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Managing Wages: Fairness Norms of Low- and High-Performing Team Members

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Abstract

Services are often provided by groups. The question of remuneration arises both at the group level and for each individual group member. We examine the question of how relative pay should be designed within the group if all group members are to regard the payment scheme as fair. We use a three-step laboratory experiment to compare which fairness norms are chosen by high-performing and low-performing group members. It turns out that both types of group members prefer the performance pay principle. Support for equal pay is negligible. However, the low performers use their bargaining power to improve their position, but without deviating from the performance principle substantially. A random influence on the performance of the players does not change the results.

Keywords

Performance principle, fairness norms, relative remuneration

JEL-Classification

C91, C92, D31, D90, J31, M52

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1 Introduction

Whenever people are to be remunerated for the services they have provided, the question arises as to which principles should be applied. If there is more than one person involved, there are usually three questions to be answered. First, how well did they perform? The problem here is to measure the performance of each individual in such a way that a clear interpersonal comparison is possible. Second, how much is to be paid in total as remuneration? This is aimed at understanding the fundamental distribution problem that arises between those who provide a service and those who pay for it. These first two questions are considered resolved in the following. We consider a situation in which the performance of an individual can be clearly observed and in which the value of the services provided is determined ex ante.

The third question, however, still remains to be answered; that is how the remuneration relationship between the people involved is to be determined. Together they have provided an "overall service" and now it is necessary to establish how the "cake" is to be shared among the various people who have provided different levels of service. This question is of considerable practical relevance and importance. It must always be answered when the combined performance of individuals results in a group performance – and this is very often the case in an economy based on the division of labor. It is of utmost importance in this context whether the distribution applied is considered fair by all concerned. For example, distributions perceived as "unfair" are likely to have a negative impact on performance incentives in the future, which can be very detrimental, especially in the case of repeated interactions. Thus, from a management perspective, deciding on the system of remuneration is highly important. This holds regardless of the hierarchical level at which a group and a decision maker interact. Group members who do not believe the remuneration system is fair have the potential to cause major problems.

The distribution decision considered here is often based on two polar positions. The advocates of the performance principle emphasize that it is only fair to base remuneration strictly on individual performance. The share of the cake would then have to correspond to the share of the total output that was produced. The opposite standpoint, team remuneration based on equal distribution, requires the cake to be shared evenly among all the group members. Which of the two positions is preferred depends largely on how one deals with individual "capacity", which is expressed in the fact that productivity in the provision of services can vary. The proponents of equal distribution could argue that it does not depend on output, but on the input provided. Even if output is at different levels, one should assume that everyone's input is the

same – and thus also the decisive factor for remuneration. In this sense, higher capacity is a kind of gift over which capable individuals have no control and for which they should not be rewarded. The advocates of the performance principle will see this differently and point out that higher performance (and capacity) goes hand in hand with a higher willingness to perform – and this should by all means be rewarded.

Which of the two positions or which compromise is considered correct is a normative question. This involves a certain amount of conflict, because a lack of consensus on fundamental normative issues will lead to persistent conflicts and associated distributional struggles, which can have considerable negative external effects. At first glance, there is much to suggest that the performance principle will prevail because it is the one that favors those who are efficient and thus probably those who tend to move up in the hierarchy, where they can determine how "the cake is distributed".

From a management perspective, individual performance incentives should outperform team remuneration because they avoid the free rider problem associated with team remuneration (Alchian and Demsetz 1972). Lazear (2000) and Jones et al. (2010), for example, provide evidence that introducing a performance-related incentive scheme increases productivity significantly. Surprisingly, the results of empirical research show that it is, in fact, team remuneration that is the rule rather than the exception (Kruse et al. 2010, Lawler and Mohrman 2003, Lazear and Shaw 2007).[1] Andersson et al. 2017 show that a "triple fit" between personal preferences, organizational values and incentive mechanisms is important for the productivity of teams. Prosocial oriented people are more productive in social oriented organizations if the remuneration is not based on personal performance but on team productivity.[2] Although this is an interesting and important finding, it alone cannot explain the dominance of team remuneration systems. Thus, the question remains why firms tend to abstain from performance principles when they have to pay groups.

An obvious explanation could be that managers fear that those of low capacity who would suffer under a system of performance pay could become frustrated and that this might have negative external effects on the performance of all the group members. For example, Jones et

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[1] In the personnel literature, there is also robust evidence that supervisors, when rating workers, usually do not differentiate enough between low and high performers (Prendergast 1999, Moers 2005). One main reason discussed in that literature is inequity among co-workers – although an insufficient differentiation can cause productivity losses when high performers are not rewarded and low performers are not sanctioned adequately (e.g., Berger et al. 2013).

[2] There is a large literature on incentives in groups (see, for example, Prendergast 1999 for a literature review). Eckel and Grossman (2005) and Kerr and Slocum (1987), for example, focus on team identity as an important factor. Team building exercises and communication are also considered as a tool to increase productivity in groups (Buller and Bell 1986, Riener and Wiederhold 2016, Sutter and Strassmair 2009).

al. (2010) report evidence that managers have concerns that introducing a performance-related pay system might endanger cooperation. If the subgroup of "underperformers" in a group behaves destructively in the case of performance pay, productivity in a team remuneration environment could be higher although individual performance is not incentivized. One reason for destructive behavior or frustration may be that those discriminated against under the performance principle do not believe in the fairness of this kind of remuneration principle. Having to work in the knowledge that one is being treated unfairly can lead to a high degree of frustration. In line with this reasoning, Matsumura and Shin (2006) show, for example, that performance is lower if workers perceive the incentive mechanism as unfair. This indeed confirms that one possible explanation for the prevalence of team remuneration could be that *managers believe* that underperforming workers regard the performance pay principle as unfair. The question is whether the performance principle is in fact the preferred principle of the high performers only, or whether it is based on a broad consensus.

We examine this question with the help of a laboratory experiment in which the high and low performers are in a position to determine the distribution standard. In short, the experiment shows that there really seems to be a consensus regarding the performance principle, because even the low performers follow it over long distances. However, we also see that the underachievers use the leeway they get when they determine the distribution standard for themselves and change the distribution in their favor, without contradicting the performance principle to any great extent. In the real world, performance is not only determined by capacity and effort, but to some extent also by luck. To reproduce this in the lab, we use treatments with a stochastic influence on performance to see if this reduces the acceptance of the performance principle. Our results show that this is not the case.

The remainder of this paper is structured as follows: In Section 2, we describe the experimental design. Results are presented in Section 3. Section 4 concludes.

2 Experimental Design

Basic design

In order to answer our research question, an experimental design is needed in which a group of subjects perform a clearly measurable task. We also need a decision maker who decides how the performance result is shared between the group members. In addition, the design should

provide us with information about what fairness standards the decision maker considers appropriate. All these requirements are met by the following three-part design, which is used in all treatments. Translated instructions can be found in our online appendix A1.

Part 1 – Real Effort Task

To obtain a simple measurable performance for each subject, the experiment starts with a real effort task. Subjects have to solve arithmetical problems and for each correctly solved problem, they get one point. Subjects are informed that each point has a value of 0.2 euros. After that, subjects are randomly selected into groups of four players. In each group, subjects are ordered according to the number of points achieved. The player with the highest number of points is player 1 (high performer in the following), the player with the lowest number of points is player 4 (low performer in the following).

Part 2 – Dictator Game

One of the players (*D*) is selected as the decision maker; the remaining three subjects are labeled R_1, R_2, and R_3. *D* is informed that she has the task of sharing the combined amount that players R_1 and R_3 have gained between R_1 and R_3. *D* is informed about the number of points each of the two players achieved and the corresponding total amount of money (total points x 0.2) that should be divided. *D* plays the role of a dictator for players R_1 and R_3, but her own payoff does not depend on the split she makes. This dictator game with an uninvolved dictator *D* informs us which fairness norm *D* considers appropriate when it comes to distributing jointly generated income between two group members.

