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# ABSTRACT

## Peer Effects in Pro-Social Behavior: Social Norms or Social Preferences?*

We compare social preference and social norm based explanations for peer effects in a three-person gift-exchange game experiment. In the experiment a principal pays a wage to each of two agents, who then make effort choices sequentially. In our baseline treatment we observe that the second agent's effort is influenced by the effort choice of the first agent, even though there are no material spillovers between agents. This peer effect is predicted by a model of distributional social preferences (Fehr-Schmidt, 1999). As we show from a norms-elicitation experiment, it is also consistent with social norms compliance. A conditional logit investigation of the explanatory power of payoff inequality and elicited norms finds that the second agent's effort can be best explained by the social preferences model. In further treatments with modified games we find that the presence/strength of peer effects changes as predicted by the social preferences model. As with the baseline treatment, a conditional logit analysis favors an explanation based on social preferences, rather than social norms following for these treatments. Our results suggest that, in our context, the social preferences model provides a parsimonious explanation for the observed peer effect.

JEL Classification: A13, C92, D03

Keywords: peer effects, social influence, gift-exchange, experiment, social preferences, inequity aversion, measuring social norms

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## 1. Introduction

A large body of experimental evidence challenges the assumption that individuals act exclusively to maximize their narrowly-defined self-interest. In simple games such as the dictator game, the investment game and the gift-exchange game, individuals often choose to reduce their own earnings in order to increase the earnings of their opponent, even in non-repeated and anonymous interactions where there are no positive future consequences associated with behaving pro-socially (see, e.g., Camerer (2003)). More recently, several studies of peer effects show that the extent to which people behave pro-socially is sensitive to whether they observe others doing so.[1]

Previous studies have typically interpreted these peer effects by referring to different behavioral mechanisms. One view is that pro-social behavior originates from pressures to comply with norms of 'socially appropriate' behavior in a given context (e.g., Bicchieri (2005); Keizer, Lindenberg and Steg (2008)). Here observing what others do can affect individuals' actions by influencing what they perceive to constitute appropriate behavior in a given situation. An alternative view emphasizes the role of stable distributional social preferences, which can also predict non-selfish behavior and, as we show below, peer effects. Our paper reports experiments designed to separate these leading explanations of pro-social behavior and peer effects in one particular context, involving how employee effort is sensitive to the efforts of other employees.

[1] See, e.g., Cason and Mui (1998); Bicchieri and Xiao (2009) and Krupka and Weber (2009) in the dictator game; Gächter, Nosenzo and Sefton (2010) and Thöni and Gächter (2011) in the gift-exchange game; Mittone and Ploner (2011) in the investment game. Relatedly, in public goods game experiments many people are 'conditional cooperators' who are willing to contribute in proportion to what others contribute (see, e.g., Falk, Fischbacher and Gächter (2010); Fischbacher and Gächter (2010)). The importance of conditional cooperation has also been documented in a number of recent field experiments (Chen et al. (2010); Shang and Croson (2009); Alpizar, Carlsson and Johansson-Stenman (2008); Croson and Shang (2008); Martin and Randal (2008); Frey and Meier (2004)).

Our starting point is a three-person gift-exchange game described in Section 2. In the experiment subjects are grouped in experimental 'firms' composed of three members: 'Employer', 'Employee 1' and 'Employee 2'. Employers choose wages for their employees, who choose costly effort in return. A key feature of the game is that, before making an effort choice, Employee 2 is informed of the co-worker's effort choice. Previous studies with this experimental setting have found that the availability of information about others' efforts has a systematic influence on Employee 2's decisions: in particular, when the Employer pays high wages to both employees Employee 2 expends more effort when she observes her co-worker supplying more effort, despite the fact that there are no earnings interdependencies between the employees. In this paper we replicate these results and show that a model of social preferences where individuals dislike inequitable distributions of earnings (Fehr and Schmidt (1999) can explain this effect. However, social norm compliance may also explain the positive relation between employees' efforts. To verify this, in Section 3 we identify social norms in the three-person gift-exchange game by applying the elicitation procedure introduced by Krupka and Weber (2010): using incentivized coordination games this procedure allows to determine which actions are viewed as most socially appropriate in a given situation. We find that the co-worker's effort decisions systematically affect the perception of what constitutes an appropriate effort response by Employee 2 to a high wage offer. Thus, the behavioral mechanism underlying this peer effect is unclear.

In Section 4 we compare the explanatory power of social norms versus distributional social preferences using a conditional logit framework. We consider models in which Employee 2's effort choice depends on the own payoff associated with each possible effort level, and then augment this model by including additional explanatory variables measuring the payoff inequality and/or social appropriateness of each possible effort level. We find that a social preferences model in which players trade-off own payoff and payoff inequality offers a parsimonious account of choice behavior. In our most general specification we find that payoff inequalities have a significant effect on choice behavior, whereas social appropriateness does not.

These findings stand in contrast with those of two other recent studies on the relative importance of social norms and preferences in other contexts. Krupka and Weber (2010) find that social norm compliance can explain variations in Dictator Game behavior that cannot be accounted for by social preference models, and Krupka, Leider and Jiang (2011) find substantial explanatory power from elicited social norms in Dictator and Bertrand games.

We examine the robustness of our finding in Section 5 by conducting two new treatments with modified games. In the ASYMMETRIC treatment we introduce small wage asymmetries in the high wage combination, weakening the peer effect predicted by the social preferences model. These asymmetries may also affect norm compliance by creating an opportunity for 'moral wiggle room' exploitation (Dana, Weber and Kuang (2007). Commensurate with this, we also find a weaker peer effect in the behavioral data. We also compare the explanatory power of payoff inequalities and elicited norms for this treatment and find that the social preferences model performs better in explaining choices. In our RANDOM treatment, only the wage and effort of one randomly selected employee are used for computing earnings, eliminating entirely the peer effect predicted by the social preference model. In this treatment, again consistent with the social preferences model, we do not observe a significant peer effect in the behavioral data. Again, an econometric comparison of the explanatory power of payoff inequalities and elicited norms favors the social preference model.

Overall, the distributional social preferences model organizes somewhat well peer effects in pro-social behavior in our context. However, we also observe differences across treatments in the proportion of individuals who are willing to engage in pro-social behavior, and this is more difficult to reconcile with the social preference model. In Section 6 we discuss our results and conclude.

## 2. Peer Effects in Trilateral Gift-Exchange Games

We examine peer effects in pro-social behavior using a three-person version of the standard bilateral gift-exchange game (Fehr, Kirchsteiger and Riedl (1993)). In the trilateral gift-exchange game 'firms' are composed of three members: one 'Employer' and two 'Employees'. The game begins with the Employer choosing wages for the two employees. Wages are publicly observed before employees choose costly effort which is beneficial to the Employer. Previous experiments with this type of game show the existence of a positive 'own-wage effect': employees often reciprocate higher wage offers with higher effort, as in standard two-person gift-exchange game experiments. In addition, two previous studies (Gächter et al., 2010, henceforth GNS; Thöni and Gächter (2011) show that the presence of information about the co-worker's effort can systematically affect the magnitude of this own-wage effect even when there are no earnings interdependencies between the employees. GNS and Thöni and Gächter (2011) find that when the effort of the co-worker is publicly observable employees' willingness to reciprocate high wages depends on whether the co-worker is also willing to do so. Thus, a positive and systematic correlation between employees' efforts has been documented in some trilateral gift-exchange game experiments.[2]

In this paper we begin by reporting data from new sessions using 81 subjects playing the same three-person gift-exchange game as in GNS. This game, which we refer to as the BASELINE game, has three players labeled 'Employer', 'Employee 1' and 'Employee 2'. The structure of the game, which is common information to all players, is as follows. All players

[2] A number of studies also examine the effect of information about a co-worker's wage. In some cases wage comparisons systematically affects effort decisions (e.g., Abeler et al. (2010); Gächter and Thöni (2010); Nosenzo (2011)), while in other cases such effects are weak or absent (e.g., GNS; Charness and Kuhn (2007); Güth et al. (2001)).

move sequentially: the Employer moves first and chooses a wage $w_i \in \{16,32\}$ for each Employee $i \in \{1, 2\}$. Employee 1 observes both wages and then chooses an effort level $e_1 \in \{1,2,3,4\}$. Finally, Employee 2 observes both wages *and* the effort chosen by Employee 1, and then chooses an effort level $e_2 \in \{1,2,3,4\}$. After Employee 2's choice, the game ends and the Employer's earnings are computed as:

$$\pi_{ER} = 10 \cdot (e_1 + e_2) - w_1 - w_2 \tag{1}$$

and employee $i$'s earnings are computed as:

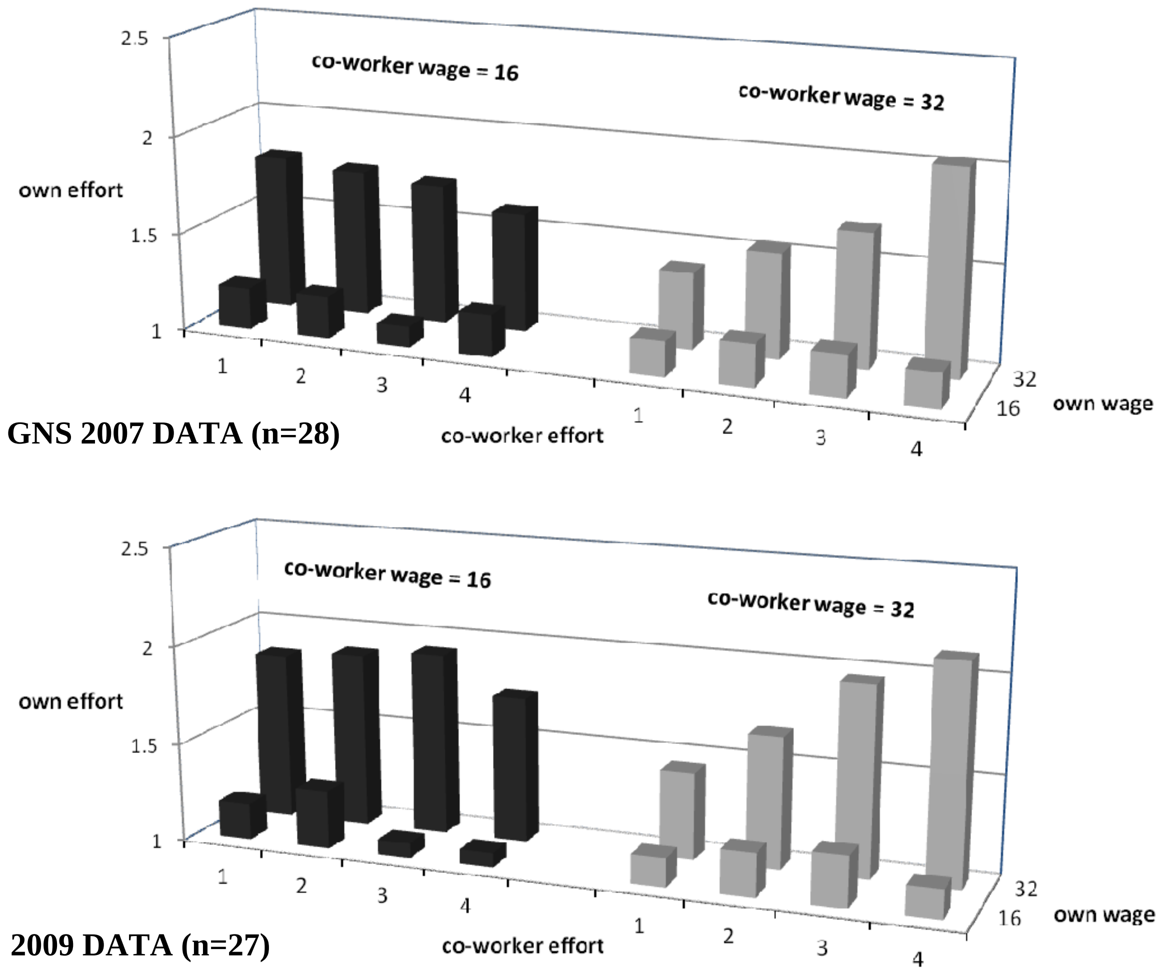
$$\pi_i = w_i - 5 \cdot (e_i - 1) \tag{2}$$

As in GNS, the new sessions implemented the game as a one-shot game using the strategy method (Selten (1967)), i.e. subjects had to make contingent decisions for all nodes at which they may have to play.[3] Thus, for each Employee 2 we observe sixteen effort choices, one for each possible combination of wages and effort chosen by the Employer and Employee 1. Figure 1

[3] Details on experimental procedures and instructions are provided in an Online Appendix. The GNS sessions were conducted in 2007 and the new sessions in 2009 using different subjects, but using the same University of Nottingham subject pool, recruitment procedures (using ORSEE, Greiner (2004)), and for the most part, the same experimental procedures and software (using z-tree, Fischbacher (2007)). The only substantive difference in procedures was that the new sessions were implemented in two parts where, in the second part subjects played the game in direct-response mode. This was done to address concerns that decisions elicited by the strategy method may differ systematically from those elicited by the direct-response method (see Brandts and Charness (2011) for a discussion of this issue). Across all treatments reported in this paper 80% of the subjects made the same direct-response choice as was implied by their submitted strategies, and we could not detect any systematic pattern in deviations from submitted strategies. The empirical analysis presented in this paper is based on the strategy method choices.

shows, for each possible combination, the average effort expended by the 28 Employees 2 who participated in the GNS experiment and the 27 Employees 2 from the new sessions.

