes as "manna from heaven" (see e.g., Bardsley, 2005). Here, the game was embedded into a particular experimental frame in which economic gain was generated by productive activity. Productive activity in economic experimentation has been operationalized differently. For instance, whereas participants in Konow (2000) prepare letters for mailing, Capellen et al (2007) mimic production by a monetary investment decision. In the present study, Actives had 20 minutes to count correctly the frequencies of the letter M in different parts of a text.

Note that risk in this experimental setting was symmetric and that efficiency considerations did not play a role. Of course, these aspects play important roles for the division of gains from production in natural environments. However, the purpose of the present design was to provide a simplified benchmark of a genuine labor context, hence the focus on active vs. inactive involvement.

Recruiting and computerization. The experiment was computerized with z-tree software (Fischbacher, 1999) and conducted in the experimental laboratory (LEEX) at Pompeu Fabra University. Participants were 168 students from various fields of study who were recruited using the ORSEE online recruitment system (Greiner, 2004). They participated in nine sessions (16 to 20 participants per session) between October 2006 and May 2007.

4 Results

Two of 168 participants decided to leave the experiment after learning the rules and their personal role; one Inactive in Treatment 2 and one Inactive in Treatment 3. They were substituted.

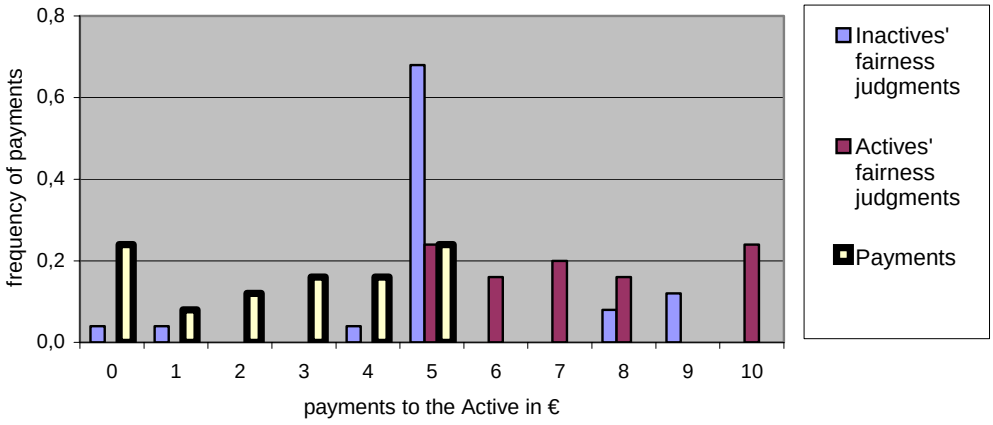
80 of 83 Actives managed to generate the gain by completing the task in 20 minutes.

Treatment 1 – "Inactives decide" (N = 2 x 25)

Payments. Frequencies of payments to the Active are depicted in Figure 1. The distribution of payments ranged from € 0 to € 5, with two modes at € 0 and at the equal split of € 5 (6 out of 25, respectively). The mean was € 2.6.

Fairness judgments. Fairness judgments for Inactives and Actives are also shown in Figure 1. The majority of Inactives (17 of 25) stated that the equal split is fair. The mean judgment of Inactives was € 5.3. 18 of 25 Inactives (72%) admitted that their payment to the Active was less than what would have been fair. Actives' judgments were more evenly distributed between € 5 and € 10, their mean judgment was € 7.2. The difference in the distributions is statistically significant (Mann Whitney rank test - MWR: $p < .01$).

Figure 1 -- Relative frequencies of payments to the Active and of fairness judgments in Treatment 1 - "Inactives decide"



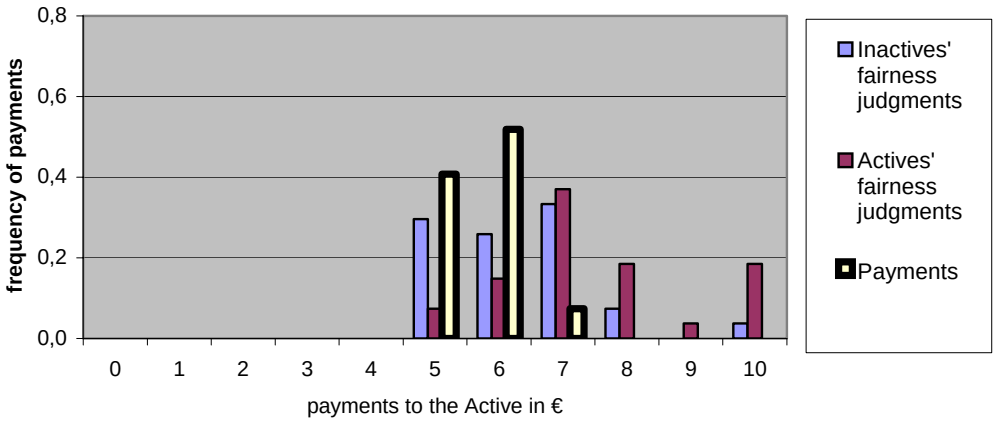
Treatment 2 – "Both decide" (N = 2 x 27)