Part 3 – Ultimatum Game

In this part, player *D* is assigned the role of the proposer in an ultimatum game with player R_2, with the game concerning the distribution of the total amount that players *D* and R_2 have achieved together. They are subject to the usual rules of the ultimatum game. Player *D* makes a proposal and player R_2 accepts or rejects this proposal. Rejection results in both players not receiving a payoff (except for the show-up fee). This third part of the experiment examines the extent to which the player *D* deviates from the fairness norm she revealed in the second part. There can be various reasons for such deviations. It could be that *D* is afraid that her proposal will be rejected or puts selfish motives above the fairness norm she has revealed.

The treatments

We use a 2x2 between-subject design (see Table 1). The treatments differ either with respect to the distribution of the roles (*D* and R_i) or whether or not the performance is influenced by luck.

High performer decides (HP)

In this treatment, the player with the highest score (group member 1) gains the role of player *D*. Figure 1A shows the process of this treatment over the three parts of the experiment.

Low performer decides (LP)

In our LP condition, the experiment is conducted in the same way as in the HP condition. The only difference is that now player 4 – the low performer – decides in the dictator game (for players 1 and 3) and in the ultimatum game (for players 2 and 4). See Figure 1B.

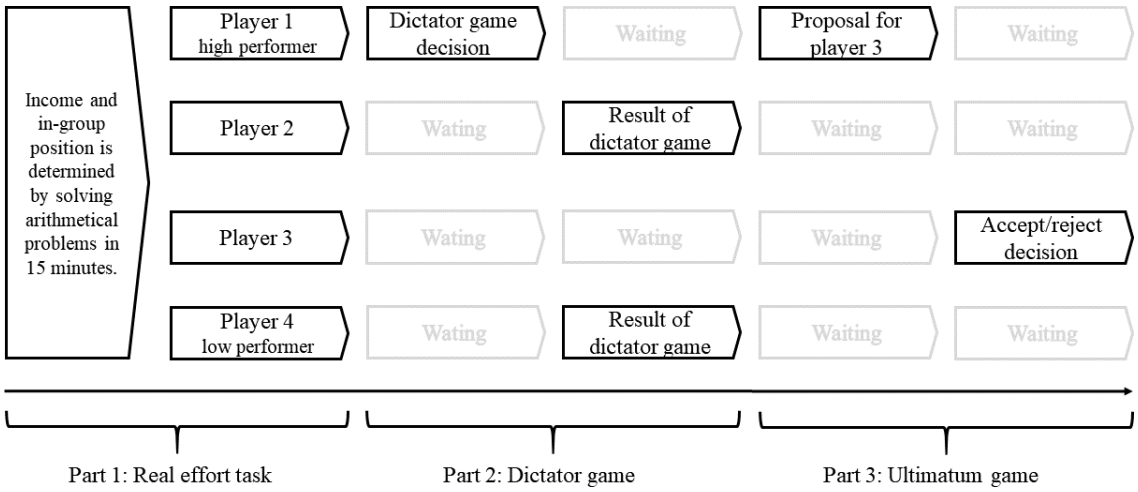

Figure 1A: Experimental design for condition "high performer decides"

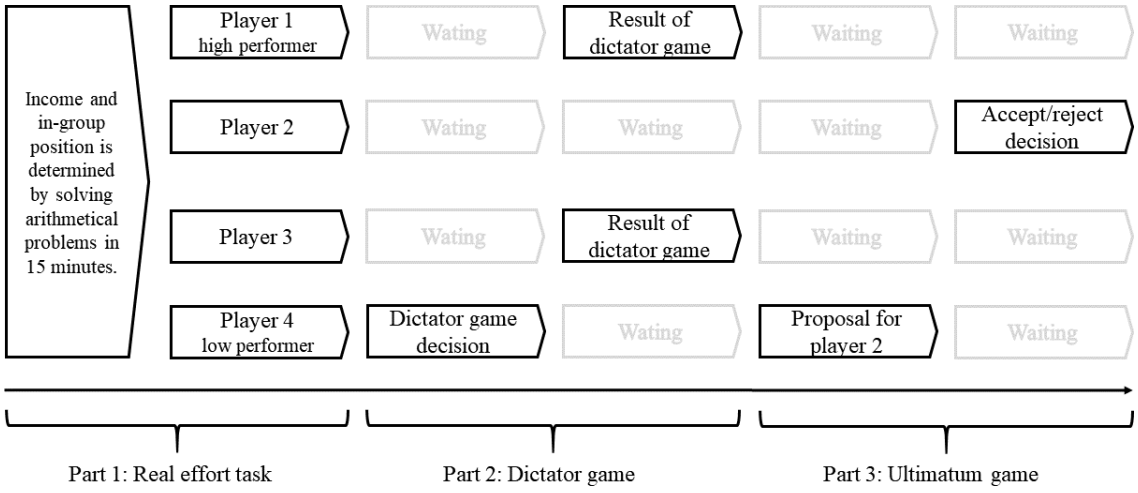

Figure 1B: Experimental design for condition "low performer decides"

NoLuck condition

In our real effort task, all participants are given 15 minutes to solve arithmetical problems that were randomly selected out of a set of 300 problems. In particular, participants are asked to find the sum of two numbers in each problem. In our *NoLuck condition*, they have to add up three-digit numbers (e.g., 348 + 497). The task is identical for each participant, and performance (i.e., number of correctly solved problems) is therefore only driven by individual effort and skills.

Luck condition

In our *Luck condition*, we introduce three different working packages that differ in the level of difficulty. In working package 1, one third of the set of problems – from which the problems to be solved are randomly selected – consists of two-digit numbers (e.g., 23 + 45) and two thirds of the problems consist of three-digit numbers. In working package 2 (as in the NoLuck condition), all the problems consist of three-digit numbers. In working package 3, one third of the problems consist of four-digit numbers (e.g., 6842 + 3087) and two thirds of the problems consist of three-digit numbers. At the beginning of the real effort task, each participant is randomly assigned to one package by choosing one of three sealed envelopes that include a code number. This number corresponds to a working package. Consequently, the participant's performance depends not only on individual effort and skills, but also on luck in receiving a simple or hard working package.

Table 1: Treatment overview (between-subject design)

		Luck and performance	
		No Luck	**Luck**
Role of player *D*	**High performer decides (HP)**	NoLuck-HP	Luck-HP
	Low performer decides (LP)	NoLuck-LP	Luck-LP

Design Motivation

Our design allows the dictator game (part 2) to reveal the fairness standard that the deciding players deem appropriate. When deciding in part 2 of the experiment, the decision makers do not yet know that part 3 will follow. In the ultimatum game (part 3), it can be checked whether the deciding players apply the same norm they revealed in the dictator game or deviate from it in their distribution proposal.

In condition HP, the decider is the player who has previously shown the highest performance in the group. We therefore expect that in this treatment, decisions will be based strictly on relative performance, i.e. the performance principle will be applied. In the dictator game, the

deciding players will make a division according to the performances of players 2 and 4. In the ultimatum game, too, they will be strongly influenced by the performance data. However, especially if the differences in performance are very clear, they could, due to a fear of rejection, deviate from the performance principle towards a more equal distribution. The strength of this deviation – a major advantage of our design – allows conclusions to be drawn as to how certain the decision makers are that the performance principle is generally accepted as a fair distribution principle. The stronger this is, the less the powerful decision makers will deviate from the performance principle in the third part of the experiment.

Our LP condition makes it possible to check whether the fairness standard of low-performing decision makers differs from that of the high-performing decision makers. The performance principle benefits the powerful decision makers and it is therefore to be expected that they regard the performance principle as the valid fairness standard. But does this also apply to the low performers? Our hypothesis is that we will see a clear shift towards the principle of equality, which will be evident in both the dictator game and the ultimatum game. In the ultimatum game, the low-performing decision makers also have room to maneuver in the direction of equal distribution. A division based on performance would result in a payoff distribution that favors the responder. Since a rejection is not to be expected in the standard ultimatum game as long as the responder receives at least as much as the proposer, the decision player *D* can change the division in the direction of equal distribution and therefore increase her payoff in this case without running the risk that the responder will reject. The strength of this deviation can also be seen as a measure of how strongly the performance principle is anchored as a fairness standard. If the decision maker assumes that the responder regards the performance principle as the actual fairness standard, this limits her scope for deviations in the direction of equal distribution because she must then expect the responder to reject even if the responder receives the same amount or even more than the proposer.