**Figure 1:** Employee 2 average effort in BASELINE




A striking feature of Figure 1 is the similarity of the data in the two panels. In fact for none of the sixteen contingencies shown in the figure is effort significantly different across panels ($p > 0.316$ across all sixteen cases according to two-sided Wilcoxon rank-sum tests). Thus, in the remainder of the paper we pool the data from GNS and the new sessions and refer to this as our BASELINE treatment.

Two other features are striking. First, as in many other gift-exchange game experiments, Figure 1 shows a positive own-wage effect: Employees 2 reward the Employer with higher effort when they are paid a higher wage. Employee 2's effort when the own wage is 32 is significantly higher than when the own wage is 16 ($p \leq 0.004$ across all eight cases according to two-sided Wilcoxon signed-rank tests). Second, Figure 1 shows a peer effect when both employees are paid a high wage: focusing on the extreme cases where the co-worker increases her effort from 1 to 4 units, Employee 2's average effort increases by 0.65 units (from 1.42 to 2.07). This peer effect is highly significant ($p < 0.001$ according to a one-tailed Page test for ordered alternatives).

What underlies this peer effect? In the next sub-sections we discuss two alternative explanations: a model of social preferences and social norm compliance.

### *2.1. Explaining Peer Effects: the Social Preferences Approach*

A leading model of social preferences that can explain the peer effect observed in the BASELINE game is the Fehr and Schmidt (1999) (FS) model of inequity aversion.[4] According to the FS model Employee 2's utility function is:

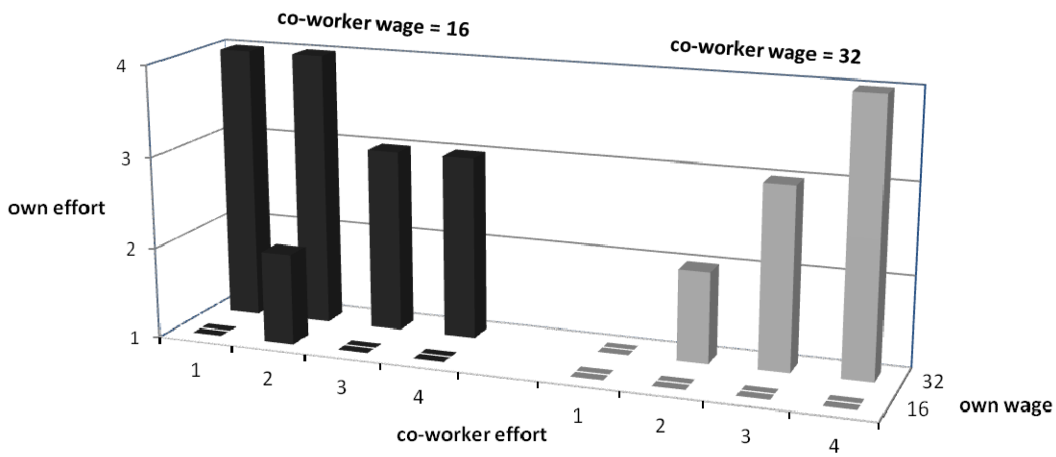
$$U_2(\pi_2, \pi_{ER}, \pi_1) = \pi_2 - \frac{\alpha_2}{2}\left(\max\{\pi_{ER} - \pi_2, 0\} + \max\{\pi_1 - \pi_2, 0\}\right) - \frac{\beta_2}{2}\left(\max\{\pi_2 - \pi_{ER}, 0\} + \max\{\pi_2 - \pi_1, 0\}\right)$$

where $\pi_{ER}$ and $\pi_{i \in \{1,2\}}$ are respectively the Employer's and employee *i*'s material payoff from the game. The parameter $\alpha_2$ measures the strength of the employee's aversion to disadvantageous payoff inequality, and $\beta_2$ measures the strength of the employee's aversion to advantageous inequality. As in FS, we assume $\alpha_2 \geq \beta_2$ and $0 \leq \beta_2 < 1$.

[4] Many other social preference models do not predict this positive peer effect. See Thöni and Gächter (2011) for a detailed analysis of the extent to which social preference models can accommodate peer effects in a closely related game. We return to this point in Section 6.

The model prediction for the BASELINE parameters depends only on the degree of 'superiority aversion' $\beta_2$. If Employee 2 is not sufficiently superiority averse (i.e., $\beta_2 < 1/2$) she will choose minimal effort irrespective of her wage and the wage and effort of the co-worker, but a sufficiently superiority averse Employee 2 ($\beta_2 \geq 1/2$) may choose non-minimal effort as shown in Figure 2.[5]

**Figure 2:** FS prediction of Employee 2 effort for BASELINE ($\beta_2 \geq 1/2$)




Note how these predictions bear out the two most distinctive features of the experiments reproduced in Figure 1: firstly, the positive own-wage effect whereby higher effort is chosen in response to a higher wage, and secondly, the strong positive relation between employees' efforts in the wage combination where both wages are high. In the model, the own-wage effect results from Employee 2's superiority aversion: when she is paid a high wage, Employee 2 is generally better off than the other firm members. By choosing non-minimal effort levels she can reduce the advantageous payoff differences relative to the Employer and Employee 1 and attain more equitable earnings distributions. The one-to-one complementary relation between employees'

[5] In a recent paper Blanco, Engelmann and Normann (2011) observe behavior in a variety of experimental games and estimate that 56% of their subjects have a superiority aversion parameter larger than 0.5.

efforts when both employees are paid a high wage results from the fact that Employee 2 is generally unwilling to choose non-minimal effort if by doing so her payoff falls (too much) short of the payoff of another firm member. Thus, when matched with a highly-paid co-worker, Employee 2 is willing to expend effort and reduce advantageous payoff inequalities only to the extent that the co-worker is also willing to do so.[6]

*2.2. Explaining Peer Effects: the Social Norms Approach*

Peer effects could also be the result of a desire to comply with social norms, i.e. collectively recognized rules of conduct that prescribe socially acceptable behaviors in a given situation (e.g. López-Pérez (2008). In the context of the trilateral gift exchange game experiment, a relevant norm is the 'norm of reciprocity' whereby employees are expected to reciprocate a kind action by the employer (i.e. a high wage) with kindness (high efforts). However, observing how the co-worker responds to a high wage offer may systematically influence Employees 2's perception of what constitutes an appropriate reciprocal response to a high wage offer. Thus, if a descriptive social norm exists in this game and behavior is guided by such norms, Employees 2's effort choice may be systematically influenced by the co-worker's effort choice.

Explaining phenomena by appealing to the influence of social norms can be problematic because of the difficulties of precisely identifying and measuring norms. In particular, often what may or may not constitute a norm is based on intuition or casual empiricism. For a more objective approach toward identifying whether social norms are relevant to the experimental environment in BASELINE, and whether they can explain the patterns of behavior discussed above, we adapted an experimental norms-elicitation procedure recently introduced by Krupka and Weber (2010) for

[6] Note that the model generates a negative relation between employees' efforts when Employee 2 is paid a high wage and the co-worker a low wage. This effect is not clearly observed in the BASELINE data.

dictator games. This procedure uses incentivized coordination games to identify which actions are viewed as most socially appropriate in a given situation. We describe this procedure for our trilateral gift-exchange game in the next section.

## 3. Identifying Social Norms in the Trilateral Gift-Exchange Game

The norms-elicitation experiment consisted of one session with 51 students recruited at the University of Nottingham and paid £5 for their participation. Upon arrival subjects learnt that their task was to read a description of four different 'situations' in which a 'decision-maker' had to choose among a number of possible alternative actions.[7] The situations reproduced the following four possible contingencies faced by Employees 2 in our trilateral gift exchange game experiment:[8]

1) Employer pays a wage of 32 to Employee 1 and a wage of 16 for Employee 2. Employee 1 chooses 1 unit of effort;
2) Employer pays a wage of 32 to Employee 1 and a wage of 16 for Employee 2. Employee 1 chooses 4 units of effort;
3) Employer pays a wage of 32 to both employees. Employee 1 chooses 1 unit of effort;
4) Employer pays a wage of 32 to both employees. Employee 1 chooses 4 units of effort.

These situations were chosen to identify any norm of reciprocity (Situation 1 vs. Situation 3, and Situation 2 vs. Situation 4), and to examine how normative judgments are affected by observation of co-workers' actions (Situation 1 vs. Situation 2, and Situation 3 vs. Situation 4).

For each of these situations and for each effort choice available to Employee 2 subjects had to rate whether the effort choice was 'very socially appropriate', 'somewhat socially appropriate',

[7] Instructions for the norms-elicitation experiment are available in an Online Appendix.

[8] We only elicited judgments about four of the sixteen possible situations faced by Employees 2 in order to keep the size of the task and the duration of the experiment reasonable for subjects.

‘somewhat socially inappropriate’, or ‘very socially inappropriate’. Subjects were told that at the end of the session the experimenter would randomly select one of the four situations, and one possible effort choice in that situation. Subjects received an additional £3 if their appropriateness rating for the selected situation and choice matched the modal rating of other subjects in the session. Thus, subjects were given incentives to reveal their perception of the *most prevalent* appropriateness judgment in the session, and not their personal judgment.[9] The results of our norms-elicitation experiment are shown in Table 1, which reports, for each situation, the average social appropriateness rating of the effort choices available to Employee 2.

**Table 1:** Elicited norms – BASELINE

| Employee 2 effort | Situation 1 ($w_1$=32; $w_2$=16; $e_1$=1) | Situation 2 ($w_1$=32; $w_2$=16; $e_1$=4) | Situation 3 ($w_1$=32; $w_2$=32; $e_1$=1) | Situation 4 ($w_1$=32; $w_2$=32; $e_1$=4) |
|---|---|---|---|---|
| 1 | 1.10 *(1.06)* | 1.02 *(0.84)* | 0.65 *(0.98)* | 0.14 *(0.40)* |
| 2 | 1.57 *(0.83)* | 2.31 *(0.71)* | 1.33 *(0.74)* | 0.92 *(0.48)* |
| 3 | 1.74 *(0.87)* | 1.88 *(0.68)* | 1.80 *(0.72)* | 1.96 *(0.44)* |
| 4 | 1.82 *(1.24)* | 1.45 *(1.27)* | 2.04 *(1.13)* | 2.96 *(0.20)* |

Notes: We transformed subjects’ appropriateness ratings into numerical scores using the following scale: very socially inappropriate = 0; somewhat socially inappropriate = 1; somewhat socially appropriate = 2; very socially appropriate = 3. Standard deviations in parentheses.

The patterns of the social appropriateness ratings are consistent with the existence of a norm of reciprocity in BASELINE: when Employee 2 receives a high rather than low wage (Situations 3 and 4 vs. Situations 1 and 2), the appropriateness of choosing low effort (i.e. 1 or 2

[9] Thus, the structure of material incentives generates a coordination game with multiple equilibria. See Krupka and Weber (2010) for a discussion of how the use of such ‘pure matching’ coordination games constitutes an incentive-compatible tool to elicit social norms, and see Burks and Krupka (2012) and Krupka et al. (2011) for other recent applications of this procedure. The use of coordination games to provide incentives for classifying natural language messages are used and discussed in Xiao and Houser (2005) and Houser and Xiao (2011).

units of effort) decreases whereas the appropriateness of choosing high effort (i.e. 3 or 4 units of effort) increases.[10] Moreover, the perception of what constitutes an appropriate reciprocal response to a high wage is systematically influenced by how the co-worker behaves in similar circumstances. The last two columns of Table 1 show the appropriateness ratings for Situations 3 and 4, where both employees receive the same high wage and the co-worker's effort is either low (Situation 3) or high (Situation 4). The table shows that choosing low effort is more appropriate in Situation 3, when the co-worker also does so, than in Situation 4. Conversely, the appropriateness of choosing high effort is higher in Situation 4 than 3.[11]

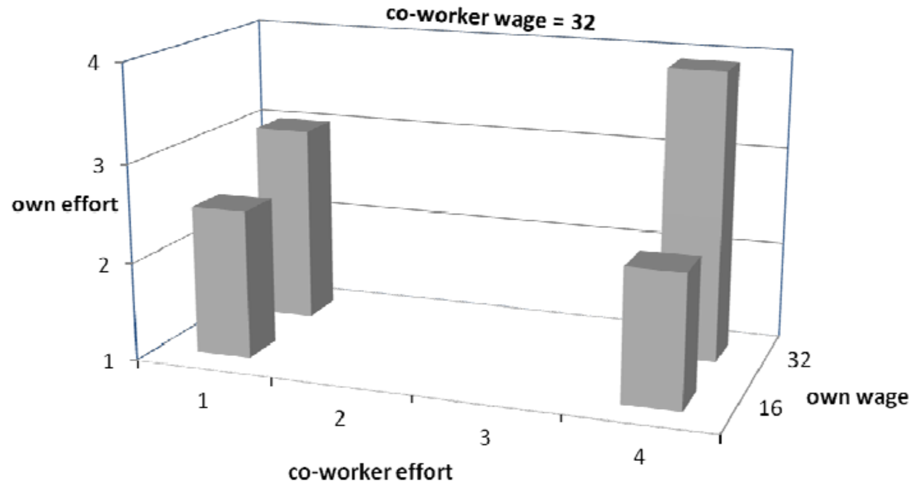
The implications of our elicited norms can be gauged by the following exercise. Assume that, if asked to make an effort choice in the role of Employee 2 in each of the four situations they evaluated, the 51 raters in our experiment would select the level of effort that they evaluated as the 'most' socially appropriate for that situation.[12] Figure 3 shows the average effort that our 51 raters would then expend in each of the four situations that they were asked to evaluate.

[10] For Situation 1 vs. Situation 3 we find statistically significant differences in the ratings for low effort (two-sided Wilcoxon signed-rank tests $p = 0.004$ for effort = 1 and $p = 0.074$ for effort = 2). For Situation 2 vs. Situation 4 we detect highly significant differences for effort choices of 1, 2 and 4 ($p < 0.001$) but not for effort = 3 ($p = 0.558$).