Payments. The distribution of payments to the Active ranged from € 5 to € 7 (see Figure 2). The modal payment was € 6 (14 of 27) and the mean payment was € 5.7.

Fairness judgments. Fairness judgments by Inactives and Actives are also shown in Figure 2. The modal fairness judgment of both Inactives and Actives was € 7. While many Inactives

judged € 5, € 6, or € 7 as fair, many Actives stated € 7, € 8, or € 10 as the fair payment. Means were at € 6.3 for Inactives and at € 7.5 for Actives; this difference is statistically significant (MWR: $p < .01$).

Figure 2 -- Relative frequencies of payments to the Active and of fairness judgments in Treatment 2 - "Both decide"



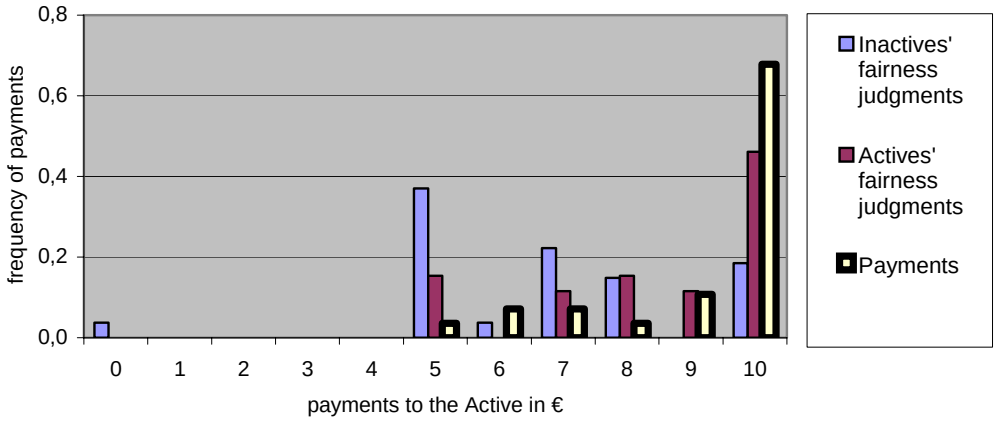
Bargaining procedure. The number of bargaining periods until an agreement was reached ranged from 2 periods (lasting approximately 1 minute) to 66 (approximately 20 minutes) with a median of 5 (approximately three minutes). Mean proposals of Inactives in the first bargaining period were 3.5, those of Actives were 7.9. Hence, the average difference between first proposals and final divisions (5.7) were similar for Inactives and Actives (2.15 vs. 2.26; difference not significant). It is interesting to note that on average both roles' first proposals are more self-interested compared to what they consider fair, but that this is considerably more so for Inactives (compared to their fairness judgment, Inactives proposed on average 2.8 less to the Active; Actives proposed only .4 more). Apparently the (symmetric) power structure is already reflected in first proposals, pulling allocations away from more meritocratic to more egalitarian outcomes.

Treatment 3 – "Actives decide" (N = 2 x 28)

Payments. The distribution of payments to the Active ranged from € 5 to € 10 (see Figure 3). The modal payment was € 10 (19 out of 28) and the mean payment was € 9.1.

Fairness judgments. Fairness judgments for Inactives and Actives are also shown in Figure 3. The modal judgment of Inactives was the equal split; their mean judgment € 6.7. The modal judgment of Actives was € 10; their mean judgment € 8.5. 42% of Actives admitted that they gave less than what would have been fair. The difference in the distributions is statistically significant ($p < .01$, MWR).[2]

Figure 3 -- Relative frequencies of payments to the Active and of fairness judgments in Treatment 3 - "Actives decide"



Payments and fairness judgments across treatments

Table 2 summarizes mean payments and mean judgments in all three treatments. Inactives in Treatment 1 paid on average 2.6 to the Actives; Actives in Treatment 3 paid on average 9.1 to themselves. Mean payments to Actives from the agreed upon divisions in Treatment 2 were 5.7, which is close to the mean between the other two treatments.