Sample and Data

The experiment was conducted at the computerized experimental laboratory of the University of Magdeburg (MaXLab) in 2018. The experimental software was programmed and used with the software z-Tree (Fischbacher, 2007). The participants were recruited with hroot (Bock et al. 2014). In total, 476 subjects (mainly undergraduate students, 51% females) participated and earned, on average, 19 euros including a show-up fee of 5 euros in approximately 45 minutes (approximately 25.30 euros per hour). The subjects were assigned equally to our treatments.

Generally, we had 120 subjects and 30 groups of four players in each treatment. Due to no shows, however, we had only 116 subjects and 29 groups in the treatment Luck-LP.

3 Results

On the basis of the results of all the dictator and ultimatum games in all treatments, individuals can be classified in five categories. Table 2 gives an overview and corresponding examples for the actual performance of two hypothetical players and the proposed payoff distribution. All the data and the corresponding categorization can be found in our online appendix A2.[3]

Table 2: Payoff distribution categories with corresponding examples

Category	**Description**	**Actual performance**		**Proposed distribution**	
Performance pay	Players are paid on the basis of their performance.	16	10	16	10
Equal pay	Players receive the same amount of money.	16	10	13	13
Performance/Equal pay	Players are paid between performance pay and equal pay.	16	10	14	12
High performer extreme	High performer receives more than her performance suggests.	16	10	18	8
Low performer more	Low performer receives more than high performer.	16	10	10	16

Note: This table shows the five categories we use to classify each decision of the decision makers on the payoff distribution. The numbers shown are corresponding examples for the actual performance of two hypothetical players and the proposed payoff distribution.

Dictator Game: Majority Reveals Performance Pay as Fairness Standard

The results of the dictator game are used to determine the fairness standard that decision makers deem appropriate. Figures 2A and 2B show the distribution of our five categories in all treatments for the dictator game. We observe that subjects have a clear preference for performance pay in all conditions. Approximately 70% of all decisions are classified in this category. In contrast, equal pay is only preferred in approximately 10% of all decisions. The same holds for the other categories. Most importantly, this result is independent of whether the high or low

[3] In some cases, proposed payoff distributions differ only slightly from the actual performance. For example, actual performance was 11.4 and 9.4 and the proposed distribution of the decision maker was 11.0 and 9.8. In such a case, we still categorized the decision as performance pay. In fact, we allow for a lower and upper threshold of 10% of the high performance amount. Minor differences are likely as decision makers are not directly informed about the exact absolute amount of money of each of the two players. Instead, decision makers are informed about the number of points each of the two players achieved and the corresponding total amount of money that should be divided. As subjects do not receive a pocket calculator, this procedure ensures that minor deviations from performance pay (e.g. due to minor calculation errors) do not lead to a misclassification.

performer decides on payoff distribution. We find no significant differences between the HP and LP treatments in condition NoLuck as well as in condition Luck (χ^2 test and Fisher's exact test: all p-values above 0.1). Consequently, we can summarize that the high and the low performing decision makers regard performance pay as the appropriate fairness standard.

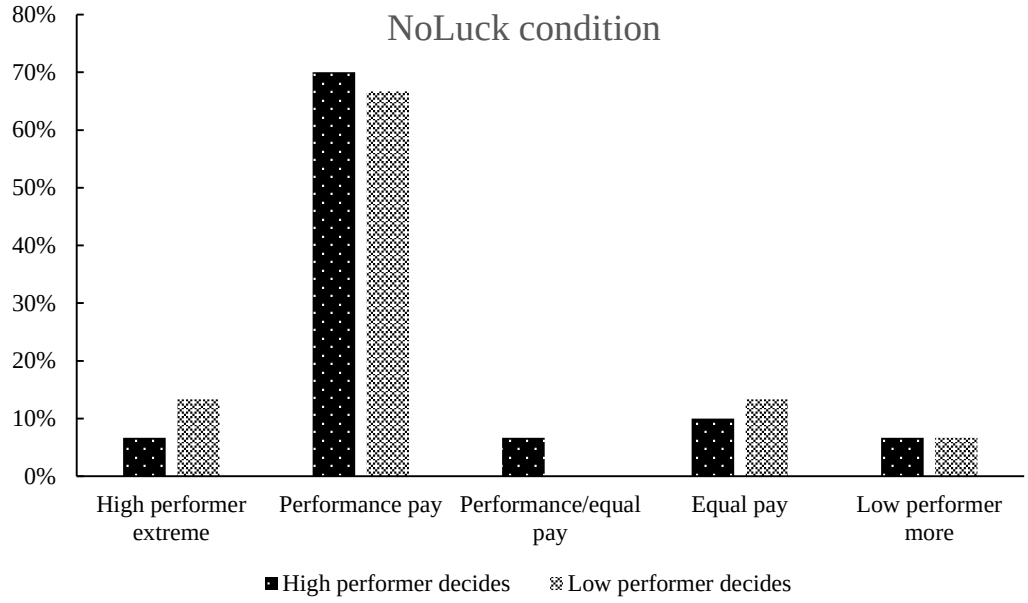

Figure 2A: Revealed fairness standard in dictator game (NoLuck treatments)

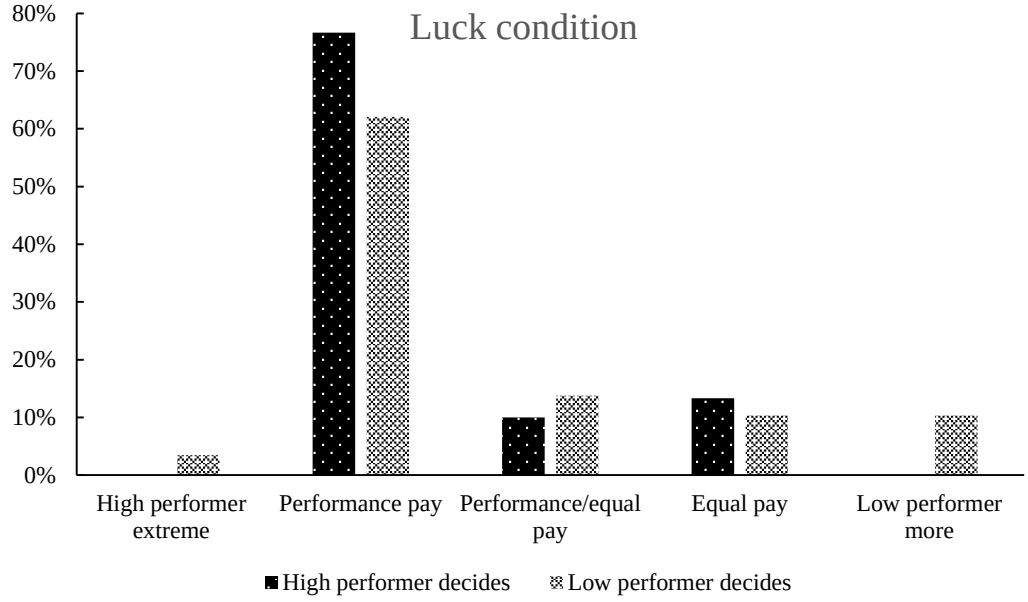

Figure 2B: Revealed fairness standard in dictator game (Luck treatments)

Furthermore, we do not observe that revealed fairness standards differ between the NoLuck and Luck treatments. In particular, we find no significant differences between the NoLuck and Luck treatments in condition HP as well as in condition LP (χ^2 test and Fisher's exact test: all p-values above 0.1). Consequently, introducing luck as a determinant of performance does not change the preference for performance pay – neither for high performers nor for low performers.

Ultimatum Game: Majority Decides for Performance Pay

The ultimatum game enables us to analyze the applied payoff distribution when the decision maker also decides on her own payoff. Figures 3A and 3B show the distribution of our five categories for the ultimatum game. Again, we observe that subjects have a clear preference for performance pay. At least 50% of all decisions are classified in this category. In contrast, equal pay is chosen in less than 20% of all decisions. The same holds for the other categories. Only in treatment NoLuck-HP do we find that equal pay is chosen more frequently (i.e., 30%). But even in this setting, performance pay is preferred by the majority.

