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On the Malleability of Fairness Ideals: Order Effects in Partial and Impartial Allocation Tasks*

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Abstract

How malleable are people's fairness ideals? Although fairness is an oft-invoked concept in allocation situations, it is still unclear whether and to what extent people's allocations reflect their fairness ideals. We investigate in a laboratory experiment whether people's fairness ideals vary with respect to changes in the order in which they undertake two allocation tasks. Participants first generate resources in a real-effort task and then distribute them. In the partial allocation task, the participant determines the earnings for himself and another participant. In the impartial allocation task, the participant determines the earnings for two other participants. We also manipulate the participants' experience, i.e., whether they took part in similar allocation experiments before. We find that participants are more likely to allocate more resources to themselves than what they earned in the real-effort task when they decide partially. Exclusively for inexperienced participants, deciding impartially first dampens selfish behavior when they decide partially.

Keywords: fairness, proportionality principle, dictator, partial stakeholders, impartial spectators, fairness bias.

JEL-codes: C72, C91, D63, D64

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1. Introduction

People care about fairness but they also care about their own interests. In some instances, tensions can arise between the pursuit of what is thought to be fair and what could benefit oneself. When such tensions arise, how one defines what is fair can become ambiguous, even malleable.

In this paper we investigate in the laboratory the malleability of fairness ideals in two allocation tasks that differ in whether participants have a stake in the outcome of their decision. In particular, we vary the order in which participants undertake these two allocation tasks and also their prior experience in allocation experiments in the laboratory.

Adam Smith (1759) introduced the idea that a fair allocation can be characterized by an impartial spectator who has no personal stake in the outcome. In circumstances where one has a personal stake in the outcome of an allocation, the pursuit of one's self-interest can run against one's stated fairness ideals. Defining a fair allocation may be problematic and people may appeal to different definitions of fairness depending on the material consequences of adhering to them. Instead of simply acting according to their self-interest, people attempt to reconcile norms of fairness with the temptation to act selfishly so they need not alter their perception of themselves as fair (see Rustichini and Villeval, 2014). That is, people care about seeing themselves as fair.¹ Indeed underlying Adam Smith's impartial spectator theory is people's concern about their self-image.²

We extend this line of research on self-image by exploring whether people try to maintain consistency between their expressed fairness ideals as impartial spectators and in their allocation decisions as partial stakeholders. To do so, participants in our experiment first generate some resources in a real-effort task. Then, they are confronted with two allocation tasks over the amount of resources generated by a pair of participants having full knowledge of how much each subject contributed to the total amount of resources to be allocated. In the *Partial Stakeholder* allocation task, each determines the earnings for himself and another participant. In the *Impartial Spectator* allocation task, each subject determines the earnings for two other participants. We manipulate

¹Fairness and self-image awareness and manipulation are identified by ethnographers as “human universals”, i.e., “features of culture, society, language, behavior, and psyche for which there are no known exceptions”(Brown, 1991).

²As Adam Smith writes, “We endeavour to examine our own conduct as we imagine any other fair and impartial spectator would examine it. If, upon placing ourselves in his situation, we thoroughly enter into all the passions and motives which influenced it, we approve of it, by sympathy with the approbation of this supposed equitable judge. If otherwise, we enter into his disapprobation, and condemn it.”

1. Introduction

the sequence of allocation tasks and study systematic differences in the two allocation tasks depending on the sequence—Partial-Impartial or Impartial-Partial—encountered. Specifically, in the Impartial-Partial sequence of choice we assess to what extent people try to adjust their actions in the partial stakeholder allocation task to fit their decisions in the impartial spectator allocation task. Conversely, in the Partial-Impartial sequence, we verify if people try to justify their action by adjusting their decision for others *ex-post*.

The real-effort task induces participants to feel entitled over the share of resources they produced and it makes an idea of fairness based on the *proportionality principle* salient. The proportionality principle defines fairness based on the idea that people’s entitlement should depend on factors within their control (e.g. effort) and should not be affected by factors outside their control (e.g. luck) (see Homans, 1958; Rotter, 1966). In our experiment, the proportionality principle would prescribe that each participant gets an allocation equal to the share of earnings they generated in the real effort task. In the partial stakeholder allocation task, participants decide as dictators and face a conflict between self-interest (i.e. allocating more resources to themselves than what they are entitled to) and fairness based on the proportionality principle.

In addition to manipulating the sequence of the two allocation tasks, we also vary participants’ previous experience in other dictator game and dictator game-like experiments in the same laboratory. Levin et al. (1988) note that experience in the laboratory helps participants to focus on the relevant factors in the experiment (e.g. payoff maximization) and less attention to peripheral factors (for example, the order of the decision task).

Using the ideal observer theory and proportionality principle to test fairness may constrain the kind of fairness principles we can test in subjects’ allocation decisions. However, it serves two important functions in light of our research question: it provides an experimentally verifiable measure of fairness and self-interest and it allows us to connect our work with previous experimental studies of fairness in the laboratory using the dictator game. Our experimental design builds upon that of Konow (2000), which employed a double dictator game treatment. In this treatment, participants first played a standard dictator game wherein they allocate resources between themselves and another participant. They then played another version of the dictator game wherein they allocated resources between two other participants apart from themselves. We extend this design by varying the order of the decision task. Results in Konow (2000) show that dictators who give more to themselves than what they earned in the real-effort task take more than what they believe is fair. Moreover, they believe that it is fair to take more than the fair amount.

2. Literature Review

We find that the proportionality principle is a widely acknowledged fairness principle when participants choose as impartial spectators. However, when acting as partial stakeholders, participants tend to claim a larger share of the output for themselves than what is “deserved.” This is particularly true for participants who contributed relatively less to the sum of earnings to be distributed, and so face a stronger conflict between the pursuit of self-interest and the application of the proportionality principle. Violations of the proportionality principle are milder among individuals who have no experience in experiments relative to those who have already taken part in similar experiments. This is possibly due to spillovers in choices, with decisions in the impartial spectator task affecting decisions made as partial stakeholders.

The paper proceeds as follows. Section 2 discusses the relevant literature; Section 3 describes in detail the experiment design and section 4 presents the hypotheses. Section 5 presents and discusses the results of the experiment while section 6 concludes.

2. Literature Review

Previous studies analyzing the behaviour of people in allocation situations have used the dictator game wherein a participant in the role of a dictator splits resources between herself and another player who can only accept the division. Camerer (2003) found that the average amount shared is over 20 % which goes against the theoretical prediction that a rational, purely self-interested player should keep the whole endowment to himself. The prevalence of fair splits hints at the possibility that people follow some fairness principle in their allocation (Ostrom, 2000) that could be motivated by inequity aversion (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000) or social welfare concerns (Charness and Rabin, 2002; Engelmann and Strobel, 2004).

However, several studies have highlighted how dictator game allocations are heavily dependent on contextual and individual factors (see Engel, 2011). For example, Hoffman et al. (1996) found that increasing social isolation leads to lower offers. When a dictator is making an offer not to another person but to a charity, Eckel and Grossman (1996) find that there is a significant increase in offers. On the other hand, Cherry et al. (2002) show that when dictators distribute over earned wealth than endowments and when they have complete anonymity, positive offers are essentially eliminated. And when given the opportunity to obscure the relationship between their allocation decisions and final outcomes, dictators also behaved less generously (see Dana et al., 2007; Becker, 2013).

We contribute to this line of research on dictator games by looking at how past partic-

3. *Experimental Design*

ipation in allocation experiments affects offers in the dictator game. Moreover, we also implement two versions of the dictator game like what Konow (2000) did and additionally vary the order in which participants played these two versions.

The evidence so far on dictator games depicts a range of complex motivations behind people's allocation decisions beside pure self-interest and pure altruism. Individuals care about fairness, but they also care about their social image, displaying a preference for being perceived as fair by others (see Andreoni and Bernheim, 2009). Moreover, they also care about their self-image and perceiving themselves as fair. For example, von Hippel and Trivers (2011) find that individuals do not just adjust their actions to their principles but also try to convince themselves that serving their own interests do not violate their principles. Such efforts to maintain positive beliefs about oneself are in line with what Bénabou and Tirole (2011) identify as self-signaling, i.e., attempts to influence the beliefs and actions of a future self by the present self. What distinguishes our study and what our experiment emphasizes is that instead of a statement of fairness principles that is imposed from the outside, fairness principles come from participants' own decisions.³ In this regard, our study provides a sharper focus on the role of self-image than previous studies on fairness in allocation situations.