[11] The differences in ratings between Situation 3 and Situation 4 are highly significant according to two-sided Wilcoxon signed-rank test for effort choices of 1, 2 and 4 ($p < 0.001$). The difference is not statistically significant for effort = 3 ($p = 0.215$).

[12] If a subject assigns the highest appropriateness rating to more than one effort level, we select the effort level which gives him/her the highest material payoff.

**Figure 3:** Socially most appropriate effort choices in BASELINE




Notes: Effort choices that the raters would make on average if they chose the most socially appropriate effort level in the four situations they evaluated.

Note how the levels of effort reported in Figure 3 are higher than in the corresponding contingencies of the BASELINE experiment reported in Figure 1. This suggests that in the experiment individuals do not base their choices exclusively on social appropriateness, but take other motives (e.g. own payoff considerations) into account as well. Nevertheless, Figure 3 reproduces two distinctive features of Figure 1: firstly, for a given effort choice of the co-worker, the average effort increases with own wage (two-sided Wilcoxon signed-rank tests: $p = 0.003$ when the co-worker chooses 1 unit of effort; $p < 0.001$ when the co-worker chooses 4 units of effort). This reproduces the positive own-wage effect shown in Figure 1. Secondly, when the Employer pays a high wage to both employees, average effort depends positively on the co-worker's effort: when the co-worker's effort increases from 1 to 4 the average effort increases by 0.90 units of effort (from 3.02 to 3.92, two-sided Wilcoxon signed-rank test: $p < 0.001$). This reproduces the peer effect shown in Figure 1.

Overall, our norms-elicitation experiment reveals that if subjects comply with social norms this can also explain the behavioral regularities observed in the BASELINE game.

## 4. Disentangling Social Preferences and Social Norms in the Trilateral Gift Exchange Game

To investigate whether subjects are actually guided by distributional concerns and/or by a desire to comply with social norms we follow Krupka and Weber (2010) and Krupka, Leider and Jiang (2011) and use a conditional logit model to examine the explanatory power of these motives in the BASELINE game.

In the model the probability that a subject in the role of Employee 2 chooses effort level k depends on the utility associated with that choice, U(k), relative to the utility associated with the other alternatives:

$$\Pr\{e_2 = k\} = \frac{\exp\{U(k)\}}{\sum_{i=1,\dots,4} \exp\{U(i)\}}, k = 1, \dots 4$$

For each combination of wages and co-worker's effort, the four possible effort levels available to Employee 2 offer different outcomes in terms of own payoff, distribution of payoffs, and social appropriateness. Our first specification assumes that utility depends only on own payoff:

$$U(k) = \theta_1 \pi_2 = \theta_1 (w_2 - 5(k - 1)). \qquad \text{[SELFISH]}$$

The selfish model predicts a distribution of effort choices for Employee 2 that is independent of own wage or co-worker's effort. The shape of the distribution depends on the $\theta_1$ parameter. When $\theta_1$=0 each effort choice is equally likely and as $\theta_1$ increases lower efforts (that give a higher own payoff) are more likely.

To investigate whether distributional concerns guide behavior we consider a second specification that augments SELFISH with a payoff inequality term as an additional explanatory variable:[13]

[13] The general FS model specification allows for different weights to be placed on disadvantageous and advantageous inequality. Estimating a model with separate regressors for disadvantageous and advantageous inequality is problematic due to collinearity of regressors. Thus, in the analysis we use a utility specification with just one term for the payoff

$$U(k) = \theta_1\pi_2 + \theta_2(|\pi_2 - \pi_1| + |\pi_2 - \pi_{ER}|). \qquad \text{[FS]}$$

To investigate whether social norms guide behavior we consider an alternative specification that augments SELFISH with the average norm rating associated with that action as an additional explanatory variable:

$$U(k) = \theta_1\pi_2 \ + \ \theta_3 N(k). \qquad \text{[NORMS]}$$

Finally, in our most general specification we assume that utility depends on own payoff, payoff inequality, and social appropriateness:

$$U(k) = \theta_1\pi_2 + \theta_2(|\pi_2 - \pi_1| + |\pi_2 - \pi_{ER}|) + \ \theta_3 N(k). \qquad \text{[FS+NORMS]}$$

Since, in order to keep the norm-elicitation task manageable for our raters, we only elicited norms for four contingencies (see Section 3), the regressor N(k) is only available for these four contingencies. Thus, we estimate the models using choice data from the BASELINE treatment for these four contingencies. As in Krupka, Leider and Jiang (2011) we use bootstrapped standard errors for the models containing the average norm ratings.

Table 2 presents the results. In all models the coefficient on own payoff is positive and highly significant, showing that subjects are more likely to choose actions that give higher own payoffs. Augmenting the SELFISH model with either norm ratings or payoff inequality substantially improves explanatory power. The FS specification shows that effort levels that imply larger payoff inequality are chosen significantly less often, whereas the NORMS specification shows that effort levels that are deemed more socially appropriate are chosen more often. When both norm ratings and payoff inequalities are incorporated (FS+NORMS model) the

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inequality associated with a choice, and this requires specifying weights for disadvantageous and advantageous inequality. We report the simplest specification with equal weights on disadvantageous and advantageous inequality. We also estimated the models by forming the inequality term with higher weight placed on disadvantageous inequality relative to advantageous inequality. These estimations give similar results; details available from the authors on request.

coefficient on payoff inequality is still negative and highly significant, but the coefficient on norm ratings is no longer significant.

**Table 2:** Conditional logit regressions of Employee 2 effort in BASELINE

| | SELFISH | FS | NORMS | FS+NORMS |
|---|---|---|---|---|
| Own Payoff ($\theta_1$) | 0.218*** (0.018) | 0.481*** (0.058) | 0.350*** (0.047) [0.035] | 0.479*** (0.065) [0.016] |
| Payoff Inequality ($\theta_2$) | | -0.101*** (0.018) | | -0.101*** (0.021) [0.006] |
| Norm Rating ($\theta_3$) | | | 1.008*** (0.294) [0.245] | -0.023 (0.407) [0.208] |
| Observations | 880 | 880 | 880 | 880 |
| Log Likelihood | -196.326 | -175.281 | -189.892 | -175.279 |

Notes: dependent variable is the chosen action; Standard Errors in parentheses, with bootstrapped standard errors in brackets for the specifications with norm ratings; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3 presents predicted mean effort of Employee 2 based on the conditional logit models.[14] As we discussed in previous sections the two distinctive features of the BASELINE results are the existence of own-wage effects and a peer effect when both employees are paid a high wage. Although own payoff is a highly significant explanatory variable in all four specifications reported in Table 2, the model where utility depends only on own payoff (SELFISH) cannot explain either of these features of the data. The augmented models do explain some of these features, although to different extents. First, the models exhibit a predicted own-wage effect when the co-worker's effort is high. However, the magnitude of the effect is much milder in NORMS than in either the actual data or the specifications including payoff inequality, and in fact for this

[14] That is, we calculate mean effort for each contingency using the estimates in Table 2 to compute predicted relative frequencies of each effort level.

model the relevant prediction intervals overlap.[15] Second, the peer effect when both employees receive a high wage is exhibited in the predicted efforts of all augmented models. However, again, the effect is milder in NORMS, and again, the relevant prediction intervals in NORMS overlap. Overall, the conditional logit results suggest that the social preferences model offers a parsimonious explanation of the behavioral regularities observed in the BASELINE setting.

**Table 3:** Average and predicted mean effort for Employee 2 in BASELINE

| | own wage = 16<br>co-worker effort = 1 | own wage = 16<br>co-worker effort = 4 | own wage = 32<br>co-worker effort = 1 | own wage = 32<br>co-worker effort = 4 |
|---|---|---|---|---|
| **Average effort** | **1.163** | **1.163** | **1.418** | **2.073** |
| SELFISH | 1.454<br>[1.356, 1.553] | 1.454<br>[1.356, 1.553] | 1.454<br>[1.356, 1.553] | 1.454<br>[1.356, 1.553] |
| FS | 1.307<br>[1.210, 1.404] | 1.172<br>[1.122, 1.221] | 1.312<br>[1.213, 1.412] | 2.027<br>[1.753, 2.302] |
| NORMS | 1.317<br>[1.218, 1.415] | 1.469<br>[1.395, 1.544] | 1.412<br>[1.316, 1.507] | 1.620<br>[1.450, 1.790] |
| FS + NORMS | 1.309<br>[1.183, 1.435] | 1.169<br>[1.076, 1.263] | 1.313<br>[1.212, 1.413] | 2.027<br>[1.752, 2.302] |

Notes: Employee 1 wage is 32 in all cases. 95% prediction interval in brackets.

## 5. Disentangling Social Preferences and Social Norms: Two Further Treatments

The results from the BASELINE game suggest that the peer effects and pro-social behavior observed in our trilateral gift-exchange game can be explained by the social preferences approach. In this section we put this conclusion to a stress test by introducing two further treatments, ASYMMETRIC and RANDOM, where we modify the BASELINE game so as to

[15] Note, however, that the augmented models predict only a mild own-wage effect when the co-worker chooses minimal effort, and in fact the associated prediction intervals overlap. This appears to be because all models over-predict effort for the contingency where own wage is low and co-worker's effort is low.

manipulate the social preferences predictions of peer effects. Since these manipulations may also affect norms we conduct new norms-elicitation experiments for these treatments.[16]

In the ASYMMETRIC treatment we recruited 153 new subjects to play the same game used in BASELINE except that, while the Employer can still choose a wage of 16 or 32 for Employee 1, the wage the Employer pays to Employee 2 can be either 16 or 30. Thus, in the wage combination where both wages are high Employee 1 is paid a wage of 32 and Employee 2 a slightly lower wage of 30.

In the RANDOM treatment we also recruited 153 new subjects to play the game used in BASELINE except that, after all members of the firm have made their decisions, one of the two employees is randomly selected with equal probability. Only the wage and effort decisions regarding the selected employee are implemented. In RANDOM the payoff functions (1) and (2) above are then modified such that the Employer's earnings are computed as:[17]

$$\pi_{ER} = \begin{cases} 20 + 10 \cdot (e_1) - w_1 & \text{if Employee 1 is selected} \\ 20 + 10 \cdot (e_2) - w_2 & \text{if Employee 2 is selected} \end{cases} \qquad (1')$$

and employee $i$'s earnings are computed as:

$$\pi_i = \begin{cases} w_i - 5 \cdot (e_i - 1) & \text{if Employee } i \text{ is selected} \\ 0 & \text{if Employee } i \text{ is not selected} \end{cases} \qquad (2')$$

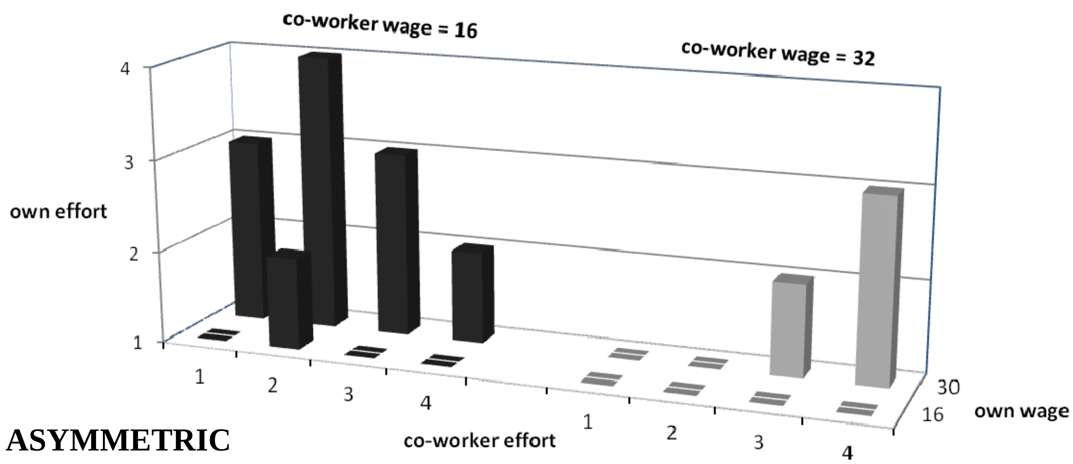
[16] These additional treatments use the same subject pool, recruitment and experimental procedures as for the 2009 BASELINE sessions and the BASELINE norms-elicitation session. Details can be found in the Online Appendix.

[17] Note that a constant is added to the Employer's payoff in RANDOM. As explained in detail in the next sub-section, this is done to refine our theoretical predictions for the RANDOM treatment.

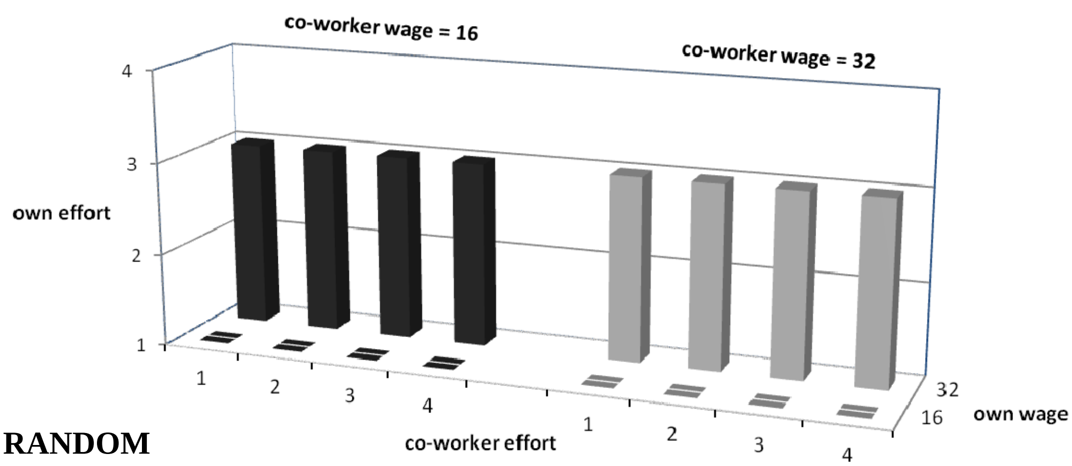
*5.1. Explaining Peer Effects in ASYMMETRIC and RANDOM*

What are the implications of these manipulations for the social preferences predictions of peer effects? As in BASELINE, the FS model predicts minimal effort if $\beta_2 < 1/2$. Otherwise, if $\beta_2 \geq 1/2$, Employee 2 may choose non-minimal effort; see Figure 4.