In the NoLuck condition (Figure 3A), we find no significant differences between the HP and LP treatments (χ^2 test: $p = 0.646$, Fisher's exact test: $p = 0.691$). In the Luck condition (Figure 3B), we observe that the category distribution differs significantly between the two treatments (χ^2 test: $p = 0.023$, Fisher's exact test: $p = 0.015$). However, the two treatments do not differ with respect to the performance pay preference. In both treatments, approximately 50% decide for performance pay. The difference between the two treatments is that "performance/equal pay" and "equal pay" are more frequently chosen in treatment HP than in treatment LP and that "low performer more" is more frequently chosen in treatment LP than in treatment HP.

Consequently, we can summarize that the majority of subjects apply performance pay if they also decide on their own payoff in the ultimatum game. This holds for both high and low performers. Whereas high performers still receive the larger share of the cake when they decide, low performers give a larger share to the responder (high performer) and keep a smaller share when they decide. This is in contrast to the standard ultimatum game result, where we usually observe that proposers keep more than 50% of the available amount.

Again, we do not observe that the chosen payoff distribution differs between the NoLuck and Luck treatments. In particular, we find no significant differences between treatments NoLuck and Luck in both condition HP and in condition LP (χ^2 test and Fisher's exact test: all

p-values above 0.1). Consequently, introducing luck as a determinant of performance does not change the applied payoff distribution – neither for high performers nor for low performers.

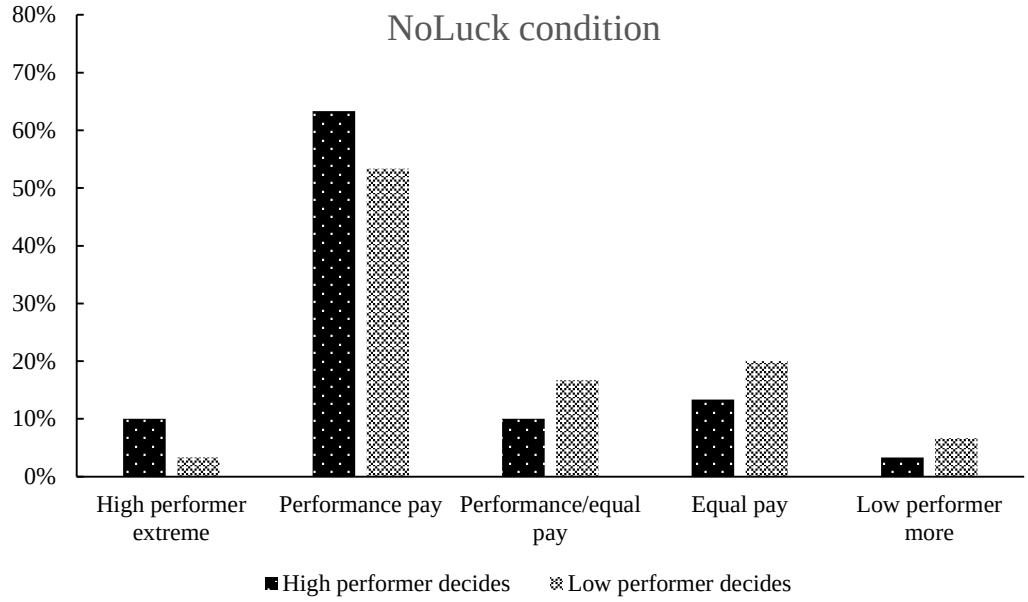

Figure 3A: Applied payoff distribution in ultimatum game (treatments NoLuck)

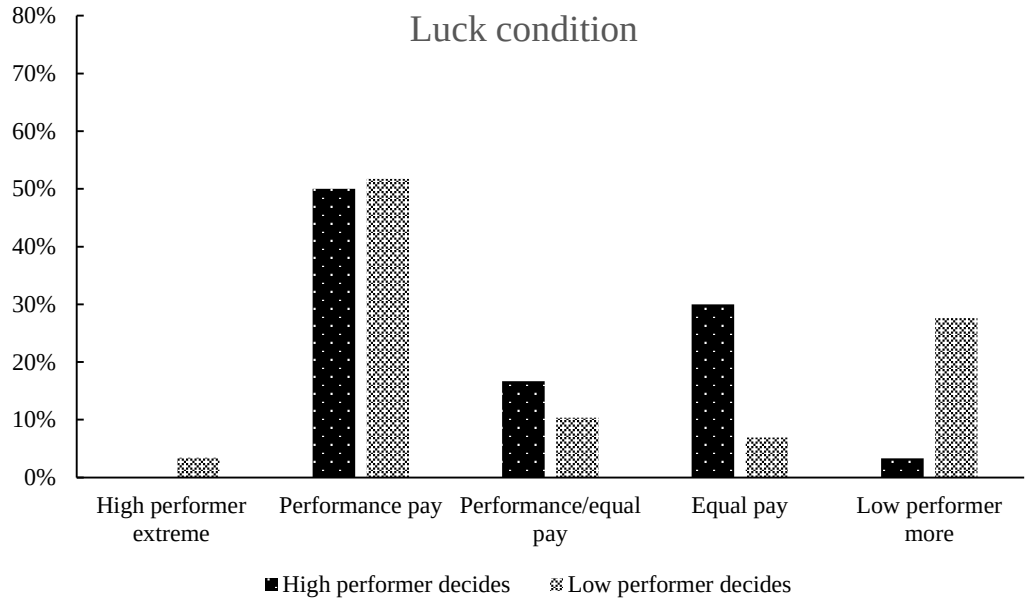

Figure 3B: Applied payoff distribution in ultimatum game (treatments Luck)

In our experiment, we observe a very low rejection rate of 5%. In fact, proposals are only rejected in six out of 119 cases: three rejections in the NoLuck condition (two in treatment HP and one in treatment LP) and three rejections in the Luck condition (all in treatment HP).[4] The same rejection rate is also observed for proposals that are in accordance with the performance principle (65 decisions, three proposals are rejected). Consequently, we can state that nearly all the proposals – and consequently also all the proposals following performance pay – are accepted by the responders.

Differences Between Dictator and Ultimatum Game: Low Performers Benefit and High Performers Suffer from Low Performer's Bargaining Power

Our experimental design allows us to analyze the individual differences between the decisions in the dictator and ultimatum games. Therefore, we can also study whether decision makers apply the same norm in the ultimatum game as they revealed in the dictator game or deviate from it in their proposals. For the latter case, we are able to determine whether the decision in the ultimatum game deviates towards low or high performer (compared to the initial decision in the dictator game). All the data and the corresponding categorization can be found in our online appendix A2. Figures 4A and 4B show the difference between the decisions in the dictator game and the ultimatum game. As we are especially interested in the behavior differences of subjects who revealed performance pay as the fairness standard, we focus on this subsample in a first step. Please notice that the decision pattern is very similar when using the full sample instead.

In all treatments, we observe that the majority of subjects (approx. 60%) are consistent in their decision making (i.e., they keep choosing performance pay). In the other cases, we find a systematic deviation behavior: nearly all the deviations are towards low performer (94%). A deviation towards high performer is only observed in two decisions (one decision in treatment NoLuck-HP and one decision in treatment Luck-LP). We find no significant differences between treatments HP and LP in condition NoLuck or in condition Luck and no significant differences between treatments NoLuck and Luck in condition HP or in condition LP (χ^2 test and

[4] We observe rejections in the following decisions. First for the NoLuck condition. In treatment HP: actual performance 19.2 and 13.6 with rejected proposal 19.2 and 13.6; actual performance 17.2 and 13.8 with rejected proposal 31 and 0. In treatment LP: actual performance 17.4 and 11.8 with rejected proposal 14.4 and 14.8. Second for the Luck condition. In treatment HP: actual performance 27.8 and 15.8 with rejected proposal 25.0 and 18.6; actual performance 20.2 and 11.4 with rejected proposal 19.0 and 12.6; actual performance 13.2 and 8.4 with rejected proposal 10.8 and 10.8.

Fisher's exact test: all p-values above 0.1). Consequently, the behavior of low and higher performers does not differ significantly. Furthermore, introducing luck does not change the behavior of low and high performers.