Finally, our study also relates to the discussion on the role of participants' experience in their behavior in the laboratory. Although the discussion on possible methodological issues arising from participants' previous laboratory experience is still in its nascent stage, recent work on this topic reveals it to be an aspect that is worthy of further investigation. In particular, Matthey and Regner (2013) find that participation in previous allocation experiments like dictator or ultimatum games increases the amount participants assign to themselves. Given this, prior experience in allocation experiments in the laboratory is one the factors we manipulated in our experiment.

3. Experimental Design

In this section we present our experimental design and discuss the treatments implemented. Participants in the experiment did four tasks: a real-effort task, two allocation tasks and a guessing task. The treatments we varied between-subjects are as follows: i) the order of the two allocation tasks and ii) whether participants have previously taken

³On a related note, Barden et al. (2005) test in a series of experiments how reversing the order of giving a public statement and performing a private behavior changes how a participant perceives someone else as hypocritical in areas such as safe sex and healthy living. While our study also uses a similar order manipulation, we focus on possible changes in personal decisions and not in the perceptions participants have of other people.

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part in at least one allocation experiment in the laboratory. At the end of the experiment, participants in all treatments answered a guessing task based on a vignette.

Real effort task (RE). The real-effort task consisted of counting zeros in a series of 5x5 tables for 5 minutes. Participants faced one table at the time on their computer screen (an example is shown in Figure 1 of the Appendix). If they correctly counted the number of zeros in the table, they received 1 experimental currency unit (ECU) and a new table was generated. In case of a mistake, they had a maximum of three attempts to provide a correct answer, otherwise no ECU was earned for that table and a new table was automatically generated.⁴ The purpose of the real-effort task was to create an amount of resources that measures the individual effort exerted and which gives participants an entitlement to the resources in the allocation task. In fact, before the start of the real-effort task, all participants already knew that the amount of resources generated in the first stage were the resources to be divided in the subsequent allocation task. We also gave them details about the first allocation procedure before the real-effort task. We adopted the counting zeros task because it offers a reasonably clean measure of individual effort (a factor likely to be within the participants' control) and makes an idea of fairness based on the proportionality principle salient.

The partial stakeholder allocation task (P).

This task proceeded like a standard dictator game. Participants in this allocation task decided how to allocate the total amount of ECUs earned in the real effort task by themselves and by another participant, while knowing the contribution of each to the total amount to be allocated. Therefore, they faced a trade-off between applying the proportionality principle—that would prescribe an allocation which reflects the inputs given by each subject—and acting on their self-interest—that would dictate allocating to themselves more than they actually contributed.

The impartial spectator allocation task (I). Participants in this allocation task decided how to distribute the total amount of ECUs earned in the real-effort task by two other participants. Each participant is a dictator for two other participants and her decision for those two others did not affect her own earnings. As the impartial spectator, she received the earnings she obtained in the real-effort task. In this task, participants can

⁴Participants had the chance to practice the task for two rounds. We made clear in the instructions that the performance in the practice rounds had no bearing on subsequent rounds or in the final payment.

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apply the proportionality principle without any conflict with their self-interest.

The guessing task. At the end of the experiment, we presented a vignette describing a situation similar to the one encountered in the two allocation tasks previously described. A total amount of 100 ECUs has to be allocated between Player 1 and Player 2 who contributed 40 and 60 ECUs, respectively. We asked participants to guess how socially appropriate the majority of participants would consider 11 different allocations. A 4-point scale with the following values was used: “Socially very unacceptable”, “Socially quite unacceptable”, “Socially quite acceptable”, “Socially acceptable”. The 11 potential allocations was obtained by starting from an allocation of 0 to Player 1 and of 100 to Player 2 and increasing (decreasing) in steps of 10 the allocation to Player 1 (Player 2). This vignette study aimed to elicit social norms about the application of the proportionality principle using a methodology similar to Krupka and Weber (2013). The only difference was that the same participants who are responsible for the allocation tasks also have to guess the social appropriateness of the different allocation.⁵ Following the procedure in Krupka and Weber (2013), the computer randomly chose one of the potential allocations. If participants chose the same appropriateness for that allocation as the majority of all participants in that session they could earn additional money.

3.1. Treatments

The treatments in the experiment were implemented between-subjects and varied i) the order of the partial stakeholder and impartial spectator allocation tasks and ii) the experience of participants with the allocation task.

Order effect. Depending on the order in which the tasks are presented, we refer to two treatments: Partial-Impartial (PI) and Impartial-Partial (IP). We presented the experiment to participants in two parts. In the first part, participants, regardless of the treatment, did the real-effort task. In treatment PI, they then proceeded with the partial allocation task. After the first part of the experiment is concluded, we informed participants of the details of the impartial allocation task and then participants made their allocation. In treatment IP, we reversed the order of the two allocation tasks. Participants first decided as impartial spectators and then as partial stakeholders.

Experience with the allocation task. The second treatment variation depended on

⁵In contrast, Krupka and Weber (2013) had one group of participants answer the guessing exercise and another set of participants perform the actual allocation task

3. Experimental Design

whether or not participants previously participated in at least one dictator or ultimatum game experiment, according to the information stored in the ORSEE database of the laboratory where the experiment was conducted. In this treatment variation, we invited two different groups of participants to the lab: the experienced group (Exp) and the inexperienced group (Inexp). We administered the experiment to the groups in separate sessions (between-subject design). In both treatments, we followed the procedures commonly used in the laboratory and did not inform invited students of the type of experiment they were going to perform and of the previous laboratory experience of the others.

Table 1 summarizes our four treatment variations.

Treatment	Order of Allocation Tasks			Experience
	stage 1	Part 1 stage 2	Part 2	
IP-exp	Real Effort	Impartial Spectator	Partial Stakeholder	Experienced
IP-inexp	Real Effort	Impartial Spectator	Partial Stakeholder	Inexperienced
PI-exp	Real Effort	Partial Stakeholder	Impartial Spectator	Experienced
PI-inexp	Real Effort	Partial Stakeholder	Impartial Spectator	Inexperienced

Table 1: Treatments, by Role and Experience

3.2. Experimental Procedures

We programmed the experiment using z-Tree Fischbacher (2007) and we conducted 2 sessions of each treatment at the experimental laboratory of the Max Planck Institute of Economics (Jena, Germany), from July to September 2013. As displayed in Table 2, a total of 180 participants participated in the four treatments, with 21 or 24 individuals taking part in each session. In all treatments, participants were students from the Friedrich Schiller University in Jena, recruited via the ORSEE software Greiner (2004). Upon arrival at the laboratory, each participant was randomly assigned to one visually isolated computer terminal. It was common knowledge that the experiment was composed of two parts. First, each participant received written instructions for the first part of the game. We read the instructions aloud for the first part and participants answered a set of control questions on the screen to check if they understood the instructions correctly. After the completion of part one, we distributed and read aloud instructions

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on the second part of the experiment.⁶ Each session lasted about 50 minutes and the average payment was 12.85 Euros (min 2.5, max 28.6), including a show-up fee of 2.5 Euros and the earnings obtained in the vignette study. The conversion rate of ECUs to Euros was 1 ECU = Euros 0.30.

	PI	IP	PI+IP
Inexp	42	42	84
Exp	48	48	96
Inexp + Exp	90	90	180

Table 2: Number of Participants Per Treatment

In the Partial Stakeholder allocation task all participants decided as dictator. While deciding, participants knew that the subject for whom they made an allocation for would not be the same one who chose the allocation for them (i.e., participant A is the dictator for participant B who is the dictator for participant C).

In the Impartial Spectator allocation task, all participants made a decision and were simultaneously part of a pair for whom another impartial spectator would made a decision for. Participants are informed that, the participants for whom they made an allocation as impartial spectator would not be the same one who chose (as impartial spectator) for them (i.e., participant A is the impartial spectator for participant D and E; participant F is impartial spectator for participants A and G).

In both allocation tasks, all decisions were anonymous and no participant ever learned with whom they have been paired with in each decision. Moreover, we made clear to participants that all pairs formed during the experiment were perfectly independent from one another. Thus, participants never interacted with the same person twice in both decision tasks. We employed this matching procedure to avoid further confounding strategic considerations in participants' allocation decisions.

We informed participants that to determine the experimental earnings, a random draw at the end of the experiment determined which of the two experimental parts was going to be relevant for the payment. Since all participants decided both as partial stakeholder and impartial spectator, a second random draw determined whether a participant's allocation decision was going to be implemented.

Assume that the decision as partial stakeholder was drawn. Now, if a participant was randomly selected (1/2 probability), then her P allocation was relevant for determining her earnings. If the participant was not randomly selected (1/2 probability), then

⁶All instructions were in German; an English translation can be found in Appendix A.

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her earnings for the P allocation task would be determined by the choice of another participant (different from the one to whom her choice in the first case would apply).