**Figure 4:** FS prediction of Employee 2 effort for ASYMMETRIC & RANDOM




**ASYMMETRIC**




**RANDOM**

Notes: Predicted Employee 2 effort choices for $\beta_2 \geq 1/2$. For ASYMMETRIC the exact prediction depends also on $\alpha_2$. The figure displays predicted effort for $1/2 \leq \beta_2 \leq 10/19 + 1/19\,\alpha_2$. The predictions for other cases are similar and are reproduced in the Online Appendix. In particular, for all cases there is a positive correlation between employees' effort in the high wages combination.

Relative to the BASELINE game, the small perturbation in Employee 2's high wage in ASYMMETRIC, weakens, but does not eliminate, the peer effect predicted by the FS model in the wage combination where both employees receive a high wage. On the other hand, in the RANDOM treatment the FS model yields dramatically different predictions relative to BASELINE: while the FS model still predicts a positive own-wage effect, it predicts *no* relation between employees' efforts. Intuitively, in the RANDOM treatment the decision of Employee 2 can only affect earnings and the distribution of earnings in the state of the world where she is selected. In this state of the world the co-worker's effort and wage have no impact on earnings or the distribution of earnings, and hence cannot affect the choices of an individual with FS preferences.[18]

These modifications to the BASELINE setting may also affect social norms. For example, the small wage asymmetries introduced in ASYMMETRIC may affect norm compliance due to the existence of 'moral wiggle' opportunities (Dana, Weber and Kuang (2007)) that may weaken or eliminate the descriptive norm regulating the relationship between employees' efforts. The reason is that employees are now in different situations and what one employee does may no longer provide a relevant benchmark for what is appropriate behavior by the other.[19] To elicit

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[18] The prediction of no correlation between employees' efforts in RANDOM is robust across models of social preferences where utilities are defined over outcomes. However, if utilities are defined over expected outcomes, as in Trautmann (2009), employees' efforts may be correlated. In order to exclude this possibility we added 20 points to the Employer's payoff such that Employee 2 is worse off than the Employer in expectation and thus is generally unwilling to supply effort above the minimal level.

[19] Dana et al. (2007) discuss the existence of moral wriggle room across variants of the dictator game. For other studies providing evidence of exploitation of moral wriggle room possibilities see Haisley and Weber (2010), Xiao and Bicchieri (2010)) and Thöni and Gächter (2011). Also related are the studies on exit options in dictator games by Dana, Cain and Dawes (2006); Broberg, Ellingsen and Johannesson (2007); and Lazear, Malmendier and Weber (2012). Other related studies also point to the existence of a *self-serving* or *egocentric bias* when one's self-interest is

social norms in the two new treatments, we conducted two further norms-elicitation experiments using the same procedures used for the norms-elicitation experiment described in Section 3. We recruited 93 new subjects who were given a description of four situations reproducing four of the sixteen possible contingencies faced by Employees 2 either in the ASYMMETRIC (46 subjects) or in the RANDOM (47 subjects) treatment. The situations corresponded to those used in the norms-elicitation experiment for the BASELINE game.

Table 4 shows the results of the norms-elicitation experiments. For each situation, the Table shows the average social appropriateness rating of the effort choices available to Employee 2. As in BASELINE, low effort receives a higher appropriateness rating when Employee 2 receives a low wage (i.e. in Situations 1 and 2) than when Employee 2 receives a high wage (i.e. in Situations 3 and 4). In contrast high effort receives a higher appropriateness rating when the own wage is high rather than low.[20] Also as in BASELINE, the co-worker's effort systematically affects appropriateness ratings when both employees receive a high wage: low effort is generally deemed more appropriate when the co-worker chooses low effort (Situation 3) than when the co-worker chooses high effort (Situation 4), while high effort is deemed more appropriate when the co-worker chooses high effort than when she chooses low effort.[21]

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at stake: see Konow (2005) for an overview and related literature. In the context of the gift exchange game, see Charness and Haruvy (2000).

[20] According to two-sided Wilcoxon signed-rank tests the differences in ratings between Situation 1 and 3 are only significant in RANDOM ($p \leq 0.001$ for each possible effort choice). The differences between Situation 2 and 4 are highly significant in both treatments for effort equals 1, 2, or 4 ($p < 0.001$), but not for effort equals 3: $p = 0.180$ in ASYMMETRIC; $p = 0.105$ in RANDOM).

[21] According to two-sided Wilcoxon signed-rank tests, the differences in ratings between Situation 3 and 4 are significant for each possible effort choice, both in ASYMMETRIC ($p \leq 0.005$) and RANDOM ($p \leq 0.031$).

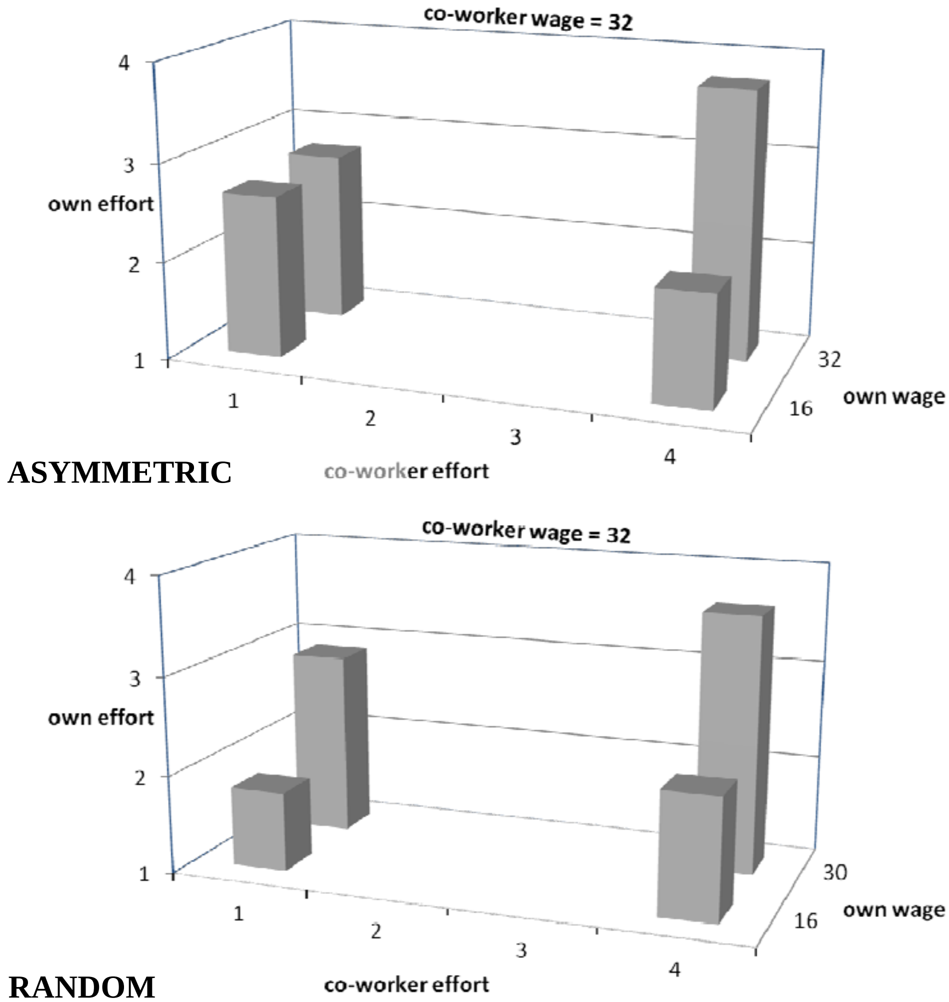
**Table 4:** Elicited norms – ASYMMETRIC & RANDOM

| ASYMMETRIC | | | | |
|---|---|---|---|---|
| Employee 2 effort | Situation 1 ($w_1$=32; $w_2$=16; $e_1$=1) | Situation 2 ($w_1$=32; $w_2$=16; $e_1$=4) | Situation 3 ($w_1$=32; $w_2$=30; $e_1$=1) | Situation 4 ($w_1$=32; $w_2$=30; $e_1$=4) |
| 1 | 0.98 *(1.18)* | 1.15 *(1.03)* | 0.98 *(1.26)* | 0.26 *(0.57)* |
| 2 | 1.43 *(0.69)* | 2.28 *(0.65)* | 1.39 *(0.74)* | 1.00 *(0.52)* |
| 3 | 1.67 *(0.67)* | 1.78 *(0.76)* | 1.63 *(0.71)* | 1.98 *(0.54)* |
| 4 | 1.63 *(1.32)* | 0.93 *(1.04)* | 1.65 *(1.21)* | 2.74 *(0.68)* |
| RANDOM | | | | |
| Employee 2 effort | Situation 1 ($w_1$=32; $w_2$=16; $e_1$=1) | Situation 2 ($w_1$=32; $w_2$=16; $e_1$=4) | Situation 3 ($w_1$=32; $w_2$=32; $e_1$=1) | Situation 4 ($w_1$=32; $w_2$=32; $e_1$=4) |
| 1 | 1.96 *(1.08)* | 1.38 *(1.01)* | 0.77 *(1.07)* | 0.25 *(0.71)* |
| 2 | 2.02 *(0.74)* | 2.19 *(0.88)* | 1.53 *(0.69)* | 1.02 *(0.57)* |
| 3 | 1.42 *(0.77)* | 1.62 *(0.78)* | 2.11 *(0.73)* | 1.87 *(0.57)* |
| 4 | 0.87 *(1.26)* | 1.06 *(1.31)* | 2.00 *(1.14)* | 2.70 *(0.69)* |

Notes: Subjects' appropriateness ratings were converted into numerical scores using the following scale: very socially inappropriate = 0; somewhat socially inappropriate = 1; somewhat socially appropriate = 2; very socially appropriate = 3. Standard deviations in parentheses.

Figure 5 shows the implications of our elicited norms for the ASYMMETRIC and RANDOM treatments, using the same approach as that for the BASELINE game described in Section 3. That is, we examine the efforts that our raters would expend if, in each situation, they chose the effort they deemed to be most socially appropriate.

**Figure 5:** Socially most appropriate effort choices in ASYMMETRIC & RANDOM




Notes: Effort choices that the raters would make on average if they chose the most socially appropriate effort level in the four situations they evaluated.

As in the BASELINE game, our norm-elicitation experiments reveal a reciprocity norm: the average effort increases with own wage.[22] Also as in the BASELINE game, our norm-elicitation experiments reveal a peer effect in that effort depends positively on the co-worker's effort when the own wage is high. In ASYMMETRIC, when the co-worker's effort increases

[22] The exception to this is when the co-worker's effort is low in the ASYMMETRIC treatment. In this case the difference in average efforts is not significant (two-sided Wilcoxon signed-rank test: $p = 0.382$). The own-wage effect is highly significant in RANDOM when the co-worker's effort is low, and in either treatment when the co-worker's effort is high ($p < 0.001$).

from 1 to 4 units, average effort increases by 1 unit (from 2.74 to 3.74, two-sided Wilcoxon signed-rank test: $p < 0.001$). In RANDOM, the corresponding increase in average effort is 0.75 units (from 2.87 to 3.62, two-sided Wilcoxon signed-rank test: $p < 0.001$). The strength of these peer effects is not different from that inferred from most socially appropriate behavior in BASELINE (where average effort increases by 0.90 units) in either ASYMMETRIC ($p = 0.724$) or RANDOM ($p = 0.511$) according to two-sided Wilcoxon rank-sum tests. The comparison between BASELINE and ASYMMETRIC is particularly interesting since it shows that the elicited norms do not capture a 'moral wiggle-room' effect.