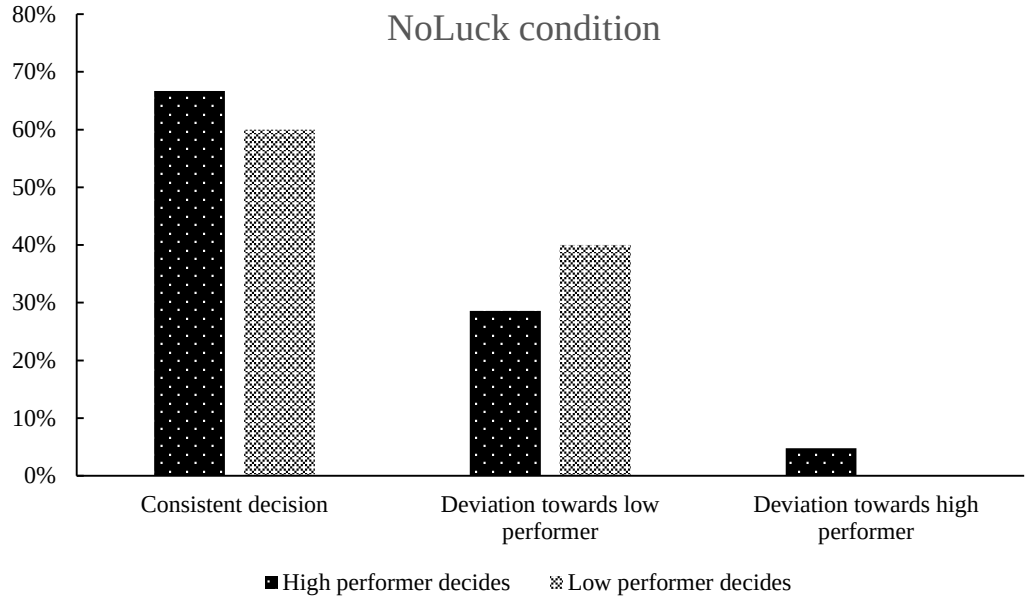

Figure 4A: Differences between dictator and ultimatum game (NoLuck treatments)

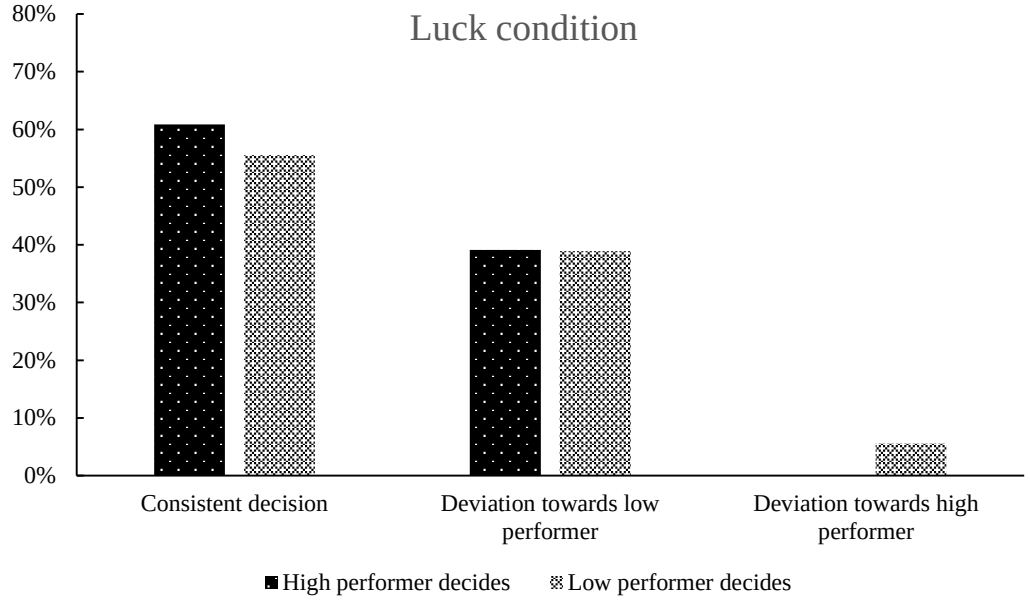

Figure 4B: Differences between dictator and ultimatum game (Luck treatments)

The previous analysis focuses on whether the decision in the ultimatum game (applied payoff distribution) differs from the decision in the dictator game (revealed fairness standard). In the following analysis, we will extend this analysis by also studying the degree of deviation. This allows us to check, for example, whether differences are more pronounced in the HP or LP treatment. Moreover, we will examine how the final payoff deviates from performance pay

for each single decision separately (dictator and ultimatum game). For this purpose, we introduce the following measure:

$$performance\text{-}pay\text{-}deviation = \frac{\frac{payoff\ based\ on\ performance\ (player\ A)}{payoff\ based\ on\ performance\ (player\ B)}}{\frac{proposed\ payoff\ (player\ A)}{proposed\ payoff\ (player\ B)}} - 1\ ,$$

where player A is the player with the higher initial payoff based on performance (i.e., points achieved x 0.2). If the measure equals 0, the decision maker has chosen performance pay. If the measure is greater (lower) than 0, the decision maker deviates from performance pay toward the low (high) performer. The higher the measure in absolute terms, the greater the deviation from performance pay.

To illustrate this, we use the following example for the decision in the dictator game in treatment HP. Suppose that the high performer observes a "performance"-payoff of player 2 of 16 and of player 4 of 8. If the high performer decides for performance pay, the deviation measure is 0 and calculated as follows: (16/8) / (16/8) – 1. If the high performer decides for equal pay, the measure is (16/8) / (12/12) – 1 = 1. If the high performer gives player 2 more than the initial payoff, say 18, the measure is (16/8) / (18/6) – 1 = -0.33. Please note that deviations from performance pay score higher, the greater both initial payoffs differ. If for example the "performance"-payoffs of players 2 and 4 are only 14 and 10, respectively, choosing equal pay would lead to a deviation measure of (14/10) / (12/12) – 1 = 0.4. Consequently, this measure takes into account how "costly" it is to deviate from performance pay. If the performed payoffs are very similar, choosing equal pay might be less problematic compared to when performed payoffs differ greatly.

Table 3 presents the mean deviation from performance pay for the dictator and ultimatum games separated according to HP and LP treatments. As we did not observe significant differences between the NoLuck and Luck conditions in our previous analyses, we decided to pool the data. Please note that the pooled results are very similar to those obtained when these two conditions are separated.

For the full sample, we observe that the mean deviation from performance pay is significantly greater than zero in the dictator and ultimatum games as well as in the HP and LP treatments (p-values presented in parentheses below mean value, one sample t-test, two-tailed, all p-values below 5%). In the dictator game, we do not find significant differences between the HP treatment and the LP treatment, with mean values of 0.23 and 0.21, respectively (p = 0.902, t-test for independent samples, two-tailed). However, we observe significant differences between the treatments in the ultimatum game. Whereas the deviation remains on a level of 0.22

in treatment HP (no significant difference to dictator game, p = 0.853, t-test for dependent samples, two-tailed), the deviation increases to 0.62 in treatment LP (significant difference to dictator game, p = 0.005). Furthermore, the deviations between both treatments in the ultimatum game are significant (0.22 vs. 0.62, p = 0.005, t-test for independent samples, two-tailed). For the case of the full sample we can thus summarize: in treatment HP, the mean deviation from performance pay has not changed from the dictator to the ultimatum game. Thus, on average, individuals do not deviate from their revealed fairness standard. However, in treatment LP, individuals deviate from their revealed fairness standard toward low performer.

Table 3 also presents the mean deviation from performance pay in a subsample where only those subjects who revealed performance pay as a fairness standard in the dictator game (according to our above described categorization) are considered. Therefore, it is not surprising that the deviation from performance pay in the dictator game is approximately zero and does not differ significantly from zero in the LP and HP treatments.[5] In the ultimatum game, however, we observe a significantly positive deviation from performance pay (p = 0.002 for HP and p < 0.001 for LP) in both treatments. The differences between the dictator and ultimatum games are significant in both treatments (p = 0.006 for HP and p < 0.001 for LP). This is in contrast to our analysis with the full sample, where we only observed a significant increase in treatment LP. Furthermore, we observe in our subsample analysis that the deviation from performance pay in the ultimatum game is still significantly higher in treatment LP with a mean value of 0.70 than in treatment HP with 0.21 (p = 0.007).