Assume now that the decision as impartial spectator was drawn. If a participant was randomly selected (1/3 probability) her I-allocation was relevant for the earnings of a pair of participants and she would have earned the amount of ECUs obtained in the real effort task. If she was not randomly selected (2/3 probability), then her earnings would have been determined by the I-allocation of another participant (who was neither of the two participants to whom her choice in the first case could have applied).

4. Hypotheses

Our experimental design allows us to test three main hypotheses all related to the proportionality principle. Our first hypothesis deals with violations of the proportionality principle depending on the presence of a conflict between self-interest and fairness in the allocation task. Our second hypothesis pertains to the impact of order of the decision tasks on the likelihood that participants follow the proportionality principle while our third hypothesis is about the impact of previous laboratory experience on allocation decisions.

Hypothesis 1. *When deciding as partial stakeholders, participants will more likely violate the proportionality principle and allocate more to themselves than what they earned in the real-effort task compared to allocations when deciding as impartial spectators.*

The first hypothesis is based on results from previous studies on dictator games showing that participants tend to give more to themselves than what they earned, especially if such decisions have personal pay-off consequences and are made anonymously and privately (see Cherry et al., 2002). In our experiment, the allocation made as partial stakeholder is also made privately and anonymously, giving our participants more leeway to behave more selfishly. In contrast, the allocation made as an impartial spectator the absence of consequences on the deciders' payoff can serve as a cue for participants to view the situation in an "abstract moral setting" (Rustichini and Villeval, 2014) and can thus prompt them to follow more closely the proportionality principle.

Hypothesis 2. *When choosing as partial stakeholders, more violations of the proportionality principle will be observed in the PI treatment than in the IP treatment.*

The second hypothesis takes into account the possible role of self-image. In the IP treatment, when participants first decide as impartial stakeholder without knowing they will also have to decide as partial stakeholder in the second part of the experiment, they can build a rather fair image of themselves following the proportionality principle since

5. Results

this does not affect their payoffs. However, this ties their decision as partial stakeholder in the next decision task as they cannot easily disregard the image they have built for themselves as an impartial stakeholder following Bénabou and Tirole (2011). Although deciding partially gives them room to behave more selfishly, this can be countered by the desire to maintain the positive self-image they have built previously. This may result in more fair offers. Conversely, in the PI treatment, deciding partially first allows participant to behave more selfishly. In a surprise subsequent task wherein they decide as an impartial stakeholder, their previous allocation as a partial stakeholder may serve as a guide to what is “fair” in efforts to convince themselves that their past and presumably selfish action also constitutes fair behavior. Thus, they can impose an allocation as impartial spectators that favors one party over another in violation of the proportionality principle.

Hypothesis 3. *When choosing as partial stakeholders, participants with former laboratory experience are more likely to violate the proportionality principle.*

This hypothesis is based on several studies showing that experience in the laboratory makes participants more attuned to relevant factors in the experiment (e.g. their payoffs), then we expect more selfish allocations made among experienced participants compared to the inexperienced ones, (Matthey and Regner, 2013). On this basis, we expect experienced participants to behave more selfishly to maximize their payoff, regardless if they decide partially or impartially first.⁷

5. Results

In this section we present our results. After an overview of the data (subsection 5.1) we first analyze the fairness ideals of our participants focusing on the results of the I-allocation task (section 5.2) and then we present results of the P-allocation task (section 5.3). Finally we discuss our findings and the results from the guessing task in the vignette study.

5.1. Summary Statistics

Table 3 presents an overview of the data displaying, for each of the four treatments, the average performance in the real effort task (panel a); a percentage measure of devia-

⁷The role of participants’ experience in the laboratory is not yet well-explored in economic experiments. In a public good game, Conte et al. (2014) find that experienced participants on average both contribute less and expect others to contribute less.

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tion from a perfect application of the proportionality principle both in the I-allocation task (panel b) and in the P-allocation task (panel c). Results of comparisons between treatments based on a set of two-sample Mann-Whitney tests (MW, henceforth) are also reported.

Consider panel a) which reports the performance in the real effort in each treatment. Since participants got a piece rate of 1 ECU for each table solved correctly, in our experiment earnings and performance in the real effort task coincide. From the table it can be noted that on average 34.5 tables were correctly solved by participants in the experiment. No significant difference in the number of tables counted is observed between the PI and PI treatments (MW test: $z = 0.855$, $p = 0.393$). However, experienced participants counted on average 4 tables more than the inexperienced ones (MW test: $z = 3.119$, $p = 0.002$). As can be noted, results are similar when we focus on the single treatment variations: differences are not significant when comparing the IP and PI treatments if we consider only the inexperienced participants or the experienced ones. Experienced participants perform better than the inexperienced both when considering only the PI treatment or only the IP treatment. Therefore, we can conclude that order of allocation tasks in the second stage of the first part of the experiment did not significantly affect the effort exertion in the real effort task while participants' experience has an impact on the performance, suggesting that experienced participants might also be more familiar with the laboratory setting.

Consider now panel b). It refers to the I-allocation task and it indicates the variation from a perfect application of the proportionality principle measured as percentage of extra reward (ER_I , henceforth). This measure is obtained as the difference between the percentage of the total earnings of the pair assigned by the partial stakeholder to person i in the pair, and the percentage of the earnings of the pair generated by person i . When the impartial spectator perfectly applies the proportionality principle, this percentage measure takes value equal to zero. If the proportionality principle is violated in favor of participant i in the pair (or in favor of the other subject in the pair, e.g. participant j) it takes positive (negative) values.

It can be noted how values reported in panel b) are very close to zero for each of the four treatments, suggesting that in the I-allocation task the impartial allocator is likely to allocate earnings of the pair in a way which closely reflects their contribution to the total earnings. While we do not observe significant differences when comparing IP and PI treatments (MW test: $z = 0.304$, $p = 0.713$), we observe that the measurement for the experienced participants is slightly bigger than for the inexperienced ones (MW test: $z = 1.653$, $p = 0.098$).

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Consider now panel c): it refers to the P-allocation task and it indicates the percentage of extra rewards (ER_P , henceforth) kept by the partial stakeholder compared to the one she generated in the real effort task. When the partial stakeholder perfectly applies the proportionality principle, then $ER_P = 0\%$. When the proportionality principle is violated in favor of the partial stakeholder (or in favor of the other subject in the pair) it takes positive (negative) values.

Inspection of panel c) reveals that the averages of ER_P are well above zero in all treatments, suggesting that partial stakeholders, on average, tend to assign to themselves more than what they are entitled to. On average they take an $ER_P = 19.34\%$ of the entire earnings produced by the pair, with no significant differences across the IP and PI treatments (MW test: $z = 0.326$, $p = 0.745$) but with a tendency of experienced participants to assign more to themselves (MW: $z = 2.597$, $p = 0.009$), especially in the IP treatment.

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Panel a): Earnings/Performance in the Real Effort Task

	PI	IP	PI+IP	MW test PI vs IP
Inexp	32.75 (8.47)	32.75 (6.25)	32.75 (7.39)	z=0.036 p=0.971
Exp	36.94 (7.43)	35.17 (7.59)	36.05 (7.52)	z=0.994 p=0.320
Inexp + Exp	34.98 (8.16)	34.03 (7.06)	34.51 (7.62)	z=0.326 p=0.745
MW test Inexp vs Exp	z=2.535 p=0.011	z=1.754 p=0.079	z=2.597 p=0.009	- -

Panel b): I-allocation Task: % of ER_I

	PI	IP	PI+IP	MW test PI vs IP
Inexp	0.83 (11.39)	0.42 (9.94)	0.63 10.63	z=0.097 p=0.923
Exp	-1.16 (12.97)	0.60 (8.63)	-0.28 (11.12)	z=0.735 p=0.462
Inexp + Exp	-0.23 (12.23)	0.52 (9.37)	0.14 (10.87)	z=0.304 p=0.713
MW test Inexp vs Exp	z=0.793 p=0.428	z=1.745 p=0.081	z=1.653 p=0.098	- -

Panel c): P-allocation Task: % of ER_P

	PI	IP	PI+IP	MW test PI vs IP
Inexp	16.23 (19.82)	12.38 (19.33)	14.311 (19.56)	z=0.997 p=0.319
Exp	20.44 (20.33)	27.04 (23.01)	23.74 (21.85)	z=1.386 p=0.166
Inexp +Exp	18.48 (20.09)	20.20 (22.49)	19.34 (21.28)	z=0.326 p=0.745
MW test Inexp vs Exp	z=0.817 p=0.414	z=2.839 p=0.005	z=2.547 p=0.009	- -

Note. In panel b) the % of ER_P = (% of the total earnings kept by the partial stakeholder – % of the total earnings generated). In panel b) the % of ER_I = (% of the total earnings assigned to i – % of the total earnings generated by i).