*5.2. Behavioral data*

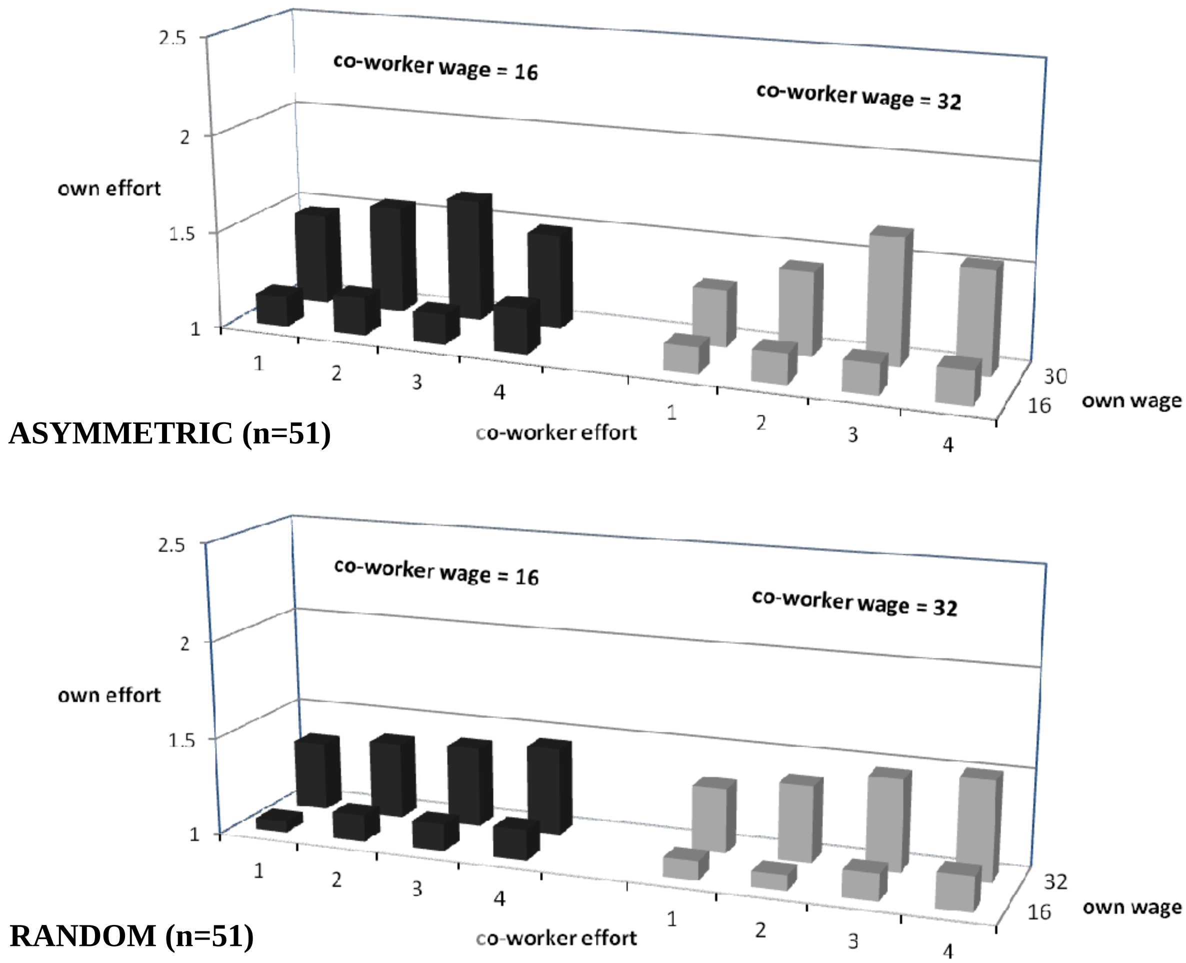
We turn now to the actual effort choices of Employees 2 in the ASYMMETRIC and RANDOM treatments. Figure 6 shows the average effort choices for each contingency.

As in BASELINE, there are clear own-wage effects in the ASYMMETRIC and RANDOM treatments. In each of these treatments, Employee 2's effort when the own wage is high is significantly higher than when the own wage is low, across all eight cases shown in both panels of Figure 6 ($p \leq 0.038$ according to two-sided Wilcoxon signed-rank tests). Note, however, that in general efforts tend to be lower than in BASELINE. In fact, the fraction of Employees 2 who behave 'non-selfishly' (i.e. who make at least one non-minimal effort choice) is significantly lower in RANDOM than in BASELINE (29% vs. 60%, $\chi^2(1) = 9.99$, $p = 0.002$).[23] The higher proportion of Employees 2 choosing minimal effort in RANDOM relative to BASELINE is difficult to reconcile with the FS model, as the threshold value of the superiority aversion parameter $\beta_2$ by which Employees 2 are predicted to expend non-minimal effort is the same in

[23] The fraction of 'non-selfish' Employees 2 in ASYMMETRIC is instead not different than in BASELINE (49%, $\chi^2(1) = 1.288$, $p = 0.256$).

both treatments. A possible explanation is that individuals may dislike inequality in expected outcomes, as in Trautmann (2009). In RANDOM these individuals are predicted to choose minimal effort most of the time, and this may explain a higher fraction of minimal effort choices in RANDOM.

**Figure 6:** Employee 2 average effort – ASYMMETRIC & RANDOM




Turning to peer effects, Figure 6 shows that in ASYMMETRIC Employee 2's effort tends to increase, albeit non-monotonically, with the co-worker's effort. A one-tailed Page test for ordered alternatives shows that this positive correlation is statistically significant ($p = 0.033$). Nevertheless, the observed peer effect appears weaker than in BASELINE: focusing on the extreme cases where both wages are high and the co-worker's effort increases from 1 to 4 units, Employee 2's effort increases by 0.24 units in ASYMMETRIC (from 1.29 to 1.53). The corresponding average effort increase in BASELINE is 0.65. The apparently weaker peer effect in ASYMMETRIC compared to BASELINE is consistent with the predictions of the social preferences model or a moral wiggle-room effect (although recall that, somewhat surprisingly, the elicited norms did not capture any moral wiggle-room effect). However, the difference between the strength of peer effects in ASYMMETRIC and BASELINE is just insignificant according to a two-sided Wilcoxon rank-sum test: p = 0.108.

In the RANDOM treatment Employee 2's effort slightly increases as the co-worker expends higher effort: again focusing on the cases where the co-worker's effort increases from 1 to 4 units, Employee 2's effort increases by 0.18 units (from 1.33 to 1.51). This peer effect is *not* significant according to a one-tailed Page test for ordered alternatives (p = 0.198).[24] The absence of a peer effect in RANDOM is consistent with the social preferences model.

To examine formally the explanatory power of the social preferences model vis-à-vis the social norms approach, we apply the conditional logit models introduced in Section 4 to the choice data from ASYMMETRIC and RANDOM.[25] Table 5 presents the results.

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[24] The strength of the peer effect in RANDOM is significantly different from BASELINE according to a two-sided Wilcoxon rank-sum test: p = 0.011. In fact, in RANDOM only four out of fifty-one Employees 2 monotonically increase effort when the co-worker chooses higher effort in the high wages combination. By comparison, in BASELINE nineteen out of fifty-five Employees 2 monotonically increase their effort with the co-worker's effort in the high wages combination. This difference in proportions is highly significant ($\chi^2(1) = 11.10$, p = 0.001).

[25] As in BASELINE, we have only elicited norms ratings in ASYMMETRIC and RANDOM for four of the possible contingencies available to Employee 2, and we therefore estimate the conditional logit models only using data from these contingencies. For RANDOM we use expected own payoffs and expected inequality in payoffs as regressors.

**Table 5:** Conditional logit regressions of Employee 2 effort in ASYMMETRIC & RANDOM

| **ASYMMETRIC** | SELFISH | FS | NORMS | FS+NORMS |
|---|---|---|---|---|
| Own Payoff ($\theta_1$) | 0.296*** (0.024) | 0.408*** (0.061) | 0.327*** (0.048) [0.019] | 0.389*** (0.066) [0.025] |
| Payoff Inequality ($\theta_2$) | | -0.049** (0.022) | | -0.058*** (0.026) [0.006] |
| Norm Rating ($\theta_3$) | | | 0.297 (0.372) [0.193] | -0.366 (0.495) [0.284] |
| Observations | 816 | 816 | 816 | 816 |
| Log Likelihood | -137.985 | -134.677 | -137.660 | -134.398 |
| **RANDOM** | SELFISH | FS | NORMS | FS+NORMS |
| Own Payoff ($\theta_1$) | 0.597*** (0.049) | 0.686*** (0.067) | 0.711*** (0.091) [0.041] | 0.669*** (0.092) [0.044] |
| Payoff Inequality ($\theta_2$) | | -0.054*** (0.021) | | -0.060*** (0.031) [0.016] |
| Norm Rating ($\theta_3$) | | | 0.587*** (0.343) [0.200] | -0.130 (0.515) [0.342] |
| Observations | 816 | 816 | 816 | 816 |
| Log Likelihood | -136.499 | -132.732 | -134.773 | -132.700 |

Notes: dependent variable is the chosen action; Standard Errors in parentheses, with bootstrapped standard errors in brackets for the specifications with norm ratings; *** p<0.01, ** p<0.05, * p<0.1.

As in BASELINE, the own payoff variable is positive and highly significant in both treatments, confirming the importance of own payoff considerations for Employee 2 effort decisions. Also as in BASELINE, adding a payoff inequality regressor improves explanatory power in both treatments. Turning to the NORMS specification, the coefficient on norms rating is positive and highly significant in RANDOM, but is not significant in ASYMMETRIC. In the most general FS+NORMS specification the coefficient on payoff inequality is negative and highly significant in both treatments while the norms rating coefficient has the ‘wrong’ sign and is statistically insignificant in both treatments.

These results mirror our findings from BASELINE, and show that, for each of our settings choice behavior can be explained parsimoniously by the social preferences model. Note, however, that the magnitude of coefficient estimates changes across treatments in all specifications. Compare for example the BASELINE and RANDOM results for the FS specification. The coefficient on payoff inequality in RANDOM is roughly half that of BASELINE, while the coefficient on own payoff is about one and a half times greater in RANDOM than BASELINE. This reflects the greater proportion of selfish choices in the RANDOM treatment noted earlier. For a formal test of parameter stability across treatments we estimated conditional logit models using data from all treatments, comparing models that restrict parameters to be the same across treatments with unrestricted models allowing parameters to vary.[26] We reject easily the hypothesis that model parameters are invariant to treatment ($p < 0.001$ for all specifications, based on likelihood-ratio tests).

Table 6 presents predicted mean effort of Employee 2 from the conditional logit models for the ASYMMETRIC and RANDOM treatments. The predicted efforts bear out the results of non-parametric statistical tests for some specifications but not others. First, non-parametric tests detect clear own-wage effects in both treatments, but models that do not include a term for payoff inequality (i.e. SELFISH and NORMS) either do not predict own-wage effects or the relevant prediction intervals overlap. The FS+NORMS specification does show a clear own-wage effect in one case (the ASYMMETRIC treatment when the co-worker's effort is 4), while the FS specification shows clear own-wage effects in both treatments when the co-worker chooses high effort and in the RANDOM treatment when the co-worker chooses low effort. Second, non-parametric tests detect a peer effect in the high wage combination of the ASYMMETRIC

[26] See Appendix for details on the regressions output.

treatment. In all specifications except SELFISH, where the predicted efforts are necessarily constant across situations, predicted effort in the high wage combination of ASYMMETRIC is higher when the co-worker chooses high effort than when the co-worker chooses low effort. However, for all three specifications, the associated prediction intervals overlap. This is perhaps consistent with our earlier observation that the peer effect in ASYMMETRIC is weaker than in BASELINE.[27]

[27] This might also reflect the fact that the conditional logit regressions use less data than the non-parametric tests. The peer effect in ASYMMETRIC, significant at the 5% level according to a one-sided Page test, compares effort choices across contingencies where the co-worker chooses 1, 2, 3 or 4 units of effort, while the conditional logit regressions only use the data from the contingencies where the co-worker's effort is 1 or 4. It is possible to estimate the FS conditional logit model using all the choice data, in which case the estimated peer effect is weaker but the standard errors are smaller implying that the prediction intervals do not overlap (the prediction interval when the co-worker chooses effort 1 is $1.313 \pm 0.046$, while the prediction interval when co-worker's chooses effort 4 is $1.461 \pm 0.074$).

**Table 6:** Average and predicted mean effort for Employee 2 in ASYMMETRIC & RANDOM

| **ASYMMETRIC** | own wage = 16<br>co-worker effort = 1 | own wage = 16<br>co-worker effort = 4 | own wage = 30<br>co-worker effort = 1 | own wage = 30<br>co-worker effort = 4 |
|---|---|---|---|---|
| **Average effort** | **1.137** | **1.176** | **1.294** | **1.529** |
| SELFISH | 1.284<br>[1.204, 1.364] | 1.284<br>[1.204, 1.364] | 1.284<br>[1.204, 1.364] | 1.284<br>[1.204, 1.364] |
| FS | 1.258<br>[1.175, 1.342] | 1.176<br>[1.110, 1.243] | 1.260<br>[1.176, 1.344] | 1.442<br>[1.261, 1.623] |
| NORMS | 1.268<br>[1.182, 1.354] | 1.290<br>[1.214, 1.366] | 1.266<br>[1.177, 1.354] | 1.314<br>[1.198, 1.429] |
| FS + NORMS | 1.277<br>[1.174, 1.380] | 1.145<br>[1.047, 1.244] | 1.283<br>[1.173, 1.393] | 1.432<br>[1.253, 1.611] |
| **RANDOM** | own wage = 16<br>co-worker effort = 1 | own wage = 16<br>co-worker effort = 4 | own wage = 32<br>co-worker effort = 1 | own wage = 32<br>co-worker effort = 4 |
| **Average effort** | **1.098** | **1.176** | **1.333** | **1.510** |
| SELFISH | 1.279<br>[1.200, 1.358] | 1.279<br>[1.200, 1.358] | 1.279<br>[1.200, 1.358] | 1.279<br>[1.200, 1.358] |
| FS | 1.173<br>[1.089, 1.257] | 1.173<br>[1.089, 1.257] | 1.386<br>[1.258, 1.513] | 1.386<br>[1.258, 1.513] |
| NORMS | 1.188<br>[1.089, 1.286] | 1.267<br>[1.201, 1.333] | 1.314<br>[1.223, 1.405] | 1.349<br>[1.223, 1.474] |
| FS + NORMS | 1.180<br>[1.077, 1.283] | 1.166<br>[1.065, 1.266] | 1.390<br>[1.256, 1.525] | 1.382<br>[1.252, 1.511] |

Notes: Employee 1 wage is 32 in all cases. 95% prediction interval in brackets.