[2] We lost fairness judgments from three participants in one session of Treatment 3 due to computer problems.

Average fairness judgments ranged from 5.3 (Inactives in Treatment 1) to 8.5 (Actives in Treatment 3). Apart from individual differences, average fairness judgments revealed considerable variation depending on the role, i.e., whether participants were Inactives or Actives, but also for the same role depending on the experimental treatment. Table 2 reports results of the Mann-Whitney rank test on the differences between the respective distributions (p-values in parentheses between the means).

Table 2 -- Mean payments to the Active (row 1) and mean judgments (rows 2 and 3) in all treatments

	Treatment 1 – "Inactives decide" (25 pairs)		Treatment 2 – "Both decide" (28 pairs)		Treatment 3 - "Actives decide" (27 pairs)
Actual payments to the Active	**2.6**	(p<.01)	**5.7**	(p<.01)	**9.1**
Inactives judge as fair payments	**5.3**	(p<.01)	**6.3**	(n.s.)	**6.7**
	(p<.01)		(p<.01)		(p < .01)
Actives judge as fair payments	**7.2**	(n.s.)	**7.5**	(p< .01)	**8.5**

- P-values in parentheses indicate whether the respective distributions of payments or of fairness judgment are statistically different according to the Mann-Whitney rank test (n.s. = not significant).
- P-values for tests between Treatments 1 and 3 are not reported; distributions are clearly distinct.

Distributions of fairness judgments between Inactives and Actives were significantly different in all three treatments ($p < .01$, MWR). Across treatments, the second row of table 2 reveals that Inactives' judgments of what was the fair share to Actives were lower the more decision power Inactives were assigned: 5.3 for absolute power, 6.3 for shared power, 6.7 for no power (correlation coefficient $\rho = -.28$, $N = 79$). Differences were statistically significant between full power and shared power ($p < .01$), but not between shared power and no power ($p = 514$). In particular, the share of Inactives that opted for the equal split as the fair outcome

decreased from 68% in the case of absolute power to 37% (shared power) and 30% (no power). For Actives, more decision power meant higher judgments of what was their fair share: 8.5 for absolute power, 7.5 for shared power, and 7.2 for no power ($\rho = .32$, $N = 78$). Again, differences were statistically significant between absolute power and shared power ($p = .03$), but not between shared power and no power ($p = .459$).

In order to compare across treatments ($T = 1,2,3$) the homogeneity in fairness perceptions between the two parties, we calculated for the K_T interacting pairs the difference between what the Active judged as fair and what the Inactive judged as fair.[3] On average, this difference was 2.80 in Treatment 1 ($K_1 = 25$), 2.00 in Treatment 2 ($K_2 = 25$), and 2.84 in Treatment 3 ($K_3 = 27$). According to the Mann-Whitney rank test, differences in Treatment 2 were significantly smaller than in both other treatments (T2 vs. T1: $p = .07$, one-tailed; T2 vs. T3: $p = .06$, one-tailed), whereas they were almost the same in Treatments 1 and 3. Hence, fairness judgments of Actives and Inactives were more homogeneous under shared power compared to the two conditions in which one party was assigned absolute power.

Last, it may be illuminating to attempt a quantification of the relation between fairness judgments and actual divisions across experimental treatments. For that purpose we calculated for all N_T participants within treatments $T = 1,2,3$ the (absolute) differences between what the participant actually got paid and what he or she judged as fair to receive. On average, the difference between judgment and payment was 3.64 in Treatment 1 ($N_1 = 50$), 1.44 in Treatment 2 ($N_2 = 54$), and 2.13 in Treatment 3 ($N_3 = 53$). According to the Mann-Whitney rank test, differences in Treatment 2 were significantly smaller compared to both Treatment 1 ($p < .01$, one-tailed) and to Treatment 3 ($p = .07$, one-tailed), and they were significantly smaller in Treatment 3 compared to Treatment 1 ($p < .01$, two-tailed). Hence, of the three treatments, outcomes differed most from what was perceived as fair when only inactive participants decided about the division of the additional gain. Divisions were closer to fairness perceptions when

[3] Differences are reported in absolute terms, typically the higher judgment was from the Active.

absolute decision power was in the hands of those who were active, and they were closest when decision power was shared by both parties that were involved.