Table 3: Average Earnings from the Real-Effort Task, P- and I- Allocations, Standard Deviation in Parenthesis

5. Results

A first analysis of the data suggests that participants tend to violate the proportionality principle when deciding as partial stakeholders, while they are more likely to apply it when deciding as impartial spectators. Moreover, experienced participants seem to behave differently from inexperienced ones. In the next sections we present a more systematic analyses of these differences.

5.2. Fairness Principles

We obtain initial insights about fairness principles based on proportionality from the I-allocation task. If our experimental design succeeded in making a fairness principle based on proportionality salient, we expect that in the I-allocation tasks, where there is no conflict between self-interest and fairness principles, impartial spectators will allocate resources reflecting each member's contribution. Figure 1 displays the relation between the amount allocated to the better performer in the group by the impartial spectator and the amount contributed by the better performer in the group in the PI (left panels) and IP (right panels) treatments and for the experienced (bottom panels) and inexperienced participants (top panels). When these two amounts coincide then the proportionality principle is perfectly applied. In the figure this case is represented by the points on the 45 degrees line. Average amounts contributed and received are reported along the x- and y-axis, respectively.

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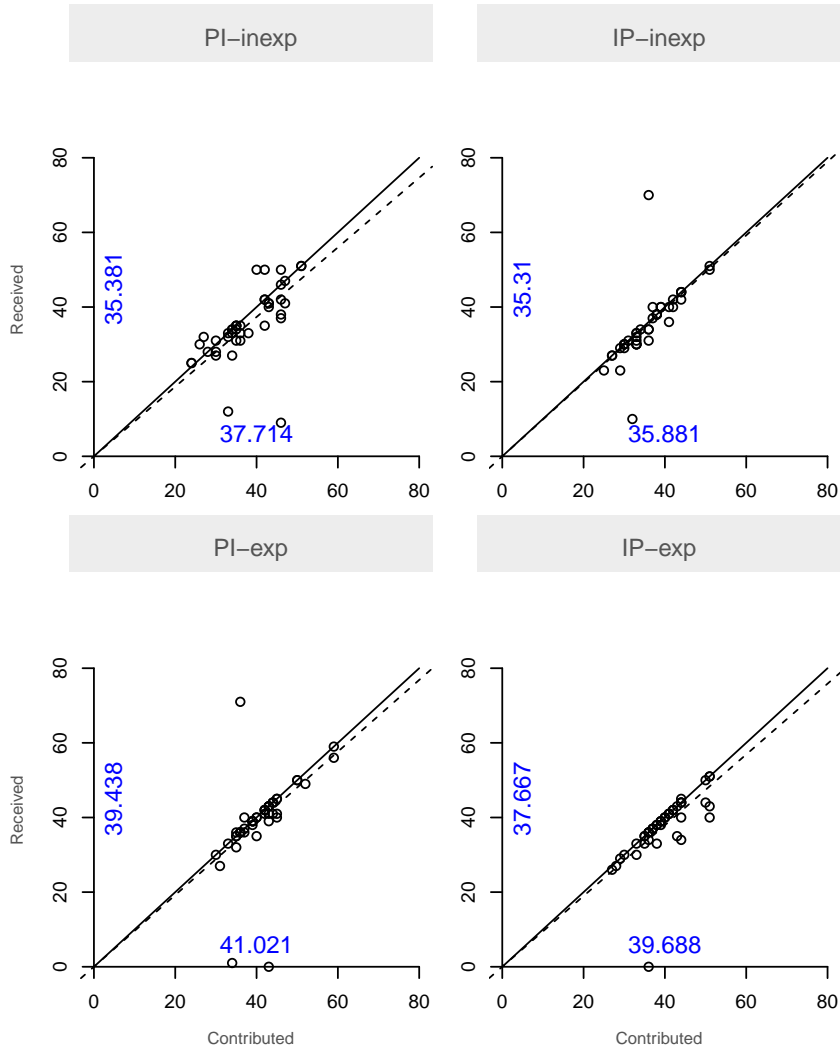


Figure 1: Allocations to Better Performer by Impartial Spectators

As shown in Figure 1, allocations to the better performer are quite close to the equity line even though they tend to be slightly below the line, regardless of the absolute level of the performance. This is confirmed also by a linear fitting of the data (dashed line). We observe no substantial differences across levels of experience and treatments. Overall, impartial spectators in both treatments tend to choose so as to preserve proportionality.

In table 4 we report the average ER_I assigned to the better performer in the pair in each treatment. Comparisons across treatments based on a set of MW tests (also reported in the table) show that differences across treatments are not statistically sig-

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nificant, suggesting that, irrespective of the order of the allocation task and of previous experience, participants agree on how resources should be allocated when their material interests are not affected by the choice.

	PI	IP	PI+IP	MW test PI vs IP
Inexp	-2.21 (9.48)	-0.18 (14.53)	-1.31 (11.87)	z=0.350 p=0.726
Exp	-3.24 (10.23)	-2.61 (3.50)	-2.95 (7.77)	z=1.203 p=0.229
Inexp + Exp	-2.72 (9.77)	-1.45 (10.26)	-2.15 (9.96)	z=0.398 p=0.691
MW Test: Inexp vs. Exp	z=0.054 p=0.957	z=1.376 p=0.169	z=0.819 p=0.413	- -

Note. The % of ER_I = % of the total earnings assigned to i – % of the total earnings generated by i , where i is the member of the pair obtaining highest earnings in the real-effort task.

Table 4: I-allocation Task: % of ER_I Assigned to the Better Performer in the Pair, Standard Deviation in Parenthesis

For each treatment we also test if the average % of ER_I assigned to the better performer in the pair is significantly different from zero, where zero indicates that the proportionality principle is perfectly applied. According to a set of Wilcoxon signed-rank tests we find that % of ER_I is not significantly different from zero for the inexperienced participants irrespective of the order of the allocation task. This result holds if we do the tests overall and for each of the order treatment (overall, inexperienced: $z = 1.508$, $p = 0.1317$; in the IP treatment, inexperienced: $z = 1.008$, $p = 0.313$; and in the PI treatment, PI-inexp: $z = 1.131$, $p = 0.258$). The ER_I made by the experienced participants, despite being low in magnitude, are always significantly different from zero (overall, experienced: $z = 3.931$, $p = 0.000$; in the PI treatment, experienced: $z = 2.380$, $p = 0.017$; and in the IP treatment, experienced: $z = 3.115$, $p = 0.002$). Thus, experienced impartial spectators tend to slightly favor the worse performer in the pair applying a fairness principle based on equality rather than on proportionality. The order of allocation tasks does not significantly affect this tendency.⁸

⁸When looking at the order of the allocation tasks, irrespective of experience, we do find that average % of ER_I is always significantly different from zero (PI: $z = 2.308$, $p = 0.021$; IP: $z = 2.881$, $p = 0.004$)

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Evidence collected in the impartial spectator decision task suggests that, when personal stakes are not affected, participants perceive proportionality as a relevant fairness ideal even though they allow for a small violation of strict proportionality to pursue equality.

5.3. Partial Stakeholders

In this section we focus on the decision of partial stakeholders. Figure 2 provides a representation of the allocation choices in each treatment. The graph illustrates the relation between amount contributed by the partial stakeholder and amount allocated to herself (regardless of being the better performer in the group), in treatment *PI* and *IP* respectively. In the figure, choices of the experienced (exp) and inexperienced (inexp) are kept separate. The solid line identifies allocations that match proportionality between contributions and amount obtained (equity line). Average amounts contributed and received are reported along the x- and y-axis, respectively.