Let us summarize what has been observed. First, our results provide evidence that individuals are for the most part consistent in their decision making. Second, we also observe, however, that low performers benefit and high performers suffer from the bargaining power of the low performers in the ultimatum game. This effect is strongest in the treatment where the low performer decides.

[5] Please notice that slight deviations from performance pay can result as we allow for minor differences when categorizing our individuals (see footnote 2 for more details).

Table 3: Mean deviation from performance pay

Deviation	Full sample			Subsample: performance pay as fairness standard		
	HP decides	**LP decides**		**HP decides**	**LP decides**	
Dictator	0.23 (p = 0.014)	0.21 (p = 0.007)	p = 0.902	0.02 (p = 0.166)	0.02 (p = 0.232)	p = 0.817
Ultimatum	0.22 (p < 0.001)	0.62 (p < 0.001)	p = 0.005	0.21 (p = 0.002)	0.70 (p < 0.001)	p = 0.007
	p = 0.853	p = 0.005		p = 0.006	p < 0.001	

Note: This table shows the mean deviation from performance pay for the dictator and ultimatum games separated for the HP and LP treatments. In the subsample analysis, we only considered those subjects who revealed performance pay as a fairness standard in the dictator game (according to our categorization described above).

4 Summary and Conclusion

In our experimental study, we analyze the principles applied by low and high performers when deciding on the distribution of labor income. In particular, we examine the fairness standard that a decision maker deems appropriate and we test whether she applies this standard to herself if she has the opportunity to do so. We provide five main findings.

First, we observe that the high and the low performing decision makers regard performance pay as the appropriate fairness standard. There is negligible preference for equal pay. Second, if subjects also decide on their own payoff, the majority of subjects apply performance pay. Whereas high performers still receive the larger share of the cake when they decide, low performers give a bigger share to the responder (high performer) and keep a smaller share when they decide. This is in contrast to the standard ultimatum game result, where we usually observe that proposers keep more than 50% of the available amount. Third, nearly all the proposals (95%) following performance pay are accepted by the responders.

Fourth, individuals are in the main consistent in their decision making. Thus, the applied income distribution is largely in line with the revealed fairness standard. However, we also observe shifts toward low performers. The explanation is the bargaining power of the low performers. In the treatment "high performer decides", the credible threat of a low performer to reject the high performer's offer can cause a high performer to deviate from performance pay toward the low performer. Here high performers are driven by fear. In the treatment "low performer decides", it is very likely that slight deviations from performance pay toward the low performer are not rejected by the high performers as they will still receive more than 50% of the total amount of money that can be distributed by the low performer. Given the standard result in ultimatum games that an offer of more than 40% is unlikely to be rejected, even equal

pay is likely to be accepted by the high performers. Thus, low performers can feel confident when deviating from performance pay toward low performers. Here low performers are driven by egoism. In both treatments, low performers benefit and high performers suffer as a consequence of the bargaining power of the low performers. However, the effect is even more pronounced in the treatment where the low performer decides. Fifth, introducing luck as a determinant of performance does not change the observed behavior – neither for high performers nor for low performers.

Our results show that the application of the performance principle should meet with a broad consensus. Even if the less capable players use the position of the proposer in the ultimatum game to improve their situation a little, this does not change the fact that the performance principle seems to be deeply rooted in them. In any case, our results do not allow us to conclude that they regard this principle as unfair. In this respect, the fear that performance-related pay in a team could lead to destructive behavior is not supported by our findings.

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Appendix (Online Appendix, not intended for publication)

A1 Instructions

Appendix A1 includes the translated instructions (from German). Instructions were shown on the computer screen.

The following colors indicate which parts of instructions belong to our treatments.

NoLuck and Luck treatments:

NoLuck treatment only:

Luck treatment only:

Welcome! → All players

You take part in an experiment which consists of several stages. Together with three other participants you form a group of 4. For your participation you will receive 5 Euro at the end of the experiment. In addition, you can increase your payment depending on the development of the experiment. The exact procedure of the experiment is shown on the screen.

In the first part of the experiment you have **15 minutes** to solve arithmetical tasks. Each correct solution scores one point. Please note that the payoff you receive at the end of the experiment may depend, among other things, on the number of points you score.

The experiment starts as soon as you click "Next".

Click "Next" to get additional information on the tasks.

Selection of tasks → All players

Your task is the addition of numbers. In total, there are 300 tasks that may differ in their level of difficulty. There may be tasks in which 2 two-digit numbers, 2 three-digit numbers or 2 four-digit numbers must be added. There are three different task packages. The packages differ in the proportion of tasks in which two-, three- and four-digit numbers must be added. There are the following task packages:

package	Number of tasks with ...		
	…two-digit numbers	…three-digit numbers	…four-digit numbers
1	100	200	0
2	0	300	0
3	0	200	100

There are three closed envelopes at your desk. Each of the envelopes contains exactly one of the task packages. However, you do not know in advance which task package is contained in which of the envelopes.

Please select one of the three envelopes and open it. Please leave the other two envelopes closed. Otherwise, you will be excluded from the experiment. An employee will collect the two sealed envelopes immediately.

In the following, enter the ID that was in the envelope you opened. After clicking "Save", you will see which task package you have selected with your envelope.

ID of your task package: [ID task package]

[button save]

You have selected the task package [number of task package] with [number of two-digits numbers] two-digit tasks, [number of three-digit numbers] three-digit tasks, and [number of four-digit numbers] four-digit tasks.

The experiment starts as soon as you click "Next".

Arithmetical Tasks → All players

You have processed the following number of tasks so far: [current number]

You have scored the following points so far: [current score]

[number 1] + [number 2] = [input field]

Result → All players

You have achieved [score] points.

Decision → High performer decides: player 1, Low performer decides: player 4

You will be assigned to two players from your group. Player A has reached [points player A] points and player B has reached [points player B] points. Each point is worth 0.20 Euro, i.e. the total points of the two players are worth [amount dictator] Euro.

Your task now is to split this amount between the two players. The players will be paid at the end of the experiment according to your chosen distribution.

Share for player A (in Euro): [input field]

Share for player B (in Euro): [input field]

Result → High performer decides: player 2 and 4, Low performer decides: player 1 and 3

A player in your group was allowed to split a total of [amount dictator] Euros between you and another player in your group.

Your payoff from this part of the experiment is **[payoff dictator] Euro**.

Decision → High performer decides: player 1, Low performer decides: player 4

You will now be assigned to the fourth player from your group (C). This player C has reached [points player C] points. You yourself have reached [points] points. Each point is worth 0.20 Euro, i.e. the total value of the points reached by both players is [amount ultimatum] Euro.

Your task now is to propose to player C how this amount should be divided between you and C. If C accepts this proposal, it will be split accordingly. If C rejects your proposal, neither you nor C will receive a payoff from this part of the experiment, i.e. both of you will only receive the fixed payoff of 5 Euro.

Share for you (in Euro): [input field: amount proposer]

Share for player C (in Euro): [input field: amount receiver]

Decision → High performer decides: player 3, Low performer decides: player 2

A player in your group was allowed to distribute a total of [amount ultimatum] Euros between you and him.

Please decide whether you agree to this distribution. If you accept this proposal, it will be split accordingly. If you reject this proposal, neither you nor the other player will receive a payoff from this part of the experiment, i.e. both of you will only receive the fixed payoff of 5 Euro.

Share for the other player (in Euro): [input field: amount proposer]

Share for you (in Euro): [input field: amount receiver]

[button accept] [button reject]

Decision → High performer decides: player 1 and 3, Low performer decides: player 2 and 4

The proposal was [result of vote: rejected/accepted].

Your payoff from this part of the experiment is [payoff ultimatum] Euro.

Decision → High performer decides: player 1, Low performer decides: player 4

We would now like to ask you for your assessment which task package was processed by the different players. You get 0.50 Euro for every correct choice.