## 6. Discussion & Conclusions

Our study examines whether peer effects in reciprocity are best organized by social norms compliance or by a social preferences model (the Fehr and Schmidt (1999) inequity aversion model, FS). Our data favor the social preferences approach. Although we do find evidence for the empirical relevance of social norms in our experiments, an econometric horse-race reveals that norm compliance does not explain behavior once we control for payoff inequality.

In our analysis we concentrated on inequity aversion as formulated by FS because a theoretical analysis of the three-player gift-exchange game by Thöni and Gächter (2011) revealed that most other standard theories of social preferences (theories that model various distributional preferences and/or intentions) predict either no peer effect (Dufwenberg and Kirchsteiger (2004) and Levine (1998)) or unambiguously negatively-related efforts (Cox, Friedman and Gjerstad (2007); Cox, Friedman and Sadiraj (2008); Bolton and Ockenfels (2000); Falk and Fischbacher (2006)). Two theories are generally consistent with positively as well as negatively related efforts: Charness and Rabin (2002) and FS. However, for our parameters, only the latter predicts a peer effect.[28]

While the FS model gives a reasonable account of the observed patterns of pro-social behavior within each treatment of the experiment, we also observe differences across treatments in the proportion of individuals who engage in pro-social behavior. These differences occur despite the fact that the threshold value of the advantageous inequity parameter by which an employee is predicted to expend non-minimal effort is the same in all treatments, and that subjects are randomly assigned to treatment conditions. Moreover, our conditional logit analysis shows that a stable distribution of preferences parameters is inconsistent with the pooled choice data from our three treatments. These results are more difficult to reconcile with the FS model predictions.[29] As suggested by Thöni and Gächter (2011), newer models that take into account other motives than distributional concerns and/or intentions may be also successful in explaining peer effects in reciprocity: for example, models of conformity (Sliwka (2007)) and social esteem (Bénabou and Tirole (2006); Ellingsen and Johannesson (2008)). While our experiments are not designed to assess the predictive power of models of conformity or social esteem, this seems a promising task for future research.

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[28] The Charness and Rabin (2002) model assumes that Employee 2 directly compares her payoff with Employee 1 payoff when Employee 1 is the least well off firm member. In our setting this does not occur in the wage combination where both wages are high, and so the model does not predict a peer effect for this wage combination. Of course, suitably modified versions of the model may be able to generate predicted peer effects for our game.

[29] Other studies have noticed the limited success of social preference models in predicting when and whether an individual will deviate from self-interest (e.g., Blanco, Engelmann and Normann (2011); Herrmann and Orzen (2008)).

## Appendix: Conditional Logit Models Using Pooled Data from All Treatments

Table A.1 presents the results of conditional logit models that use pooled data from the three treatments of the experiment. The Restricted Models hold the coefficients constant across treatments. The Unrestricted Models allow different coefficients in the different treatments.

**Table A.1:** Conditional logit regressions of Employee 2 effort, pooled data

| **Restricted Models** | SELFISH | FS | NORMS | FS+NORMS |
|---|---|---|---|---|
| Own Payoff | $0.301^{***}$ | $0.502^{***}$ | $0.346^{***}$ | $0.460^{***}$ |
| | (0.015) | (0.034) | (0.024) | (0.034) |
| | | | [0.015] | [0.016] |
| Payoff Inequality | | $-0.086^{***}$ | | $-0.113^{***}$ |
| | | (0.011) | | (0.014) |
| | | | | [0.006] |
| Norm Rating | | | $0.359^{***}$ | $-0.779^{***}$ |
| | | | (0.143) | (0.230) |
| | | | [0.124] | [0.164] |
| Observations | 2512 | 2512 | 2512 | 2512 |
| Log Likelihood | -505.757 | -467.523 | -502.490 | -461.379 |
| **Unrestricted Models** | SELFISH | FS | NORMS | FS+NORMS |
| Own Payoff | $0.218^{***}$ | $0.481^{***}$ | $0.350^{***}$ | $0.479^{***}$ |
| | (0.018) | (0.058) | (0.047) | (0.065) |
| | | | [0.034] | [0.016] |
| Own Payoff * ASYMMETRIC | $0.078^{***}$ | -0.073 | -0.023 | $-0.091^{***}$ |
| | (0.030) | (0.084) | (0.067) | (0.092) |
| | | | [0.040] | [0.028] |
| Own Payoff * RANDOM | $0.379^{***}$ | $0.205^{**}$ | $0.361^{***}$ | $0.190^{***}$ |
| | (0.052) | (0.088) | (0.103) | (0.113) |
| | | | [0.052] | [0.047] |
| Payoff Inequality | | $-0.101^{***}$ | | $-0.101^{***}$ |
| | | (0.018) | | (0.021) |
| | | | | [0.006] |
| Payoff Inequality * ASYMMETRIC | | $0.052^{*}$ | | $0.043^{***}$ |
| | | (0.028) | | (0.033) |
| | | | | [0.008] |
| Payoff Inequality * RANDOM | | $0.047^{*}$ | | $0.042^{**}$ |
| | | (0.027) | | (0.037) |
| | | | | [0.017] |
| Norm Rating | | | $1.008^{***}$ | -0.023 |
| | | | (0.294) | (0.407) |
| | | | [0.241] | [0.204] |
| Norm Rating * ASYMMETRIC | | | $-0.711^{**}$ | -0.343 |
| | | | (0.475) | (0.640) |
| | | | [0.317] | [0.348] |
| Norm Rating * RANDOM | | | -0.421 | -0.107 |
| | | | (0.452) | (0.657) |
| | | | [0.311] | [0.401] |
| Observations | 2512 | 2512 | 2512 | 2512 |
| Log Likelihood | -470.810 | -442.690 | -462.325 | -442.377 |

Notes: dependent variable is the chosen action; Standard Errors in parentheses, with bootstrapped standard errors in brackets for the specifications with norm ratings; $^{***}$ $p<0.01$, $^{**}$ $p<0.05$, $^{*}$ $p<0.1$

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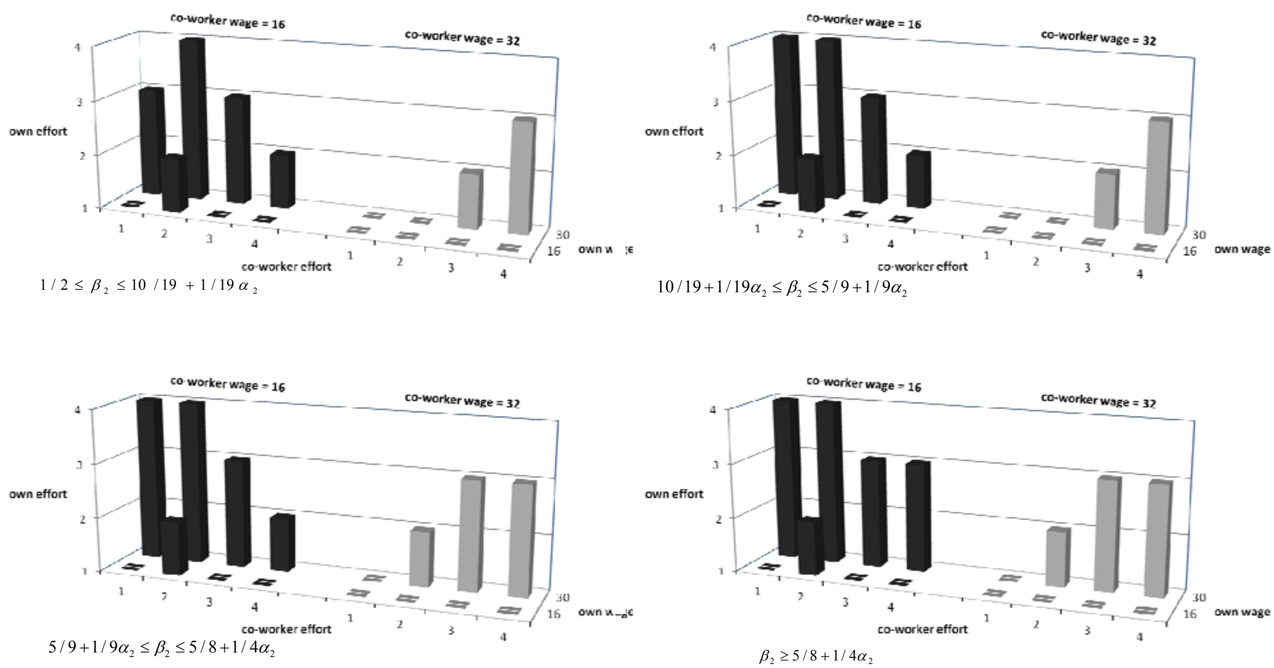
# Online Appendix

Appendix 1 contains the predictions of the Fehr and Schmidt (1999) model in the treatment ASYMMETRIC. Appendix 2 contains instructions and material used in the behavioral experiments, as well as a detailed description of the experimental procedures. Appendix 3 contains the instructions and material used in the norms elicitation experiments.

### Appendix 1: Fehr and Schmidt (1999) predictions in ASYMMETRIC

The predictions of the Fehr and Schmidt (1999) model in the treatment ASYMMETRIC depend on the threshold value of Employee 2's superiority aversion parameter $\beta_2$. There are four possible thresholds of $\beta_2$, illustrated in Figure A, and for all of them a positive correlation between employees' effort emerges in the high wages combination.

**Figure A.1:** FS predictions – ASYMMETRIC treatment



## Appendix 2 - Instructions & Experimental Procedures

Instructions and all material given or read to subjects during the behavioral experiments are reproduced at the end of this Appendix for the BASELINE treatment.

All treatments reported in this paper (BASELINE, ASYMMETRIC and RANDOM) were implemented in two parts. In the first part the relevant experimental game was implemented using the strategy method, while in the second part the same game was played in direct-response mode, i.e. subjects had to make decisions in response to the decisions actually made by other players. In both parts of the experiment we implemented a one-shot version of the relevant game, which was described to subjects using the same labor market frame that we used throughout the paper. At the beginning of the experiment subjects were informed that the experiment consisted of two parts, but detailed information about the second part was only given once everyone had completed the first part. Subjects remained matched with the same participants throughout the whole experiment, and any information about outcomes from the first part of the experiment was only given at the end of the second part. Subjects knew from the beginning that only one randomly determined part of the experiment would be taken into consideration for determining earnings.

The experiments were conducted between November 2009 and January 2012 at the University of Nottingham using a total of 387 subjects (129 firms). For the BASELINE treatment we ran seven sessions, with 9 or 12 participants per session and a total of 81 subjects (27 firms). For the ASYMMETRIC treatment we ran thirteen sessions, with 9 or 12 participants per session and a total of 153 subjects (51 firms). For the RANDOM treatment we ran thirteen sessions, with 9, 12 or 15 participants per session and a total of 153 subjects (51 firms). No subject participated in more than one session.

The experimental sessions lasted 75 minutes on average. All participants were endowed with an initial amount of 95 points in each part of the experiment, and earnings from the decision task (which could be negative) were added to this initial amount. Note, in fact, that subjects in the role of the Employer could incur losses from the decision task. The initial endowment outweighed any possible losses. At the end of the session, the final point earnings were converted into British Pounds at a rate of £0.10 per point. Subjects were paid in private and in cash at the end of each session. Subject earnings ranged from £5.30 to £13.90, averaging £10.41.

The following experimental procedures were observed in all treatments. Upon arrival subjects were given instructions informing them that the experiment consisted of two parts. After these preliminary instructions were read aloud by the experimenter, subjects were given a written set of instructions for Part One of the experiment and they had 15 minutes to read through the instructions. Then, the experimenter read aloud a briefer précis outlining the most important points contained in the instructions.

Part One of the experiment then began with subjects being randomly assigned to a group and a role. All decisions were made anonymously, and neither during nor after the experiment were subjects informed about the identity of the other members of their group. Before proceeding to the decision stage, subjects were guided through two role-specific video presentations which carefully illustrated the main features of the decision screens they were going to use during the experiment.[30] The first video presentation explained the functioning of an on-screen electronic calculator (the *What-if-calculator*) that subjects could use to compute their and other players' payoffs. At the end of the first video presentation, subjects were asked to solve a set of control questions and they could not enter the decision stage unless they had solved all the questions correctly. The second video presentation showed subjects how to enter their choices in a Decision Table and explained once again the structure of the game and the strategy method.

Once everyone in the room had completed their choices for Part One of the experiment, but without revealing any outcomes, instructions for Part Two were distributed. Subjects again read through the instructions on their own before a briefer précis was read aloud. Part Two of the experiment began with a short video presentation showing subjects how to enter choices in the Decision Table and explaining once more the structure of the game. Subjects then proceeded to the decision stage: participants in the role of Employers made their decisions first, while other participants were waiting. After all Employers had made a decision, participants in the role of Employee 1 learned the choices made by the Employer in their group and made an effort decision. Finally, after all Employees 1 had made a decision, participants in the role of Employee 2 learned the choices made by the other members of their group and chose an effort level. Once everyone in the room had made a decision in Part Two of the experiment a computer screen showed subjects the firm members' decisions and their own earnings from the two parts of the experiment. A coin was then tossed to determine whether all participants in the session were paid according to earnings from Part One or Part Two.

### Preliminary Instructions (common to all treatments)

Welcome!

You are about to take part in a decision-making experiment. It is important that you do not talk to any of the other participants until the experiment is over. If you have a question at any time, raise your hand and a monitor will come to your desk to answer it.

This experiment consists of two parts: PART 1 and PART 2.

In each part of the experiment you will be asked to make one or more decisions. Decisions that will be made in one part of the experiment will not affect decisions or earnings in the other part of the experiment.

You will be informed of any outcome (including your earnings) from PART 1 and PART 2 of the experiment only once everyone in the room has completed PART 2 of the experiment. Therefore everyone will make their decisions in PART 2 of the experiment without knowing any outcome from PART 1 of the experiment.