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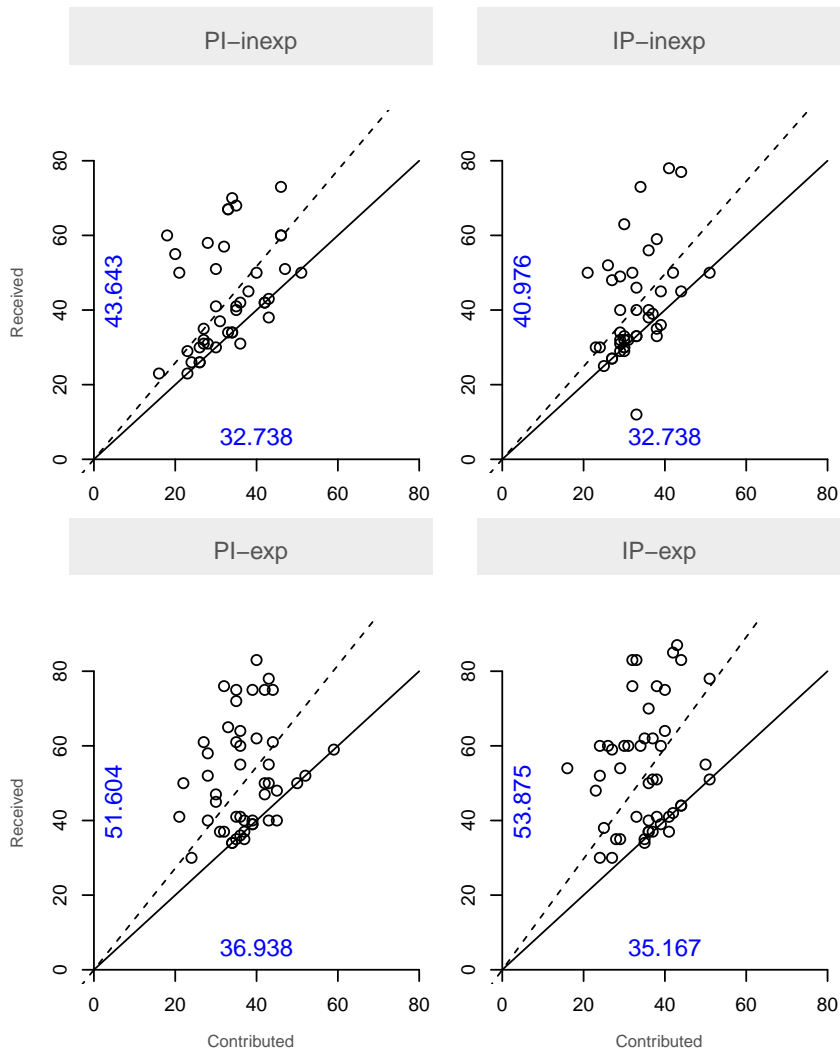


Figure 2: Allocations to Self by Partial Stakeholders

Figure 2 shows that decisions of the partial stakeholders are biased and largely tend to favor themselves over their counterpart. In both treatments and for both levels of experience, most of the observations are well above the equity line, with participants allocating more to themselves than what they contributed to the group. This is confirmed by a linear fitting of the data (dashed line) showing that on average partial stakeholders claim more resources for themselves than what they contributed in the real effort task. Inexperienced participants are overall closer to proportionality than experienced participants, as shown also by average values. The largest difference in average amount appropriated when comparing behavior of the two groups is in the IP treatment.

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When we look at our measure of extra rewards, the average (median) ER_P for the partial stakeholder is 20.20 % (11.29 %) and 18.48 % (9.84 %) for experienced and inexperienced participants in treatment IP and PI and equal to 23.74 % (19.90 %) and 14.31 % (6.96 %) for experienced and inexperienced participants, respectively. Non-parametric tests show that the distributions of ER_P reported in Table 3 for each treatment are statistically different from zero (Wilcoxon Signed Rank Test, IP-experienced: $z = 5.610$, $p = 0.000$; IP-inexperienced $z = 4.023$, $p = 0.000$; PI-experienced: $z = 5.335$, $p = 0.000$; PI-inexperienced $z = 4.753$, $p = 0.000$).

As reported in the last column of Table 3, comparison of the PI and IP treatments shows that they do not significantly differ.⁹

In Table 5 we analyze whether partial spectators behaved differently depending on the fact that they were performing relatively better than the other member in the pair or not. To do so, we divide our partial stakeholders into two categories: the ‘better performers’ (indicating participants who obtained the higher earnings in the real effort task within the pair) and the ‘worse performers’ (indicating participants who obtained the lower earnings in the real effort task within the pair). An application of the proportionality principle in the P-allocation task prescribes that the higher amount of resources be assigned to the better performer. So, worse performers face a stronger tension between the application of the proportionality principle and serving their own interest by allocating more to themselves than what they actually earned.

Table 5 reports the average % of ER_P kept by partial stakeholders in each treatment depending on whether they were the better or the worse performer in the pair. Panel a) refers to the experienced participants while panel b) to the inexperienced ones. Inspection of the two panels reveals that both in the IP and PI treatments and in both the experienced and inexperienced groups, worse performers keep for themselves a significantly higher percentage of ER_P compared to the better performers. These differences are significant and also big in magnitude: worse performers in the experienced group keep for themselves twice as much as the better performers. The amount kept by worse performers in the inexperienced group is three times as much as the one kept by better performers.

The order in which the allocation tasks are presented has no significant impact. How-

⁹In Section 5.2, we show that the proportionality between inputs and outputs is perceived as a prominent social norm. It is interesting to note here that the perceived social norm correlates to the size of ER asked by partial spectators. Specifically, participants reporting that the allocation preserving proportionality (40–60) is “Socially Unacceptable” tend to claim more extra rewards (mean=66.9) than those who report that the same allocation is “Socially Acceptable” (mean=41.1) (Wilcoxon Rank Sum Test, $p = 0.059$)

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ever, in the IP treatment, experience has a further impact on the amount kept: experienced participants allocate to themselves significantly more than inexperienced, regardless of their performance in the pair.

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Panel a) P-allocation task, Experienced Participants: % of ER_P kept				
	PI	IP	PI+IP	MW test PI vs IP
Better Performer	13.06 (18.00)	18.26 (19.51)	15.77 (18.78)	$z=0.921$ $p=0.357$
Worse Performer	26.68 (20.40)	35.83 (23.23)	31.07 (22.07)	$z=1.497$ $p=0.135$
MW Test: Better vs Worse	$z=2.515$ $p=0.012$	$z=2.893$ $p=0.004$	$z=3.731$ $p=0.000$	- -
Panel b) P-allocation task, Inexperienced Participants: % of ER_P kept				
	PI	IP	PI+IP	MW test PI vs IP
Better Performer	5.53 (11.45)	6.83 (18.98)	6.25 (15.88)	$z=0.097$ $p=0.923$
Worse Performer	22.82 (21.15)	17.44 (18.64)	20.35 (20.01)	$z=0.933$ $p=0.351$
MW Test: Better vs Worse	$z=3.071$ $p=0.002$	$z=2.375$ $p=0.018$	$z=3.930$ $p=0.000$	- -
Panel c) MW test Exp vs Inexp				
	PI	IP	PI+IP	
Better Performer	$z=1.141$ $p=0.204$	$z=1.897$ $p=0.058$	$z=2.198$ $p=0.023$	
Worse Performer	$z=0.650$ $p=0.515$	$z=2.576$ $p=0.010$	$z=2.295$ $p=0.022$	
Note. The % of ER_P = % of the total earnings kept – % of the total earnings generated. The better (worse) performer identifies the participant who, within a pair, obtained the higher (lower) earnings in the real effort task.				

Table 5: P-allocation Task: % of ER_P Kept by the Partial Stakeholder, Standard Deviation in Parenthesis

We conducted a linear regression analysis to deepen our understanding of the allocation decisions made as partial stakeholder and as impartial spectator. Table 6 reports

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the outcome of a model estimation in which the dependent variable is given by extra rewards (ER_P) claimed for themselves by partial stakeholders (see above how we compute this measure). As explanatory variables we take into account: treatment dummy IP , being equal to 1 when participants first face the impartial spectator task and then the partial stakeholder task and being equal to 0 when the order of the tasks is reversed; dummy variable *Inexperienced* being equal to 1 if the participant had not participated in other dictator game experiments before and equal to 0 otherwise; *Own.Performance* captures the level of own performance in the contribution task; *Diff.Perform* is a measure of relative performance capturing the difference between the performance of the partial stakeholder and of the partner.

	Model 1	Model 2
	% of ER_P	% of ER_P
(Intercept)	32.209 (9.718)***	28.232 (10.010)***
IP	1.486 (2.930)	6.233 (4.165)
Inexperienced	-10.279 (3.041)***	-5.091 (4.084)
Own.Performance	-0.255 (0.258)	-0.211 (0.258)
Diff.Perform	-0.552 (0.174)***	-0.574 (0.171)***
$IP \times Inexperienced$		-10.083 (5.804)*
R ²	0.177	0.191
F (p-value)	<0.001	<0.001
Num. obs.	180	180

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, \cdot $p < 0.1$

Table 6: Ordinary Least Squares Regression on Extra Rewards Allocated as Partial Stakeholder

As the intercept of Model 1 in Table 6 shows, partial stakeholders take for themselves considerable positive extra rewards. The size of extra rewards is significantly lower among inexperienced than among experienced participants.

Regression outcomes of Model 2 shed some more light on the source of the difference among experienced and inexperienced participants. As the interaction term $IP \times Inexperienced$ shows, inexperienced participants react to the order of the allocation tasks. Specifically, inexperienced participants who are first exposed to the I-allocation task claim less extra rewards for themselves than those exposed to the P-allocation task first.