For your information, here are the three available packages again:

package	**Number of tasks with ...**		
	…two-digit numbers	…three-digit numbers	…four-digit numbers
1	100	200	0
2	0	300	0
3	0	200	100

[The entries appear one after the other and are not visible at the same time.]

Please select which task package player A ([score player A]) had to work on:

[button package 1] [button package 2] [button package 3]

Please select which task package player B ([score player B]) had to work on:

[button package 1] [button package 2] [button package 3]

Please select which task package player C ([score player C]) had to work on:

[button package 1] [button package 2] [button package 3]

The experiment continues as soon as you have made a selection and click on "Next".

Decision → High performer decides: player 3, Low performer decides: player 2

We would now like to ask you for your assessment which task package was processed by the player who submitted the offer to you. You get 0.50 Euro for every correct choice.

For your information, here are the three available packages again:

package	**Number of tasks with ...**		
	…two-digit numbers	…three-digit numbers	…four-digit numbers
1	100	200	0
2	0	300	0
3	0	200	100

Please select which task package the player who submitted the offer to you had to work on:

[button package 1] [button package 2] [button package 3]

The experiment continues as soon as you have made a selection and click on "Next".

Payoff → All players

The experiment is now over.

Your payoff including the fixed show-up fee is [total payoff] Euro.

Please remain seated until you receive further information. Now please click on "Next".

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A2 Data and categorization

NoLuck-HP treatment

	Dictator game					Ultimatum game					
Subject ID	Actual performance		Proposed distribution		Category	Actual performance		Proposed distribution		Category	Deviation
	P2	P4	P2	P4		P1	P3	P1	P3		
4	14.2	10.2	14.2	10.2	Performance pay	19.8	13.4	16	17.2	LP more	towards LP
7	16.8	5.4	16.8	5.4	Performance pay	22.2	12	22.2	12	Performance pay	consistent decision
11	16.8	12.6	16.8	12.6	Performance pay	19.2	13.6	19.2	13.6	Performance pay	consistent decision
16	13.6	12	12.8	12.8	Equal pay	15.2	13.6	23.8	5	HP extreme	towards HP
17	15.8	9.40	12.6	12.6	Equal pay	23.4	11	25	9.4	Performance pay	towards HP
61	8	3.2	8	3.2	Performance pay	11.2	6	8.6	8.6	Equal pay	towards LP
68	20	15.4	20	15.4	Performance pay	20.6	17	20.6	17	Performance pay	consistent decision
72	16.2	12.4	16.2	12.4	Performance pay	19.4	15	18.4	16	Performance pay	consistent decision
73	11.8	5	10.4	6.4	Performance/Equal pay	12	10.8	11.4	11.4	Equal pay	towards LP
79	16.2	10	16.2	10	Performance pay	22.8	14.4	18.6	18.6	Equal pay	towards LP
83	13.8	11.4	14	11.2	Performance pay	17.6	12.8	17.4	13	Performance pay	consistent decision
87	13	12	12.5	12.5	Equal pay	22.8	12.6	17.7	17.7	Equal pay	consistent decision
92	17	10.2	15	12.2	Performance/Equal pay	18.6	13.6	20	12.2	Performance pay	towards HP
93	11.6	7.4	11.6	7.4	Performance pay	17.6	8.8	17.6	8.8	Performance pay	consistent decision
100	16	7.4	16	7.4	Performance pay	16.4	8.4	16.4	8.4	Performance pay	consistent decision
101	13.4	9.40	13.4	9.40	Performance pay	13.4	12.4	13.4	12.4	Performance pay	consistent decision
107	16.4	9.6	18	8	Performance pay	16.4	12.4	18	10.8	Performance pay	consistent decision
111	15.4	13.2	15.4	13.2	Performance pay	28.6	13.4	25	17	Performance/Equal pay	towards LP
116	12.2	8.2	12.2	8.2	Performance pay	23	10.6	20	13.6	Performance/Equal pay	towards LP
118	12.4	8.6	12	9	Performance pay	13.4	12.4	15.4	10.4	HP extreme	towards HP
124	15.8	10	10	15.8	LP more	17.4	15	17.4	15	Performance pay	towards HP
125	17.8	7.4	7.4	17.8	LP more	18	17	18	17	Performance pay	towards HP
131	20.6	13.2	23.8	10	HP extreme	24.2	14.2	24	14.4	Performance pay	towards LP
135	19.6	9.8	20	9.4	Performance pay	28.6	12.6	28.2	13	Performance pay	consistent decision
138	19.6	13.4	19	14	Performance pay	24.4	13.8	21.2	17	Performance/Equal pay	towards LP
143	10.6	6	10.6	6	Performance pay	11.4	9.40	11	9.8	Performance pay	consistent decision
147	16.8	14.2	16.8	14.2	Performance pay	20.6	16.6	20.6	16.6	Performance pay	consistent decision
151	13.2	8.6	12	9.8	Performance pay	20.2	11.6	20	11.8	Performance pay	consistent decision
155	18.8	9.6	18.8	9.6	Performance pay	27.4	18	27.4	18	Performance pay	consistent decision
159	14.4	11.4	17	8.8	HP extreme	17.2	13.8	31	0	HP extreme	c egoistischer

NoLuck-LP treatment

	Dictator game					Ultimatum game					
Subject ID	Actual performance		Proposed distribution		Category	Actual performance		Proposed distribution		Category	Deviation
	P1	P3	P1	P3		P2	P4	P2	P4		
164	16.4	12.8	16.4	12.8	Performance pay	16	8.8	10.4	14.4	LP more	towards LP
166	22.4	15.2	15	22.6	LP more	15.8	7.2	11.5	11.5	Equal pay	towards HP
170	20.8	12.2	21	12	Performance pay	20.6	2.8	18.4	5	Performance pay	consistent decision
175	26.4	14.6	25	16	Performance pay	16.6	11.4	17	11	Performance pay	consistent decision
177	17.4	10.4	20	7.8	HP extreme	15.2	9.4	12.3	12.3	Equal pay	towards LP
182	11	8.8	8	11.8	LP more	10	5.4	8.5	6.9	Performance/Equal pay	towards HP
187	13.2	10.4	13.6	10	Performance pay	11.8	7.6	11.4	8	Performance pay	consistent decision
189	22.2	16.8	22.2	16.8	Performance pay	20.8	13.4	20.8	13.4	Performance pay	consistent decision
194	19.8	11	19.8	11	Performance pay	15.2	8.4	13.6	10	Performance/Equal pay	towards LP
197	17.6	15.6	21.2	12	HP extreme	16	10.6	18	8.6	HP extreme	consistent decision
203	21.4	14.2	20	15.6	Performance pay	17.4	11.8	14.4	14.7	Equal pay	towards LP
208	16.2	11.6	16	11.8	Performance pay	14.2	10.6	13.8	11	Performance pay	consistent decision
209	20.2	7.8	20	8	Performance pay	16.6	5.8	14.4	8	Performance/Equal pay	towards LP
214	14	10.6	14	10.6	Performance pay	12.2	9.8	12.2	9.8	Performance pay	consistent decision
220	20	14.4	18	16.4	Performance pay	16.4	11	12	15.4	LP more	towards LP
223	24.6	15	20	19.6	Equal pay	16	11.6	15.6	12	Performance pay	towards HP
225	23.6	16	22	17.6	Performance pay	21.8	6.4	18.2	10	Performance/Equal pay	towards LP
230	21	15	18	18	Equal pay	17.2	13.4	17.6	13	Performance pay	towards HP
234	18	9.6	18	9.6	Performance pay	14.4	7.6	14.4	7.6	Performance pay	consistent decision
237	23.6	17.8	21.4	20	Performance pay	19.4	15.4	18	16.8	Performance pay	consistent decision
243	25.8	16.8	25.8	16.8	Performance pay	18.8	11.4	18.8	11.4	Performance pay	consistent decision
246	13.8	9.4	13.8	9.4	Performance pay	10.4	8.8	10.4	8.8	Performance pay	consistent decision
249	16	10.4	16	10.4	Performance pay	13	10.2	13	10.2	Performance pay	consistent decision
253	16.2	11.6	16	11.8	Performance pay	12.2	1.2	9.4	4	Performance/Equal pay	towards LP
258	23	18.4	26.4	15	HP extreme	19	17.6	20	16.6	Performance pay	consistent decision
262	17.6	13.6	15.6	15.6	Equal pay	17	7.4	12.2	12.2	Equal pay	consistent decision
266	16.8	11.4	16.8	11.4	Performance pay	14	11.4	14	11.4	Performance pay	consistent decision
272	18	15	18	15	Performance pay	16.8	9	12.9	12.9	Equal pay	towards LP
274	18	13.8	20	11.8	HP extreme	15.6	9	12.3	12.3	Equal pay	towards LP
277	22.4	17.2	19.8	19.8	Equal pay	18.6	16	18.6	16	Performance pay	towards HP