Arguments to justify allocations

In the questionnaire following the allocation decision we asked participants to "please give [up to three] arguments in favor of allocating money to A1" (the Inactive) and to "please give [up to three] arguments in favor of allocating money to A2" (the Active). Reasons for allocation decisions served to gain an insight into the extent to which reasoning reflected different fairness notions.

We compared arguments and classified them into categories. The most frequent argument was based on "amount of work / effort / time spent" and thus reflected considerations of merit. Two types of arguments were supportive of an egalitarian division: "roles were determined by chance" and "both players are needed and are part of the team". These arguments were typically given to justify the allocation of money to the Inactive.

Table 3 reports the frequencies with which participants wrote down arguments from a particular category. For example, the two far left columns show the arguments which were given for allocating money to Actives in Treatment 1; the very left column presents the number of times that Actives gave the arguments, the second left column presents the number of times that Inactives did so.

The majority of participants stated the amount of work or effort as a reason for giving money to Actives. In addition, this argument was used by some to justify allocating money to Inactives. In these cases, participants usually stated that "A1 had to spend time in the experiment". In all three treatments, Inactives and Actives recognized this argument almost equally often as justification for giving to Actives (24 vs. 24; 27 vs. 27; 22 vs. 18), while it was used more often by Inactives as a justification for giving to Inactives (4 vs. 2; 13 vs. 9; 11 vs. 6). The second most frequent argument was that "roles were determined by chance", which typically served as a reason to allocate money to Inactives. In Treatment 1 and Treatment 3 "Egoism and

Table 3 -- Frequencies with which participants stated types of arguments

	Treatment 1 – "Inactive divides"				**Treatment 2 – "Both divide"**				**Treatment 3 – "Active divides"**			
Allocating money to (...)	Actives		Inactives		Actives		Inactives		Actives		Inactives	
was justified by (…) with an argument based on…	Actives	Inactives	Actives	Inactives	Actives	Inactives	Actives	Inactives	Actives	Inactives	Actives	Inactives
amount of work / effort / time spent	**24**	**24**	**2**	**4**	**27**	**27**	**9**	**13**	**22**	**18**	**6**	**11**
roles were determined by chance	0	0	**3**	**5**	0	0	**7**	**11**	1	1	**12**	**5**
egoism / maximization of gains	x	x	**12**	**10**	0	0	0	1	**5**	**6**	x	x
both are needed / team of two	0	0	0	1	1	1	**4**	**6**	0	0	**4**	**2**
having power / decision rights	x	x	0	3	0	1	**6**	**4**	0	0	x	x
solidarity / altruism	1	0	x	x	0	0	0	0	x	x	**1**	**7**
the other gains already € 3	x	x	0	0	2	1	0	0	4	0	x	x
other	0	0	3	3	0	1	0	1	0	1	0	0
Sum of all arguments	**25**	**24**	**20**	**26**	**30**	**31**	**26**	**36**	**32**	**26**	**23**	**25**

- Numbers are absolute frequencies
- x means "not applicable"

maximization of personal gain" was stated as a reason for the party with absolute power to keep money for themselves. It was stated twice as often, however, as an argument for Inactives to keep money in Treatment 1 than for Actives in Treatment 3 (12 and 10 vs. 5 and 6). Several people emphasized that the team consisted of two people, so that the Inactive should get part of the allocation. "Solidarity" was stated almost exclusively by Inactives in Treatment 3 as a reason to give money to them.

5 Discussion of implications

The psychology of fairness perceptions

Fairness judgments across all experimental treatments ranged almost exclusively between € 5 and € 10 to the Active. Arguments mostly referred to "amount of work / effort / time spent", and frequently to "roles determined by chance" and "both needed / team of two" . Hence, fairness judgments and arguments support a combination of meritocratic and egalitarian reasoning for participants' fairness intuitions. There is no explicit evidence for libertarian reasoning to support a very low wage to the Active. Hoffman and Spitzer (1985) argue that whenever the context suggests asymmetric attribution of entitlement, then meritocratic reasoning will be applied. Our results did not confirm this claim. Rather, we observed that within an identical context, people who contributed actively to the generation of economic gain judged fairness more in accordance to meritocracy, while those who did not contribute actively often judged the equal split as fair (see figures 2 to 4). Messick and Sentis (1979) also found such role-dependent application of fairness notions in survey statements about hypothetical labor scenarios. In their study, people who were said to have worked more on a joint task generally believed that they should earn more, while those who were said to have worked less often stated that both parties should be paid equally. As noted in the outset, such differences are in line with the so-called "self-serving bias" in fairness judgments (see Babcock and Loewenstein, 1997).