Our last analysis is based on the difference between the I- and P-allocations: $\Delta_{I-P} =$

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$\%ofER_I - \%ofER_P$, defined at the individual level. Figure 3 plots the distribution of this variable in each treatment while Table 7 contains information about the average measures depending on whether the participant was a better performer in the P-allocation task or not. From Figure 3 it can be noted that, in all treatments, the distributions are concentrated on the left with a mode of 0 for all treatments except in the IP-experienced treatment. This is in line with the fact that participants are less likely to apply proportionality in the P-allocation task compared to the I-allocation task.

Inspection of Table 7 reveals that the difference in extra rewards is significantly higher for worse performers compared to better performers, both for the experienced and the inexperienced participants. This difference however is not affected sequence of the allocation tasks. Some difference can be seen in the IP sequence, where the worse performers do not behave differently than the better performers, but only among the inexperienced participants.

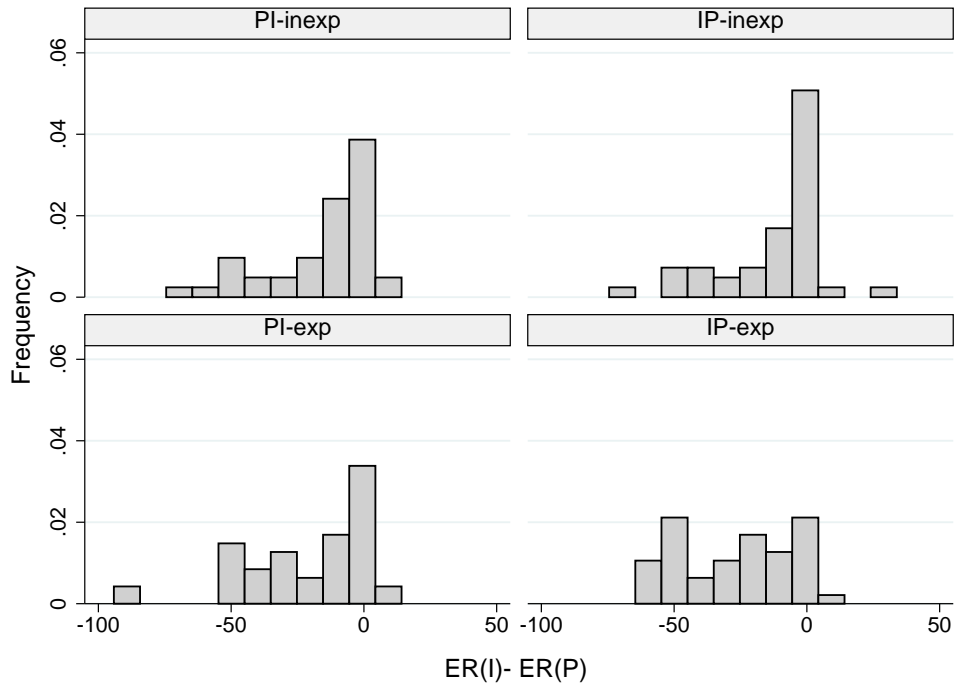


Figure 3: Difference between $\%ofER_I - \%ofER_P$

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Panel a) %ofER_I – %ofER_P, Experienced Participants				
	PI	IP	PI+IP	MW test PI vs IP
Better Performer	- 17.15 (28.82)	- 18.23 (18.10)	- 17.71 (23.57)	z=1.203 p=0.229
Worse Performer	- 25.36 (20.08)	- 34.65 (21.47)	- 29.82 (21.07)	z=1.574 p=0.116
MW test Better vs Worse	z=2.034 p=0.042	z=2.682 p=0.007	z=3.192 p=0.001	- -
Panel a) %ofER_I – %ofER_P, Inexperienced Participants				
	PI	IP	PI+IP	MW test PI vs IP
Better Performer	- 6.43 (13.42)	- 9.89 (22.44)	- 8.34 (18.80)	z=0.383 p=0.701
Worse Performer	- 20.92 (21.60)	- 13.85 (16.63)	- 17.68 (19.61)	z=0.994 p=0.320
MW test Better vs Worse	z = 2.153 p = 0.031	z=1.060 p=0.289	z=2.359 p=0.018	- -
Panel c) MW test Exp vs Inexp				
	PI	IP	PI+IP	
Better Performer	z=0.776 p=0.438	z=1.593 p=0.111	z=1.693 p=0.091	
Worse Performer	z=0.980 p=0.327	z=3.214 p=0.001	z=3.019 p=0.003	

Table 7: Difference between the I- and the P-allocation Tasks, Standard Deviation in Parenthesis

5.4. Discussion and Social Norm elicitation

Our results clearly support Hypothesis 1, suggesting that when their personal interest is not affected by the allocation, participants are likely to conform to an idea of fairness based on the proportionality principle. In contrast, when deciding as partial stake-

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holders, they are more likely to violate proportionality to their advantage, especially when they perform relatively worse than their counterpart, and consequently entitled to a smaller amount of resources.

We find no support for Hypothesis 2: the order in which the I- and P- allocation tasks are presented has basically no effect on the behavior of participants. However, Hypothesis 3 is fully supported in our data: experienced and inexperienced participants behave in a significantly different way. The order in which participants undertake the two allocation tasks affects the decisions of the inexperienced but not that of the experienced. That is, inexperienced participants first exposed to the impartial allocation task claim less extra rewards for themselves than those first exposed to the partial allocation task. On the other hand, we observe no difference between the decisions of experienced participants who were in the PI treatment and experienced participants in the IP treatment.

Finally, in order to define how participants value the proportionality principle we present the results of our vignette study conducted at the end of the experiment.

All participants were confronted with an allocation situation similar to the one encountered in the experimental tasks: a total amount of 100 ECUs had to be allocated between player 1 and 2 who contributed 40 and 60 ECUs, respectively. In our vignette study, we asked participants to evaluate the social appropriateness of 11 potential allocations obtained by starting from an allocation of 0 to Player 1 and of 100 to Player 2 and increasing (decreasing) in steps of 10.

For each allocation individuals had to guess the answer chosen by the majority of the participants on a 4-point scale with the following values: “Socially very unacceptable”, “Socially quite unacceptable”, “Socially quite acceptable”, “Socially very acceptable”. The aim of the task is therefore to guess the prevailing social norm in the reference population. Following Krupka and Weber (2013), we converted participants’ social norm ratings into numerical scores. A rating of ‘Socially Very Unacceptable’ received a score of -1, ‘Socially Quite Unacceptable’ a score of -1/3, ‘Socially Quite Acceptable’ a score of +1/3, and ‘Socially Very Acceptable’ a score of +1.¹⁰

¹⁰As the authors discuss, this particular scoring is intuitive (the least and most appropriate possible ratings receive scores of - 1 and +1, respectively) and simple (possible ratings are evenly spaced over the - 1 to +1 interval)

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Allocation	Mean (Std. Dev.)	-- (%)	- (%)	+(%)	++(%)	MW IP vs PI	MW Exp vs Inexp	MW Better vs Worse
0—100	-0.948 (0.268)	95.60	2.20	1.10	1.10	z=0.745 p=0.456	z=1.285 p=0.199	z=0.989 p=0.322
10—90	-0.878 (.327)	85.00	12.80	1.10	1.10	z=1.083 p=0.279	z=1.176 p=0.240	z=0.053 p=0.958
20—80	-0.578 (0.404)	42.20	53.30	3.30	1.10	z=0.459 p=0.646	z=1.738 p=0.082	z=0.402 p=0.688
30—70	-0.148 (0.399)	6.70	60.00	32.20	1.10	z=0.647 p=0.517	z=0.301 p=0.736	z=0.915 p=0.360
40—60	0.630 (0.418)	0.60	5.60	42.80	51.10	z=0.334 p=0.739	z=2.138 p=0.033	z=1.251 p=0.211
50—50	0.726 (0.433)	0.60	7.20	25.00	67.20	z=2.435 p=0.015	z=2.541 p=0.011	z=2.337 p=0.020
60—40	-0.093 (.0521)	13.30	42.80	38.30	5.60	z=0.373 p=0.709	z=3.014 p=0.003	z=2.280 p=0.023
70—30	-0.515 (0.502)	42.20	46.10	8.30	3.30	z=0.856 p=0.392	z=3.189 p=0.001	z=1.242 p=0.214
80—20	-0.752 (0.435)	69.40	26.70	1.10	2.80	z=0.820 p=0.412	z=1.735 p=0.083	z=1.778 p=0.078
90—10	-0.881 (0.406)	90.00	5.60	1.10	3.30	z=0.495 p=0.621	z=0.320 p=0.749	z=0.055 p=0.956
100—0	-0.907 (0.409)	95.00	0.00	1.10	3.90	z=0.311 p=0.756	z= 2.179 p=0.030	z=0.038 p=0.970

Table 8: Social Norms Questionnaire

Note. The first number in the allocation refers to Player 1 (who contributed 40) while the second number refers to Player 2 (who contributed 60). The allocation 40–60 identifies the perfect application of the proportionality principle. The bold font identifies the assessment that participants think will be given by the majority. Responses are ‘Socially Very Unacceptable’ (- -); ‘Socially Quite Unacceptable’ (-); ‘Socially Quite Acceptable’ (+); ‘Socially Very Acceptable’ (++) .