Luck-HP treatment

	Dictator game					Ultimatum game					
Subject ID	Actual performance		Proposed distribution		Category	Actual performance		Proposed distribution		Category	Deviation
	P2	P4	P2	P4		P1	P3	P1	P3		
282	21.4	11.4	16.4	16.4	Equal pay	21.8	15.6	18.7	18.7	Equal pay	consistent decision
286	16.6	6	15.6	7	Performance pay	19.8	7.8	18.5	9.1	Performance pay	consistent decision
289	14.8	11.4	13.2	13	Equal pay	17.6	13.8	16.4	15	Performance pay	towards HP
294	12.2	7.8	12	8	Performance pay	23.6	9.6	25	8.2	Performance pay	consistent decision
299	16.8	10.8	13.8	13.8	Equal pay	23.6	14.8	19.2	19.2	Equal pay	consistent decision
301	16.4	12	16.4	12	Performance pay	21.4	14.6	21.4	14.6	Performance pay	consistent decision
305	13.8	9.2	13.8	9.2	Performance pay	18.4	11.4	17.8	12	Performance pay	consistent decision
312	14.4	5	14.4	5	Performance pay	25	10.4	24	11.4	Performance pay	consistent decision
314	21.4	8	21.4	8	Performance pay	21.4	15.2	18.3	18.3	Equal pay	towards LP
320	15.6	10.4	15.6	10.4	Performance pay	18.4	12.6	18.4	12.6	Performance pay	consistent decision
322	15.2	8.8	14	10	Performance pay	15.2	14.6	14.4	15.4	LP more	towards LP
328	12.4	9.2	12.4	9.2	Performance pay	16	9.8	16	9.8	Performance pay	consistent decision
331	18.2	7.8	16	10	Performance/Equal pay	24.2	11	20	15.2	Performance/Equal pay	consistent decision
334	22.6	11.2	19	14.8	Performance/Equal pay	23.4	17.2	20.6	20	Performance/Equal pay	consistent decision
340	9.4	6.4	9.4	6.4	Performance pay	13.2	8.4	10.8	10.8	Equal pay	towards LP
341	13	6.6	13.1	6.5	Performance pay	16	12.2	14.1	14.1	Equal pay	towards LP
347	12.8	9	11.8	10	Performance pay	16.4	10.6	14	13	Performance/Equal pay	towards LP
351	17.6	12.8	18	12.4	Performance pay	27.8	15.8	25	18.6	Performance pay	consistent decision
354	17.2	8.8	13	13	Equal pay	31.6	11.4	22	21	Performance/Equal pay	towards HP
357	10.2	9.8	10.2	9.8	Performance pay	17.8	9.8	17.8	9.8	Performance pay	consistent decision
362	13.2	5.4	12.2	6.4	Performance pay	15	10.6	15	10.6	Performance pay	consistent decision
365	17.6	11.6	19.2	10	Performance pay	17.8	17	17.4	17.4	Equal pay	towards LP
370	18	10.2	18	10.2	Performance pay	20	12.2	20	12.2	Performance pay	consistent decision
373	16.2	13.2	16.2	13.2	Performance pay	16.4	15.6	16.4	15.6	Performance pay	consistent decision
379	12.4	8	12.4	8	Performance pay	20.2	11.4	19	12.6	Performance pay	consistent decision
384	15.6	6.4	14	8	Performance pay	19.2	15.4	18	16.6	Performance pay	consistent decision
385	15.8	14.6	16	14.4	Performance pay	18	15.2	16.6	16.6	Equal pay	towards LP
390	17.4	13.8	18.2	13	Performance pay	17.4	15.6	16.5	16.5	Equal pay	towards LP
393	13.4	3.4	10	6.8	Performance/Equal pay	16.4	13	14.7	14.7	Equal pay	towards LP
399	20.2	8	20.2	8	Performance pay	29.6	14.6	26	18.2	Performance/Equal pay	towards LP

Luck-LP treatment

	Dictator game					Ultimatum game					
Subject ID	Actual performance		Proposed distribution		Category	Actual performance		Proposed distribution		Category	Deviation
	P1	P3	P1	P3		P2	P4	P2	P4		
403	15.6	14	19.6	10	HP extreme	15.4	8.8	14.2	10	Performance pay	towards LP
405	15.4	7.8	15.4	7.8	Performance pay	14.4	5.4	14.5	5.3	Performance pay	consistent decision
409	23.6	13	23.6	13	Performance pay	13.6	7	13.6	7	Performance pay	consistent decision
416	18.6	13.8	19	13.4	Performance pay	14.2	10.8	14	11	Performance pay	consistent decision
418	22.4	15.8	22	16.2	Performance pay	16.4	15.6	17	15	Performance pay	consistent decision
421	20.4	9	21	8.4	Performance pay	10.4	5.8	10	6.2	Performance pay	consistent decision
427	26	7.6	15	18.6	LP more	25.6	7	19.6	13	Performance/Equal pay	towards HP
429	15	11.2	10.6	15.6	LP more	13.6	7.8	13.6	7.8	Performance pay	towards HP
433	13.8	10.8	15	9.6	Performance pay	11.8	5.8	11	6.6	Performance pay	consistent decision
439	19.8	11	19.8	11	Performance pay	19.6	9.4	14.5	14.5	Equal pay	towards LP
442	10.8	7.8	10.8	7.8	Performance pay	10	7.2	9	8.2	Performance pay	consistent decision
445	19.6	13.8	10	23.4	LP more	14	13.6	10	17.6	LP more	consistent decision
450	17.4	12.6	17.4	12.6	Performance pay	16.6	12.4	16.5	12.5	Performance pay	consistent decision
455	24.6	13.8	24.6	13.8	Performance pay	17	9.2	12.2	14	LP more	towards LP
459	17.4	12.8	18.1	12.1	Performance pay	14.2	12.2	14.35	12.05	Performance pay	consistent decision
463	21.2	8.6	20	9.8	Performance pay	16	6.6	6.6	16	LP more	towards LP
468	16	8.2	16	8.2	Performance pay	14.2	5.8	8	12	LP more	towards LP
472	16	15.2	15.6	15.6	Equal pay	16	14.4	15.2	15.2	Equal pay	consistent decision
476	24	13.4	18.7	18.7	Equal pay	14.2	7.6	11.8	10	Performance/Equal pay	towards HP
477	17.6	16	17.6	16	Performance pay	17	7.2	10	14.2	LP more	towards LP
481	17.2	14.4	17.1	14.4	Performance pay	14.6	8.6	8.6	14.6	LP more	towards LP
486	29.6	12	25.6	16	Performance/Equal pay	13.6	11.8	13.4	12	Performance pay	towards HP
490	19.4	11.8	15.6	15.6	Equal pay	16	8	10	14	LP more	towards LP
496	19.6	10.6	20.2	10	Performance pay	16.2	7.8	19	5	HP extreme	towards HP
498	24.4	13	20	17.4	Performance/Equal pay	17.4	7.6	15	10	Performance/Equal pay	consistent decision
502	18.8	16.2	20	15	Performance pay	18	10.2	10.2	18	LP more	towards LP
505	19	9	17	11	Performance/Equal pay	14.8	8.8	13.6	10	Performance pay	towards HP
509	17.2	11.8	15	14	Performance/Equal pay	14	9.4	14.4	9	Performance pay	towards HP
516	15.4	10.2	15	10.6	Performance pay	11.8	5.8	10.6	7	Performance pay	consistent decision

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