The most novel aspect of our study concerns the impact of decision power on fairness judgments. In general, Table 2 reveals that the assignment of more power to one party lead to higher judgments of what is fair for that party to receive: the more power was assigned to Actives, the higher was what both parties judged as a fair payment to the Active. Interestingly, for both parties the difference in fairness judgments was statistically significant between absolute power and shared power, but not between shared power and no power. When Inactives were assigned absolute power to decide they tended to make fairness judgments that were significantly lower (see mean judgments in Table 2; also in Treatment 1 68% judged € 5 as fair vs. 37% and 30% in the other two treatments). Actives, on the other hand, tended to emphasize merit in a significantly more pronounced manner when they were assigned absolute power to decide (see mean judgments in Table 2; also in Treatment 3, 46% judged € 10 as fair vs. 24% and 19% in the other two treatments).

The psychological literature provides two prominent explanations for our findings. First, psychologists usually think of self-serving biases in terms of cognitive dissonance reduction (Festinger, 1957). Here, conflicting desires to gain more money in the experiment and to adhere to fairness may have caused cognitive dissonance, which participants reduced by interpreting fairness in a way that was more in line with their monetary self-interest. One may conclude that it is not only self-interest but in particular the power to act in one's self-interest which mediates and enhances the need to reduce dissonance.

Secondly, even though differences between shared power and no power did not turn out statistically significant, the general direction of all differences may point towards a "just world effect" (Lerner and Miller, 1978). According to this effect, "individuals have a need to believe that they live in a world where people generally get what they deserve "(p.1030). In the present case, the powerful would deserve their power and the mere fact that they have power would justify an increase in what is fair for them to receive.

Organizational design

Fairness in the division of economic gain may be a desirable criterion for institutions with productive activity, e.g. business organizations. Decision power, on the other hand, is a design variable for organizational arrangements. In our three experimental treatments, decision power about the division of the excess gain was assigned differently, and results showed that decision power influenced the results in two ways. First, participants with decision power tended to deviate from fairness in favor of their monetary self-interest. While there were exceptions and many participants traded off self-interest and fairness concerns to some extent, it was still true that more power on average resulted in significantly higher payments to the powerful party (see first row in Table 2). Second, power generally shifted fairness judgments in the direction of the powerful party, and in particular it corrupted the judgments of parties with absolute power in favor of their self-interest. Consequently, when decision power was shared, discrepancies in fairness perceptions between the interacting parties were significantly smaller, and actual divisions were considerably closer to what participants judged as fair.

For institutions which aspire fairness in division of economic gain, these results suggest that all parties which are involved in the creation of economic wealth should be assigned decision power. This is so not only because it will result in more balanced outcomes, but also because the fairness perceptions of the different parties will be more homogeneous.

For instance, consider the case of executive compensation which was mentioned at the outset. Executives are active contributors compared to the typically inactive shareholders. Our results suggest that when executives have a lot of power and control in organizations, they are likely to take a large share of the economic gain for themselves at the cost of shareholders. Moreover, executives will judge it fair to do so. On the other hand, when owners of a company are inactive but have full power over the division of the economic gain, it can be expected that many pay less than a fair wage to the active contributors, namely executives and workers. Again, this will go along with a biased perception of fairness. One may suspect that such unfair

practices are a reason - or at least give additional impetus - to public demands for regulatory measures such as corporate governance and minimum wages or for "Fair Trade". Our results can be interpreted to support a more indirect measure to enhance distributive fairness: participative decision structures which give active representation and power to all parties who are involved in the generation of economic gain.

It is noteworthy that more equitable decision processes should also fare better with regards to so called "procedural fairness". There is empirical evidence that people have a preference for fair procedures in addition to their preferences over allocations (see e.g., Anand, 2001, Bolton, Brandts, and Ockenfels, 2005).

From a philosophical perspective, our findings relate to Rawls' (1985) discourse on "justice as fairness". Rawls recognizes that full consensus on metaphysical conceptions of justice is unlikely in a free society. Instead, he emphasizes the need to establish appropriate conditions which "situate free and equal persons fairly and must not allow some persons greater bargaining advantages than others (p.235)".[4] Whereas Rawls focuses primarily on the political realm, his analysis is initially meant to apply very generally to "a society's main political, social, and economic institutions (p.225)". Our experimental results suggest a conclusion very similar to his for the division of gain within economic institutions: When general consensus on the question of distributive justice is unlikely, the appropriate conditions, e.g., of shared power, may be the key to fairer and more acceptable outcomes.