Table 8 presents participants’ social appropriateness ratings across all treatments: each row corresponds to one possible allocation of resources.

As shown in Table 8, which refers to data from the four treatments, most of the participants think that extreme allocations are perceived as socially unacceptable. The second column report the mean and standard deviation of the social appropriateness ratings (ranging from complete agreement on ‘very socially inappropriate’ (−1.0) to complete agreement on ‘very socially appropriate’ (1.0), and then the full distribution of responses. The final three columns report the results of a set of MW tests comparing the

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two distributions of responses depending on i) the order in which the I- and P- allocation tasks are presented (IP vs PI); ii) the experience of participants (Exp vs Inexp) and iii) the performance of the participant in the pair (Better vs Worse).

The general pattern of social appropriateness ratings shows that the vast majority of participants deems the allocation which exactly matches proportionality of inputs and rewards (i.e. 40—60) and the equal split allocation (i.e. 50—50) socially acceptable. We do not find any significant differences in the distribution of the ratings of each allocation depending on the order of the I- and P- allocation tasks, except for the 50—50 allocation, reflecting the application of a fairness ideal based on egalitarianism rather than proportionality. For this allocation, participants in the IP treatment judge an egalitarian allocation more socially appropriate than participants in the PI treatment (average: 0.785 vs 0.667, respectively). When controlling for the experience of participants, we find that this result is driven by inexperienced participants (average IP vs PI: 0.905 vs 0.730, respectively, MW test: $z = 2.504$, $p = 0.012$), while there are no significant differences across the IP and PI treatments for the experienced participants (average IP vs PI: 0.681 vs 0.611, respectively, MW test: $z = 1.144$, $p = 0.253$).

Other differences are found when conditioning on the experience of participants for the 40—60 allocation and for the allocations 50—50, 60—40 and 70—30, which violate the proportionality principle in favor of the worse performer.

Specifically, inexperienced participants expect others to value as more socially appropriate allocations in line with equality rather than proportionality: (*allocation 40-60*: average Exp vs Inexp: 0.681 vs 0.571; *allocation 50-50*: average Exp vs Inexp: 0.646 vs 0.817; *allocation 60-40*: average Exp vs Inexp: - 0.194 vs 0.123; *allocation 70—30*: average Exp vs Inexp: - 0.604 vs - 0.413).

Interestingly, the behavior in the P-allocation task seems in contrast with the elicited social norm: the experienced participants take on average more ERP compared to the inexperienced ones. In particular, the worse performers take for themselves the $ERP = 31.7\%$ corresponding to 75.34% of the total earnings generated, which strongly violates both the proportionality and the equality principle.

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In this paper we conducted an experiment to see whether and to what extent people’s allocation decisions reflect their fairness ideals according to the proportionality principle. We manipulated the order in which they undertake two allocation tasks and the previous laboratory experience of participants in allocation experiments. Participants first

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generate resources in a real-effort task and then distribute them. The partial allocation task proceeds like a standard dictator game wherein participants determine the earnings for themselves and another participant. In the impartial allocation task, the participant determines the earnings for two other participants.

Our first finding is in line with what has been previously discovered (see Konow, 2000): participants allocate more to themselves than what they have earned when choices have direct payoff consequences for themselves. Our second finding is that the sequence of roles as decision maker in the dictator game has an effect for inexperienced participants who have not yet participated in an allocation experiment in the laboratory before. Specifically, inexperienced participants are more likely to follow the proportionality principle as partial stakeholders when deciding impartially first.

Why should the sequence of partial and impartial roles in an allocation task matter? One conjecture is that people would like to have a rather fair, even generous, image of themselves. Deciding impartially first, wherein allocations entail no personal material cost, allows people to reveal what they think is the ideal allocation between two parties. When their allocation can have personal consequences, as in the partial stakeholder allocation task, people's self-interest can run against their fairness principles. When deciding partially first and acting selfishly, people justify their initial decision by giving a more unfair allocation as an impartial spectator in a subsequent allocation task. The reverse can happen when deciding impartially first. In line with the literature on self-image (see Bénabou and Tirole, 2011), the decision of the previous self (i.e., the decision in the first task) becomes a form of self-signal to the future self (i.e., how to decide in the second task).

The results of the experiment can also be interpreted in light of what we discover in the vignette study to elicit social norms about the proportionality principle. Participants when deciding as impartial spectators have a slight preference towards awarding a share slightly larger than what the worse performer in the real effort task contributed. Such distributional preference is also reflected in what participants deem as socially acceptable in the vignette study. More participants favored a 50—50 division than an allocation that exactly matched proportionality of inputs and rewards. It appears that a 50—50 division in the dictator game is the social norm among our participants. However, even though this might be the social norm, participants in our experiment rarely split the pie in the actual decision tasks this way. This is also what Krupka and Weber (2013) find in their own test of their elicitation technique. They further state that norm ratings alone do not simply track behavior independently. This is evidence in support of the idea that people can be aware of various fairness principles but allow themselves to choose which

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principles can serve their own interest.

However, we observe that order of decision matters only among participants who have not participated in allocation experiments before, suggesting that factors as laboratory experience and learning deserve further attention in the dictator game literature. Although dictator game giving has been considerably studied already, these experiments use findings from some individuals who have participated in experiments before. Our study shows that there may be a need to take into consideration the role of participants' experience in previous experiments when analyzing dictator game giving in particular and laboratory behavior in general.

We presented here an experiment to check how reversing the order in which participants undertake two allocation tasks that differ in their personal stake in the final outcome can alter their fairness principles. While using the proportionality principle and impartial spectator theory affords us with an experimentally verifiable measure of fairness in relation to self-image concerns, it also limits the definitions of fairness used by people that we can test. As hinted by the vignette study, people are aware of alternative definitions of fairness. If this research looks into how malleable people's fairness ideals are according to the proportionality principle, future research can also explore how people adjust their actions according to other definitions of fairness and vice-versa.

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These are instructions for the PI treatment. For the IP treatment, instructions for Stage 2 of Part A and Part B are switched.

Welcome! You are about to participate in an experiment funded by the Max Planck Institute of Economics. Please switch off your mobile and remain quiet. It is strictly forbidden to talk to the other participants. Whenever you have a question, please raise your hand and one of the experimenters will come to your aid. You will receive 2.50 Euros for showing up on time. Besides this, you can earn more. The show-up fee and any additional amounts of money you may earn will be paid to you in cash at the end of the experiment. Payments are carried out privately, i.e., the others will not see your earnings. During the experiment we shall speak of ECUs (Experimental Currency Unit) rather than Euros. The conversion rate between them is 1 ECUs = 0.3 Euro. This means that for each ECU you earn you will receive 0.3 Euro.

The experiment consists of two parts. The instructions for Part A follow on the next page. The instructions for Part B will be distributed after all participants have completed Part A. In each part we will explain to you how the earnings for that part are determined. At the end of the experiment the computer will select either Part A or Part B for payment by a random draw. If Part A is selected, you will receive only the earnings you obtained in Part A; if Part B is selected, you will receive only the earnings you obtained in Part B. Therefore, since you do not know which part will be randomly selected for your final payment, please think carefully about each decision in each part. The earnings obtained in the selected part will be converted into Euros and paid privately in cash. All instructions in both parts are identical for all participants and we read them aloud such that you can verify this. Please note that Part A and Part B of the experiment are completely separated and you will never encounter the same person in both parts.

DETAILED INSTRUCTION FOR PART A.

1. What is the situation you are facing in Part A?

Part A will consist of 2 stages which will be conducted as follows: In Stage 1 all participants are asked to perform individually a task which involves counting zeros on the computer screen. The task will be explained in detail below and it is identical for each participant. In Stage 2 you will be randomly paired with another participant in this room to form a pair. You will not be told who you are paired with either during or after the experiment. A variable amount of ECUs will be credited to an account which is assigned to each pair. This amount is dependent on the

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performance of the two participants in the pair in Stage 1. Each member of the pair will know his own performance and that of the other participant in the pair.