Only one part of the experiment will be taken into account in determining your final earnings from today's experiment. At the end of PART 2 of the experiment, we will toss a fair coin. If the coin lands heads all participants in today's experiment will be paid according to their earnings from PART 1 of the experiment. If the coin lands tails all participants in today's experiment will be paid according to their earnings from PART 2 of the experiment.

Your earnings will then be paid out to you in private and in cash.

Shortly, you will receive detailed instructions about PART 1 of the experiment. You will receive detailed instructions about PART 2 of the experiment once everyone in the room has completed PART 1 of the experiment.

[30] Video presentations were shown to subjects individually in z-Tree. Video presentations and the software are available upon request.

## Instructions for PART 1 (BASELINE)

In PART 1 of the experiment your earnings will be calculated in points. You will receive an initial endowment of 95 points, which will be enough to cover any loss that might occur during PART 1. The points you lose will be subtracted from your endowment.

At the end of the experiment we will convert your point earnings from PART 1 of the experiment into money at the following rate:

1 Point = 10 Pence

If PART 1 of the experiment will be selected for payment, your total money earnings from PART 1 will be paid out to you in private and in cash at the end of the experiment.

**1. Introduction**

In PART 1 of the experiment you will be randomly matched with two other participants to form a group of three persons. We will refer to each group as a **firm**, and to the three group members as **Employer**, **Employee 1** and **Employee 2**. You will be assigned to a firm and a role entirely at random, and the computer will inform you of your role before the decision-making phase of PART 1 begins. You will not be informed about who of the other participants are in your firm, either during or after the experiment. Therefore, all decisions are made anonymously.

**2. Decisions within a firm**

The structure of the decision-making within each firm is as follows.

- ✓ First, **the Employer** chooses the wages to pay to Employee 1 (**$Wage_1$**) and Employee 2 (**$Wage_2$**). The Employer can choose among four possible wage combinations:
  - o The Employer can choose to pay $Wage_1$=16 and $Wage_2$=16.
  - o The Employer can choose to pay $Wage_1$=16 and $Wage_2$=32.
  - o The Employer can choose to pay $Wage_1$=32 and $Wage_2$=16.
  - o The Employer can choose to pay $Wage_1$=32 and $Wage_2$=32.
- ✓ Next, **Employee 1** learns the wage combination chosen by the Employer, and then chooses an effort level (**$Effort_1$**), either 1, 2, 3 or 4.
- ✓ Finally, **Employee 2** learns the wage combination chosen by the Employer, and also the effort decision of Employee 1. Employee 2 then chooses an effort level (**$Effort_2$**), either 1, 2, 3 or 4.

**3. Distribution of earnings within a firm**

Earnings within the firm are determined according to the following rules:

**Employer**

The Employer receives revenue from the effort chosen by the two Employees, and incurs costs from the wages paid to the two Employees. The revenue produced by each Employee equals 10 times the effort he or she chooses. The costs are simply the sum of the two wages the Employer pays to the Employees. The Employer's earnings are therefore:

$$\boxed{\textbf{Employer's Earnings} = 10 * (Effort_1 + Effort_2) - Wage_1 - Wage_2}$$

The Employer's earnings increase with higher effort levels. The higher the wages the Employer pays to the two Employees, the lower are the Employer's earnings. Note that the Employer's earnings could be negative.

**Employee 1**

Employee 1 receives the wage from the Employer as revenue, and may incur an effort cost. The minimum effort choice of 1 is costless. Each additional unit of effort costs 5 points to the Employee. Therefore the effort cost is calculated as: 5 * (Effort – 1). The earnings of Employee 1 are therefore:

**Employee 1's Earnings = $Wage_1 – 5 * (Effort_1 – 1)$**

The earnings of Employee 1 only depend on his or her own wage and effort. The higher the wage, the higher are the earnings. The higher the effort he or she chooses, the lower are the earnings.

**Employee 2**

The earnings of Employee 2 are calculated in the same way as those of Employee 1, except, of course, that Employee 2's earnings depend on his or her own wage ($Wage_2$) and his or her own effort choice ($Effort_2$):

**Employee 2's Earnings = $Wage_2 – 5 * (Effort_2 – 1)$**

**HYPOTHETICAL EXAMPLE FOR DEMONSTRATION PURPOSES**

ASSUME THAT THE EMPLOYER CHOOSES THE FOLLOWING WAGES FOR HIS OR HER EMPLOYEES:

WAGE FOR EMPLOYEE 1 = 32

WAGE FOR EMPLOYEE 2 = 16

THE EMPLOYEES CHOOSE THE FOLLOWING EFFORT:

EFFORT EMPLOYEE 1 = 2

EFFORT EMPLOYEE 2 = 3

THIS SITUATION RESULTS IN THE FOLLOWING EARNINGS:

**EMPLOYER'S EARNINGS**: THE EMPLOYER RECEIVES REVENUE FROM THE EFFORT OF THE TWO EMPLOYEES, I.E.: 10*(2 + 3) = 50. THE EMPLOYER PAYS A TOTAL OF 48 POINTS TO THE EMPLOYEES.

THE EARNINGS OF THE EMPLOYER ARE: 50 – 48 = **2**.

**EMPLOYEE 1'S EARNINGS**: EMPLOYEE 1 RECEIVES A WAGE OF 32. THE EFFORT CHOICE OF 2 HAS A COST OF 5*(2 – 1) = 5.

THE EARNINGS OF EMPLOYEE 1 ARE: 32 – 5 = **27**.

**EMPLOYEE 2'S EARNINGS**: EMPLOYEE 2 RECEIVES A WAGE OF 16. THE EFFORT CHOICE OF 3 HAS A COST OF 5*(3 – 1) = 10.

THE EARNINGS OF EMPLOYEE 2 ARE: 16 – 10 = **6**.

### 4. The Decision Task

Although the structure of the decision-making within each firm is the one described above, in PART 1 of the experiment we ask you to take a decision for each possible situation that may arise. Please note that one of these situations will be actually relevant, so make your choices carefully.

The situations you face when making your decisions will depend on your role.

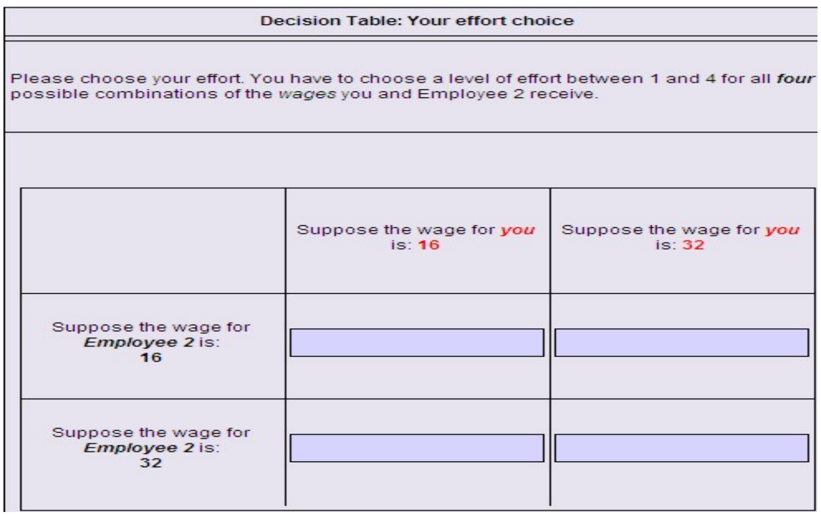
If you are an **Employer you must choose two wage**s, one for each Employee within the firm. You can choose among four possible wage combinations:

- $Wage_1 = 16$ and $Wage_2 = 16$;
- $Wage_1 = 16$ and $Wage_2 = 32$;
- $Wage_1 = 32$ and $Wage_2 = 16$;
- $Wage_1 = 32$ and $Wage_2 = 32$.

Depending on the choice of the Employer one of four situations will arise:

- Employee 1 and Employee 2 could both have a wage of 16;
- Employee 1 could have a wage of 16 while Employee 2 has a wage of 32;
- Employee 1 could have a wage of 32 while Employee 2 has a wage of 16;
- Employee 1 and Employee 2 could both have a wage of 32.

If you are **<u>Employee 1</u>** you will be in one of these four situations. However, before knowing which of these situations you are actually in, you will be asked to **<u>indicate what you would do for each of the four possible situations</u>** you may be in. Your computer screen will contain a Decision Table as the one below:




Each box represents one of the four possible situations you may be in. In each of these boxes, you must enter an effort choice, either 1, 2, 3 or 4. Your actual effort choice will depend on which of these four possible situations will actually realise, i.e. on the wage combination actually chosen by the Employer.

Depending on the choices of the Employer and Employee 1 one of sixteen situations may arise:

- Employer could choose $Wage_1 = 16$ and $Wage_2 = 16$ while Employee 1 chooses 1 unit of effort;
- Employer could choose $Wage_1 = 16$ and $Wage_2 = 16$ while Employee 1 chooses 2 units of effort;
- ….and so on.

If you are **<u>Employee 2</u>** you will be in one of these sixteen situations. However, before knowing which of these situations you are actually in, you will be asked to **<u>indicate what you would do for each of the sixteen possible situations</u>** you may be in. Your computer screen will contain a Decision Table as the one below:

**Decision Table: Your effort choice**

Please choose your effort. You have to choose a level of effort between 1 and 4 for all ***sixteen*** possible combinations of the *wages* you receive and the *wages* and *effort* of Employee 1.

| | Suppose the wage for ***you*** is: 16<br><br>Suppose the wage for ***Employee 1*** is: 16 | Suppose the wage for ***you*** is: 16<br><br>Suppose the wage for ***Employee 1*** is: 32 | Suppose the wage for ***you*** is: 32<br><br>Suppose the wage for ***Employee 1*** is: 16 | Suppose the wage for ***you*** is: 32<br><br>Suppose the wage for ***Employee 1*** is: 32 |
|---|---|---|---|---|
| Suppose ***Employee 1*** chooses effort: **1** | | | | |
| Suppose ***Employee 1*** chooses effort: **2** | | | | |
| Suppose ***Employee 1*** chooses effort: **3** | | | | |
| Suppose ***Employee 1*** chooses effort: **4** | | | | |

Each box represents one of the sixteen possible situations you may be in. In each of these boxes, you must enter an effort choice, either 1, 2, 3 or 4. Your actual effort choice will depend on which of these sixteen possible situations will actually realise, i.e. on the wage combination actually chosen by the Employer and on the effort actually chosen by Employee 1.

More information about how to solve your specific Decision task will be provided to you via computer later on during PART 1 of the experiment, once your role has been determined.

Note that the decision task in PART 1 of the experiment will be performed **only once**.

**5. How do we determine your actual earnings from PART 1 of the experiment?**

Although Employee 1 will take four effort decisions, **only one** will be relevant in determining the earnings of the members of the firm. Similarly, only one of the sixteen effort decisions made by Employee 2 will be actually used in the earnings' computation.

Which decision is actually relevant will be determined at the end of PART 1, once everyone in the firm has taken his or her decisions: the actual wage combination chosen by the Employer will determine which of the four possible situations is relevant for Employee 1. Employee 1's choice in this relevant situation will determine which of the sixteen possible situations is relevant for Employee 2.

You will be informed of your earnings from PART 1 at the end of the experiment.

**6. What happens next?**

I. When the experiment starts you will be informed about whether you are an Employer or an Employee in PART 1 of the experiment. In case you are an Employee, it will be specified whether you are Employee 1 or Employee 2.

II. When you press the "Continue" button, a screen with a brief video-presentation about the main features of the PART 1 of the experiment will appear. In this video-presentation you will receive some information about the "*What-if-calculator*", a tool you can use to facilitate your computations. It is important to note that no other participant will be informed about your calculations and that these calculations do not have any effect on your earnings.

III. After this brief video-presentation, you will access a new screen where you will be asked to answer a few questions. You will have to calculate the earnings of all members of your firm for five hypothetical scenarios, with the help of the "*What-if-calculator*". Press "Check" when you have answered all the questions. You will be informed about whether your answers are correct.

IV. Once you have answered all the questions correctly, you will be guided to a new short video-presentation that will give you specific information about how to enter your decisions into the Decision Table.

V. After that, you will finally enter the Decision Task screen. Depending on whether you are an Employer or an Employee you will have to choose wages or effort levels. In this screen, you will again have the possibility to use the "*What-if-calculator*".

VI. When everyone has made a decision, PART 1 of the experiment will be finished. The experiment will then proceed to PART 2.

Please, raise your hand if you have any questions.

## Script read to subjects in PART 1 (BASELINE)

I will now briefly summarize the content of the instructions you have just read.

At the beginning of PART 1 of the experiment you will be randomly matched with two other participants to form a group of three people and you will be randomly assigned a role within this group, which we will call "firm". You will be either the Employer or Employee 1 or Employee 2.

The structure of the decision-making within each firm is as follows.

First, **the Employer** chooses one wage to pay to Employee 1 (**$Wage_1$**) and one wage to pay to Employee 2 (**$Wage_2$**).

Next, **Employee 1** learns the wages the Employer pays to each Employee, and then chooses an effort level (**$Effort_1$**).

Finally, **Employee 2** learns the wages the Employer pays to each Employee and also the effort decision of Employee 1, and then chooses an effort level (**$Effort_2$**).

The Employer's earnings increase with higher effort levels and decrease with higher wages.

The Employees' earnings increase in the wage they receive and decrease with higher effort. The earnings of each Employee only depend on his or her own wage and effort.

**Although the structure of the decision-making within each firm is the one I have just described, in PART 1 of today's experiment we ask you to take a decision for each possible situation that may arise. This is a crucial point, so make sure you have understood it correctly.**

The possible situations you will face when making your decisions will depend on your role.