6 Conclusions

We used an experimental laboratory setting to study divisions of economic gain from production, and to elicit judgments concerning what is a fair division. The experiment provided a simplified labour context in which only one of two participants worked actively on a task to generate the gain. Results showed that in their allocation decisions participants traded off

[4] The well-known "veil of ignorance" is a hypothetical ideal representation of such conditions.

fairness and monetary self-interest, and that many divided unfairly in their self-interest, even according to their own subjective judgments. Fairness perceptions reflected both meritocratic and egalitarian considerations. In contrast, participants did not seem to intuit libertarian reasoning.

The most novel aspect of this study was its focus on the impact of decision power, which we assigned differently across three experimental treatments. First, power shifted the divisions, i.e., the more decision power was assigned to the active participant the higher was his share of the gain. More surprisingly, power shifted the perceptions of fairness. The more decision power was assigned to the active participant, the higher was the share that was considered fair for him to receive. In particular, absolute power for one party compared to the case of shared power significantly biased the fairness perceptions of the powerful party in a self-serving direction. Consequently, while fairness judgments across all treatments were characterized by a significant self-serving bias, the discrepancy in fairness perceptions was significantly less pronounced when power was shared.

These findings are interesting from a psychological perspective, but they may also have important implications for policy making. Our results suggest that participative decision structures in organizations can enhance fairness in the division of economic gain. Moreover, since fairness perceptions tend to be more homogeneous in systems of shared power, the effect on perceived fairness goes beyond the impact of power on actual divisions.

We emphasize that while fairness may be desirable for many reasons, it is only one among different criteria for the design of corporate structures. Efficiency considerations, for example, have been excluded in this study by construction of the experimental design, i.e. a fixed gain for task completion. Also, it is important to note that our experiment does not deal with the question how risk associated with different inputs is fairly compensated. It may be fruitful to adapt our experimental benchmark setting for addressing such issues in further research.

Bibliography

Alves, W., Rossi, P., 1978. Who Should Get What? Fairness Judgments of the Distribution of Earnings. **American Journal of Sociology** 84 (3), 541-564.

Anand, P., 2001. Procedural fairness in economic and social choice: Evidence from a survey of voters. **Journal of Economic Psychology** 22 (2), 247-270.

Babcock, L., Loewenstein, G., 1997. Explaining Bargaining Impasse: The Role of Self-Serving Biases. **Journal of Economic Perspectives** 11 (1), 109-126.

Bardsley, N., 2005. Altruism or Artefact? A Note on Dictator Game Giving. CeDEx, Nottingham School of Economics. Discussion paper.

Bolton, G, Brandts, J., Ockenfels, A., 2005. Fair procedures: Evidence from games involving lotteries. **The Economic Journal** 115 (1), 1054-1076.

Camerer, C., 2003. Behavioral Game Theory. Princeton University Press. Princeton, NJ.

Cappelen, A., Hole, A., Sorensen, E., Tungodden, B., 2007. The pluralism of fairness ideals: An experimental approach. **American Economic Review** 97 (3), 818-827.

Festinger, L., 1957. A Theory of Cognitive Dissonance. Stanford University Press. Stanford, California.

Fischbacher, U., 2007. z-Tree: Zurich Toolbox for Ready-made Economic experiments. **Experimental Economics** 10(2), 171-178.

Frohlich, N., Oppenheimer, J., 1992. Choosing Justice: An Experimental Approach to Ethical Theory. University of California Press. Berkeley and Los Angeles.

Greiner, B., 2003. An Online Recruitment System for Economic Experiments. In: Kurt Kremer, Volker Macho (Eds.): Forschung und wissenschaftliches Rechnen 2003. GWDG Bericht 63, Göttingen : Ges. für Wiss. Datenverarbeitung, 79-93, 2004.

Hoffman, E., McCabe, K., Smith, V., 1996. Social Distance and Other-Regarding Behavior in Dictator Games. **American Economic Review** 86 (3), 653-660.

Hoffman, E., Spitzer, M., 1985. Entitlements, Rights, and Fairness: An Experimental Examination of Subjects' Concepts of Distributive Justice. **Journal of Legal Studies** 14 (2), 259-297.

Kahneman, D., Knetsch, J., Thaler, R., 1986. Fairness as a Constraint on Profit Seeking: Entitlements in the Market. **American Economic Review** 76 (4), 728-741.

Konow, J., 2000. Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions. **American Economic Review** 90 (4), 1072-1091.