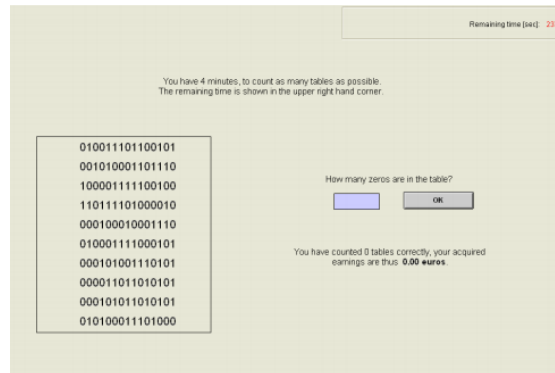
In treatment PI only. The ECUs credited to each pair's account will be distributed to that pair. However, a given member of the pair cannot be guaranteed any specific amount of ECUs, since the final allocation of the ECUs between the two participants in the pair will depend only on the decision of one of the two participants in the pair, chosen randomly to make the distribution. The details and the manner of this distribution will be provided after Stage 1 is explained below.

In treatment IP only. The ECUs credited to each pair's account will be distributed to that pair. However, a given member of the pair cannot be guaranteed any specific amount of ECUs, since the final allocation of the ECUs between the two participants in the pair will depend only on your decision. The details and the manner of this distribution will be provided after Stage 1 is explained below.

2. Detailed information about Stage 1 of PART A.

In Stage 1 your task is to correctly count zeros in a series of tables in a 5 minutes. The figure below shows an example of the work screen you will encounter:

Figure 4: A sample of the work screen



Each screen contains a table. For each table you have to enter the correct number of zeros into the box on the right side of the screen.

After you have entered the number, click the OK-button.

- If you enter the correct result you get 1 ECUs.
- If your input was wrong, then you can try again two more times;
- If you do not submit any correct input in any of the three rounds you get 0 ECUs and proceed to the next table.

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Then a new table is generated, and so on for a total of 5 minutes. At the end of Stage 1, your performance will be determined by the number of tables that you solved correctly within the 5 minutes. The more tables you solved correctly the higher your earnings. Before you start, each of you will face two practice rounds, which will not be relevant for the determination of your earnings. The practice rounds will be followed by the paying rounds with money prizes. In each round you will encounter a new randomly generated table. Stage 1 will last 5 minutes and it will start after the practice rounds. Are there any questions?

2.1. Information at the end of Stage 1

At the end of this stage, we will determine your earnings depending on the number of tables that you solved correctly within the 5 minutes and you will be informed about your earning (i.e. the number of ECUs obtained). This is true for all participants.

3. Detailed information about Stage 2 of PART A

In Stage 2 you will be randomly paired with another participant. To each pair a certain amount of ECUs will be assigned, depending on the earnings obtained by the two participants of the pair in Stage 1. So, in Stage 2 you will receive also information about the ECUs earned by the other person in your pair, (i.e. the number of ECUs obtained by each of you).

Example 1. Assume that in Stage 1 you earned 70 ECUs and the other participant in your pair earned 50 ECUs. Then, your pair will receive in total 120 ECUs, given by the sum of the two participants' earnings.

Example 2. Assume that in Stage 1 you earned 30 ECUs and the other participant in your pair earned 110 ECUs. Then, your pair will receive in total 140 ECUs, given by the sum of the two participants' earnings.

Once the ECUs are assigned to the pair, one of the two participants in the pair will be randomly chosen and he will have to decide how the total amount of ECUs assigned to the pair will be distributed between himself and the other person in the pair. So, the randomly chosen person has to indicate how many of the ECUs assigned to that pair he wishes to allocate to his counterpart in the pair. He can choose an amount between 0 and the total amount of ECUs assigned to the pair.

3.1. What is the decision you have to take in Stage 2?

All the participants in Stage 2 will have to make a decision as if they were randomly chosen to distribute the ECUs within their pair. After all participants have made their decision, the computer will randomly select one participant in each pair and his choice will be used to determine the ECUs distribution within the pair. Each participant has to make his decision without knowing the decision made by the other participants.

3.2. How your earnings in PART A will be determined?

Depending on whether you will be randomly selected or not, we have two cases:

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Case 1. You ARE randomly selected.

Your choice about how to distribute the ECUs is relevant for your earnings. This happens with $\frac{1}{2}$ probability. In this case your choice about how to allocate the ECUs between you and your counterpart will become effective.

Case 2. You ARE NOT randomly selected.

Your choice about how to distribute the ECUs is NOT relevant for your earnings. This happens with $\frac{1}{2}$ probability. In this case, your earnings for this part will be determined by the choice of another participant. If this is the case, please note that this participant is not the one to whom your choice in the first case would apply.

Example. Imagine two pairs: one formed by A and B; the other formed by C and D. According to our protocol, all four participants take a decision on how to allocate the ECUs within a pair in Stage 2. Consider now participant A.

- In case 1, his earnings in part A just depend on his choice. Moreover, his decision also affects the earning of another participant, in our case B.
- In case 2, his earnings are determined by the choice of another participant. In this case, we impose that this participant must be different than B, so he will be, C or D.

3.3. EARNINGS FROM THE EXPERIMENT

You will know whether your choice is relevant for your earnings or not at the end of the experiment (i.e. after Part B ends). Remember that at the end of the experiment either Part A or Part B will be selected by a random draw and you will receive the earnings you obtained in the randomly selected part. Therefore, since you do not know which part will be relevant for your final payment, please think carefully about each decision in each part.

DETAILED INSTRUCTION FOR PART B.

1. What is the situation you are facing in Part B?

In Part B of the experiment you will be matched with two different participants. These two participants form a pair. The decision making in this part does not involve the participant you were matched with in Part A. You will not be told who you are matched with either during or after the experiment. In Part B you will be asked to make a decision about how to distribute a variable amount of ECUs assigned to this pair of participants. You will then receive information about the earnings of the participants in the pair (i.e. the number of ECUs earned in stage 1 of Part A).

Example 1. Assume that in Stage 1 of Part A the first participant in the pair earned 130 ECUs and the second earned 10 ECUs. Then, the total amount of ECUs credited to this pair is 140.

Example 2. Assume that in Stage 1 of Part A the first participant earned 50 ECUs and the

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second participant earned 50 ECUs. Then, the total amount of ECUs credited to the pair is 110.

You will be asked to indicate how many, if any, of the total amount of ECUs you wish to allocate to each participant in the pair. You can choose an amount between 0 and the total amount of ECUs assigned to the pair. This decision is completely up to you and is confidential. Just make sure that the sum of ECUs allocated to the two participants in the pair equals the total joint earnings shown. If part B is selected to be relevant for your experimental earnings, you will earn the amount of ECUs, you obtained in Stage 1 of Part A.

2. What is the decision you have to take in Part B?

All the participants in Part B will have to make a decision as if they were chosen to distribute the ECUs for a pair of participants. Each participant has to make his decision without knowing the decision made by the other participants. The participant making the decision earns the amount of ECUs which derive from his earnings in Stage 1 of Part A. After each participant has made his decision, the computer randomly selects a participant, so his choice about how to distribute the ECUs in the pair becomes relevant for the members of a pair.

3.4. How will your earnings in PART B be determined?

Depending on whether you will be randomly selected or not, we have two cases:

Case 1. You ARE randomly selected. Your choice about how to distribute the sum of ECUs for another pair is relevant for the earnings of the pair. This happens with $1/3$ probability. In this case, your choice will become effective for the two participants in the pair and you will earn the amount of ECUs based on the earnings you earned in Stage 1 of Part A (counting zeros).

Case 2. You ARE NOT randomly selected. Your choice about how to distribute the sum of ECUs for another pair is NOT relevant for the earnings of that pair. This happens with $2/3$ probability. In this case, your earnings for Part B will be determined by the choice of another participant. If this is the case, please note that this participant is none of the two participants to whom your choice in the first case could have applied.

Example: Imagine a situation with 6 participants A, E, F, G, H and I. According to our protocol, all participants take a decision on how to allocate the ECUs within a pair in Part B. Consider now participant A and assume he is matched to participant E and F (which form a pair), while G is matched with participants H and I (which form another pair).

- In case 1, his earnings in part B just depend on his earnings in Stage 1 of Part A. However, his decision affects the earnings of a pair of participants, E and F.
- In case 2, his earnings are determined by the choice of another participant. In this case, we impose that this participant must be different than E and F, so he will be, for H or I.

3.5. EARNINGS FROM THE EXPERIMENT

You will know whether your choice is relevant for your earnings or not at the end of the experiment (i.e. after this part ends). You will know whether your choice is relevant for the pair or not at the end of the experiment. Remember that at the end of the experiment either Part A or Part B will be selected by a random draw and you will receive the earnings you obtained in the randomly selected part. Therefore, since you do not know which part will be relevant for your final payment, please think carefully about each decision in each part.