Konow, J., 2003. Which Is the Fairest One of All? A Positive Analysis of Justice Theories. **Journal of Economic Literature** 41 (4), 1188-1239.

Lerner, M., Miller, D., 1978. Just world research and the attribution process: Looking back and ahead. **Psychological Bulletin** 85 (5), 1030-1051.

Messik, D., Sentis, K., 1979. Fairness and preference. **Journal of Experimental Social Psychology** 15 (4). 418-434.

Nozick, R., 1974. Anarchy, State and Utopia. Basic Books. New York.

Rawls, J., 1985. Justice as Fairness: Political not Metaphysical. **Philosophy and Public Affairs** 14 (3), 223-251.

Appendix - Experimental instructions

(Differences between Treatments 1, 2 and 3 are indicated in italics.)

Instructions

Thank you for participating in this experiment which is part of a research project. You will have to make decisions. The money you can win depends on your decisions and on the decisions of the other participants. From now on please do not talk until the end of the experiments. Thank you very much!

You have aready gained € 2 for coming to the experiment. Now we tell you how the experiment works and how you can gain more money.

The experiment

Actors
The experiment consists of an interaction between **two actors: A1 and A2**. Each of you will be randomly assigned a role (A1 or A2). You will be matched randomly to build pairs "A1 – A2". You know that you will be assigned a counterpart of the other role, but you will never know who he/she is.

Payments
A2 has to do an exercise. If he/she completes the exercise successfully, a **total gain of € 16** is generated. From these € 16 both are paid €3 for sure. *The rest will be paid provisionally to A1. / The rest will be paid provisionally to A2. / A1 and A2 have to agree how to divide the rest (€ 10) between them.*

Actions

A2 has a maximum of 20 minutes to complete the exercise in order to generate the € 16. If A2 does not complete the exercise within 20 minutes the gain of € 16 will not be generated.

The exercise consists in several parts of a text. The entire exercise takes between 10 and 15 minutes if A2 works calmly but with full concentration. As said, A2 has a maximum of 20 minutes.
While A2 is working A1 has nothing special to do, but waits until A2 has finished. He/she can read (we have today's newspaper), relax, etc.
When A2 has finished the exercise, ***A1 decides how to divide the € 10*** *between him/herself and A2. / ...,* ***A2 decides how to divide the € 10*** *between him/herself and A1. / ...,* ***both decide about the division of the € 10*** *by making proposals simultaneously until they agree.*

Important: Participation by all actors is voluntary!
When you know your role and the rules you can decide whether you want to continue with the experiment (that you accept your role and the rules) or you can leave (with the € 2).

We repeat the process of the experiment

1) Distribution of the roles and decision whether to participate or not

It will be randomly decided how is A1 and A1. The distribution of the roles will be sequential so that it can take a few minutes until you have your role. When you are given your role, you have to decide if you want to continue with the experiment or leave. The distribution is finished when everyone has a role.
Remember that you have gained € 2 for sure for coming to the experiment. If you continue with the experiment and if A2 completes the exercise correctly then you receive at least € 3 more.

2) Exercise

A2 counts letters of a text. The information which letter to count will appear on the computer screen. The exercise will take approximately 15 minutes. All A2 have to complete the task before the experiment proceeds.
A1 can relax, read, etc.
If A2 completes the exercise in 20 minutes then a total gain of € 16 is generated.

3) Division

A1 divides the additional gain of € 10 between him/herself and A2. / A2 divides the additional gain of € 10 between him/herself and A1. / A1 and A2 divide the additional gain of € 10 between themselves.
That means *he/she / they* can decide between 11 different divisions:

1)	€ 10 for A1	€ 0 for A2
2)	€ 9 for A1	€ 1 for A2
...	...	...
10)	€ 1 for A1	€ 9 for A2
11)	€ 0 for A1	€ 10 for A2

If the proposals from A1 and A2 coincide, then the division is implemented. If the proposals do not coincide, A1 and A2 will have to make new proposals. That process is repeated until the proposals coincide. You will see the proposals of the other on the screen.

4) Questionnaire
5) Payments

Remember that the payments involve real money for the participants.
No one will know your results or your decisions in the experiment.
If you have a question please ask the experimenter at any time.
Thank you very much for your participation!

Nr.	Author	Title
07-75	Jannis Bischof Jens Wüstemann	How Does Fair Value Measurement under IAS 39 Affect Disclosure Choices of European Banks?
07-74	Markus Glaser Philipp Schäfers Martin Weber	Managerial Optimism and Corporate Investment: Is the CEO Alone Responsible for the Relation?
07-73	Jannis Bischof Michael Ebert	IAS 39 and Biases in the Risk Perception of Financial Instruments
07-72	Susanne Abele Garold Stasser	Continuous and Step-level Pay-off Functions in Public Good Games: A Conceptual Analysis
07-71	Julian Rode Marc Le Menestrel	The role of power for distributive fairness
07-70	Markus Glaser Martin Weber	Why inexperienced investors do not learn: They do not know their past portfolio performance
07-69	Jose Apesteguia Steffen Huck Jörg Oechssler Simon Weidenholzer	Imitation and the Evolution of Walrasian Behavior: Theoretically Fragile but Behaviorally Robust
07-68	Damian S. Damianov Jörg Oechssler Johannes Gerd Becker	Uniform vs. Discriminatory Auctions with Variable Supply - Experimental Evidence
07-67	Dirk Simons Barbara E. Weißenberger	Die Konvergenz von externem und internem Rechnungswesen ñKritische Faktoren für die Entwicklung einer partiell integrierten Rechnungslegung aus theoretischer Sichtñ
07-66	Alexander Ludwig Alexander Zimper	Attitude polarization
07-65	Alexander Ludwig Alexander Zimper	A Parsimonious Model of Subjective Life Expectancy
07-64	Michael F. Meffert Thomas Gschwend	Voting for Coalitions? The Role of Coalition Preferences and Expectations in Voting Behavior

Nr.	Author	Title
07-63	Michael F. Meffert Thomas Gschwend	Polls, Coalition Signals, and Strategic Voting: An Experimental Investigation of Perceptions and Effects
07-62	Peter Dürsch Maros Servátka	Risky Punishment and Reward in the Prisoner
07-61	Wendelin Schnedler Radovan Vadovic	Legitimacy of Control
07-60	Volker Stocké	Strength, Sources, and Temporal Development of Primary Effects of Families' Social Status on Secondary School Choice
07-59	Christopher Koch Martin Weber Jens Wüstemann	Can Auditors Be Independent? - Experimental Evidence
07-58	Sylvain Béal	PERCEPTRON VERSUS AUTOMATON&8727;
07-57	Sylvain Béal Jacques Durieu Philippe Solal	Farsighted Coalitional Stability in TU-games
07-56	Alen Nosic Martin Weber	Determinants of Risk Taking Behavior: The role of Risk Attitudes, Risk Perceptions and Beliefs
07-55	Michael F. Meffert Thomas Gschwend	Strategic Voting under Proportional Representation and Coalition Governments: A Simulation and Laboratory Experiment
07-54	Klaus Fiedler	Pseudocontingencies - A key paradigm for understanding adaptive cognition
07-53	Florian Kutzner Peter Freytag Tobias Vogel Klaus Fiedler	Base-rate neglect based on base-rates in experience-based contingency learning
07-52	Klaus Fiedler Yaakov Kareev	Implications and Ramifications of a Sample-Size Approach to Intuition

Nr.	Author	Title
07-51	Klaus Fiedler	The Ultimate Sampling Dilemma in Experience-Based Decision Making
07-50	Jürgen Eichberger David Kelsey	Ambiguity
07-49	Tri Vi Dang	Information Acquisition in Double Auctions
07-48	Clemens Kroneberg	Wertrationalität und das Modell der Frame-Selektion
07-47	Dirk Simons Nicole Zein	Audit market segmentation and audit quality
07-46	Sina Borgsen Martin Weber	False Consensus and the Role of Ambiguity in Predictions of Othersí Risky Preferences
07-45	Martin Weber Frank Welfens	An Individual Level Analysis of the Disposition Effect: Empirical and Experimental Evidence
07-44	Martin Weber Frank Welfens	The Repurchase Behavior of Individual Investors: An Experimental Investigation
07-43	Manel Baucells Martin Weber Frank Welfens	Reference Point Formation Over Time: A Weighting Function Approach
07-42	Martin Weber Frank Welfens	How do Markets React to Fundamental Shocks? An Experimental Analysis on Underreaction and Momentum
07-41	Ernst Maug Ingolf Dittmann	Lower Salaries and No Options: The Optimal Structure of Executive Pay
07-40	Ernst Maug Ingolf Dittmann Christoph Schneider	Bankers and the Performance of German Firms
07-39	Michael Ebert Nicole Zein	Wertorientierte Vergütung des Aufsichtsrats - Auswirkungen auf den Unternehmenswert