If you are an **Employer you must choose two wage**s, one for each Employee within the Firm. Thus, depending on the choice of the Employer one of four situations will arise:

- Both Employees could get a wage of 16;
- Both Employees could get a wage of 32;
- And the two situations where one Employee gets a wage of 16 while the other Employee gets a wage of 32;

If you are **Employee 1** you must indicate an effort choice for each of these four possible situations, before knowing which one you are actually in. Remember, one of these four decisions will be the one that is actually relevant, so make your choice carefully.

Depending on the choices of the Employer and Employee 1 one of sixteen situations may arise:

- Both Employees get a wage of 16 and Employee 1 chooses 1 unit of effort

- Both Employees get a wage of 16 and Employee 1 chooses 2 units of effort;
- ….and so on…

Since there are 4 possible levels of effort and 4 possible wage combinations, 16 situations in all may arise.

If you are **Employee 2** you must indicate an effort choice for each of the sixteen possible situations. Remember, one of these sixteen decisions will be the one that is actually relevant, so make your choice carefully.

Which decision is actually relevant will be determined at the end of PART 1, once everyone in the firm has taken his or her decisions: the actual wage combination chosen by the Employer will determine which of the four possible situations is relevant for Employee 1. Employee 1's choice in this relevant situation will determine which of the sixteen possible situations is relevant for Employee 2.

Please note that the decision task in PART 1 of the experiment will be performed only once.

Please, raise your hand if you have any questions.

## Instructions for PART 2 (BASELINE)

In PART 2 of the experiment your earnings will be calculated in points. You will receive an initial endowment of 95 points, which will be enough to cover any loss that might occur during PART 2. The points you lose will be subtracted from your endowment.

At the end of the experiment we will convert your point earnings from PART 2 of the experiment into money at the following rate:

1 Point = 10 Pence

If PART 2 of the experiment will be selected for payment, your total money earnings from PART 2 will be paid out to you in private and in cash at the end of the experiment.

**1. Introduction**

In PART 2 of the experiment you will be matched with the **same two participants** with whom you have been matched in PART 1. You and the two other participants will again form a group of three persons – a firm - , and you will keep the **same role in the firm** as in PART 1. That is, if you were an Employer in PART 1, you will be assigned the role of Employer also in PART 2. If you were an Employee 1 in PART 1, you will also be assigned the role of Employee 1 in PART 2. If you were an Employee 2 in PART 1, you will also be assigned the role of Employee 2 in PART 2. As before, you will not be informed about who of the other participants are in your firm, either during or after the experiment. Therefore, all decisions are made anonymously.

**2. Decisions within a firm**

The structure of the decision-making within each firm is the same as in PART 1 of the experiment:

- ✓ First, **the Employer** chooses the wages to pay to Employee 1 (**$Wage_1$**) and Employee 2 (**$Wage_2$**). The Employer can choose among four possible wage combinations:
  - The Employer can choose to pay $Wage_1$=16 and $Wage_2$=16.
  - The Employer can choose to pay $Wage_1$=16 and $Wage_2$=32.
  - The Employer can choose to pay $Wage_1$=32 and $Wage_2$=16.
  - The Employer can choose to pay $Wage_1$=32 and $Wage_2$=32.
- ✓ Next, **Employee 1** learns the wage combination chosen by the Employer, and then chooses an effort level (**$Effort_1$**), either 1, 2, 3 or 4.
- ✓ Finally, **Employee 2** learns the wage combination chosen by the Employer, and also the effort decision of Employee 1. Employee 2 then chooses an effort level (**$Effort_2$**), either 1, 2, 3 or 4.

**3. Distribution of earnings within a firm**

Earnings within the firm are determined according to the same rules as in PART 1 of the experiment:

**Employer**

The Employer receives revenue from the effort chosen by the two Employees, and incurs costs from the wages paid to the two Employees. The revenue produced by each Employee equals 10 times the effort he or she chooses. The costs are simply the sum of the two wages the Employer pays to the Employees. The Employer's earnings are therefore:

$$\boxed{\textbf{Employer's Earnings} = 10 * (\text{Effort}_1 + \text{Effort}_2) - \text{Wage}_1 - \text{Wage}_2}$$

The Employer's earnings increase with higher effort levels. The higher the wages the Employer pays to the two Employees, the lower are the Employer's earnings. Note that the Employer's earnings could be negative.

**Employee 1**

Employee 1 receives the wage from the Employer as revenue, and may incur an effort cost. The minimum effort choice of 1 is costless. Each additional unit of effort costs 5 points to the Employee. Therefore the effort cost is calculated as: 5 * (Effort – 1). The earnings of Employee 1 are therefore:

$$\boxed{\textbf{Employee 1's Earnings} = \text{Wage}_1 - 5 * (\text{Effort}_1 - 1)}$$

The earnings of Employee 1 only depend on his or her own wage and effort. The higher the wage, the higher are the earnings. The higher the effort he or she chooses, the lower are the earnings.

**Employee 2**

The earnings of Employee 2 are calculated in the same way as those of Employee 1, except, of course, that Employee 2's earnings depend on his or her own wage ($\text{Wage}_2$) and his or her own effort choice ($\text{Effort}_2$):

$$\boxed{\textbf{Employee 2's Earnings} = \text{Wage}_2 - 5 * (\text{Effort}_2 - 1)}$$

**HYPOTHETICAL EXAMPLE FOR DEMONSTRATION PURPOSES**

ASSUME THAT THE EMPLOYER CHOOSES THE FOLLOWING WAGES FOR HIS OR HER EMPLOYEES:

WAGE FOR EMPLOYEE 1 = 32

WAGE FOR EMPLOYEE 2 = 16

THE EMPLOYEES CHOOSE THE FOLLOWING EFFORT:

EFFORT EMPLOYEE 1 = 2

EFFORT EMPLOYEE 2 = 3

THIS SITUATION RESULTS IN THE FOLLOWING EARNINGS:

**EMPLOYER'S EARNINGS**: THE EMPLOYER RECEIVES REVENUE FROM THE EFFORT OF THE TWO EMPLOYEES, I.E.: 10*(2 + 3) = 50. THE EMPLOYER PAYS A TOTAL OF 48 POINTS TO THE EMPLOYEES.

THE EARNINGS OF THE EMPLOYER ARE: 50 – 48 = **2**.

**EMPLOYEE 1'S EARNINGS**: EMPLOYEE 1 RECEIVES A WAGE OF 32. THE EFFORT CHOICE OF 2 HAS A COST OF 5*(2 – 1) = 5.

THE EARNINGS OF EMPLOYEE 1 ARE: 32 – 5 = **27**.

**EMPLOYEE 2'S EARNINGS**: EMPLOYEE 2 RECEIVES A WAGE OF 16. THE EFFORT CHOICE OF 3 HAS A COST OF 5*(3 – 1) = 10.

THE EARNINGS OF EMPLOYEE 2 ARE: 16 – 10 = **6**.

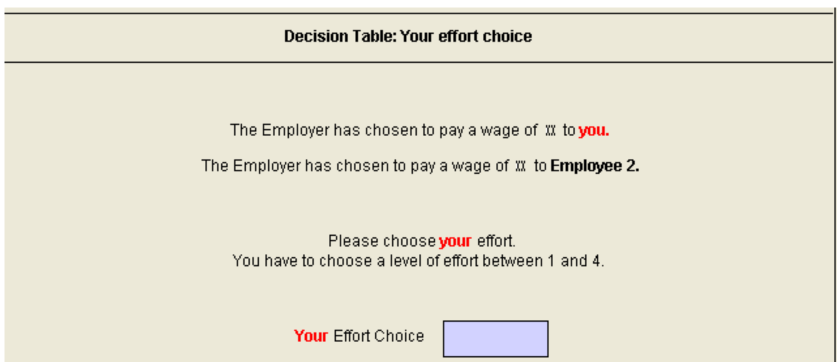
**4. The Decision Task**

Differently from PART 1, in PART 2 of the experiment Employees will be informed of the situation they are in before they make their effort choice. Therefore, in PART 2 of the experiment everyone will take **exactly one decision**:

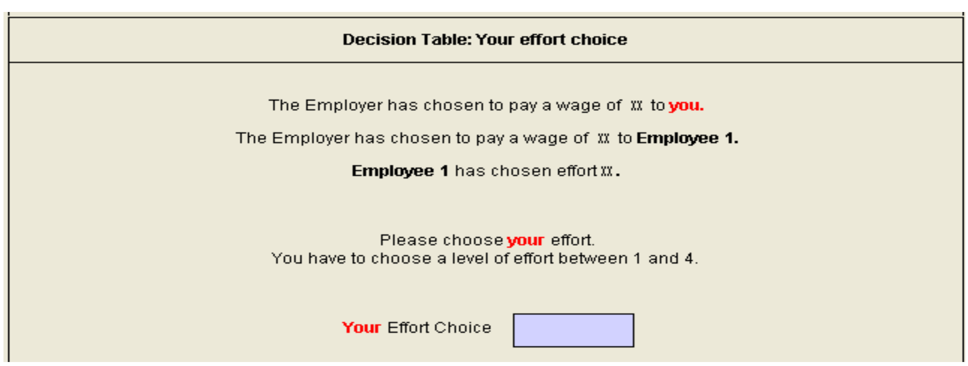
**The Employer will choose a wage combination** among four possible alternatives:

- $Wage_1 = 16$ and $Wage_2 = 16$;
- $Wage_1 = 16$ and $Wage_2 = 32$;
- $Wage_1 = 32$ and $Wage_2 = 16$;
- $Wage_1 = 32$ and $Wage_2 = 32$.

Next, **Employee 1** will be informed of the wage combination the Employer has actually chosen and will then be asked to **choose an effort level for that specific wage combination.** If you are Employee 1, your computer screen will contain a Decision Table as the one below:




Finally, **Employee 2** will be informed of the wage combination the Employer has actually chosen, and of the effort that Employee 1 has actually chosen in that wage combination. Employee 2 will then be asked to **choose an effort level for that specific combination of wages and effort chosen by the Employer and by Employee 1**. If you are Employee 2, your computer screen will contain a Decision Table as the one below:




As in PART 1 of the experiment, PART 2 decision task will be performed **only once**.

**5. How do we determine your actual earnings from PART 2 of the experiment?**

The wage combination chosen by the Employer and Employees' effort choices in that wage combination will translate into earnings according to the rules explained at point 3 above.

**6. What happens next?**

I. PART 2 of the experiment will start with a welcome screen. By pressing the "Continue" button in that screen you will access another screen where you will be shown a brief video-presentation with summary information about your Decision Task in PART 2 of the experiment.

II. You will then enter the Decision Task screen. Depending on whether you are an Employer or an Employee you will have to choose wages or effort levels. In this screen, you will have the possibility to use the "*What-if-calculator*", as in PART 1.

III. When everyone has made a decision, PART 2 of the experiment will be finished. You will then be shown a screen informing of your earnings from PART 1 and PART 2 of the experiment. As explained in the PRELIMINARY INSTRUCTIONS, a coin toss will then determine whether every participant in today's experiment will be paid according to their earnings from PART 1 or PART 2.

Please, raise your hand if you have any questions.

## Script read to subjects in PART 2 (BASELINE)

I will now briefly summarize the content of the instructions you have just read.

In PART 2 of the experiment you are matched with the same two participants with whom you were matched in PART 1. You will also keep the same role in the firm as in PART 1 of the experiment.

The structure of the decision-making within each firm and the rules for determining earnings are the same as in PART 1 of the experiment.

**The only difference between PART 1 and PART 2 of the experiment is the following: while in PART 1 of the experiment Employees had to make their effort decisions before knowing which situation they were in, in PART 2 of the experiment they will learn the situation they are in before making their effort decisions.**

Therefore, in PART 2 of the experiment everyone will take **exactly one decision**:

<u>**Employers will choose a wage combination**</u> among four possible alternatives:

- $Wage_1 = 16$ and $Wage_2 = 16$;
- $Wage_1 = 16$ and $Wage_2 = 32$;
- $Wage_1 = 32$ and $Wage_2 = 16$;
- $Wage_1 = 32$ and $Wage_2 = 32$.

Next, <u>**Employees 1**</u> are informed of the wage combination the Employer has actually chosen and will then be asked to <u>**choose an effort level for that specific wage combination.**</u>

Finally <u>**Employees 2**</u> will be informed of the wage combination the Employer has actually chosen. They will also be informed of the effort that Employee 1 has actually chosen in that wage combination. They will then be asked to <u>**choose an effort level for that specific combination of wages and effort chosen by the Employer and by Employee 1**</u>.

The wage combination chosen by the Employer and Employees' effort choices in that wage combination will determine the firm members' earnings in PART 2 of the experiment.

Once PART 2 will be completed, a coin toss will determine whether everyone in the room will be paid according to PART 1 of the experiment or according to PART 2.

Please note that the decision task in PART 2 of the experiment will also be performed only once.

Please, raise your hand if you have any questions.

## Appendix 3 - Instructions for the norms-elicitation experiment

This Appendix contains the instructions used for the norms-elicitation experiment in BASELINE.

### 1) General Instructions (common to all treatments)

Welcome to the experiment! This is a study on decision making. For your participation, you will be paid a participation fee of £5. In addition, you may receive some additional money based on your choices and the choices of others during the experiment.

If you have any questions during the study, please raise your hand and wait for an experimenter to come to you.

Please do not talk, exclaim, or try to communicate with other participants during the experiment. Participants intentionally violating the rules may be asked to leave the experiment and may not be paid.

In a few minutes you will receive a set of paper sheets containing descriptions of a series of situations. These descriptions correspond to situations in which one person, "Employee 2," must make a decision. For each situation, you will be given a description of the decision faced by Employee 2. This description will include several possible choices available to Employee 2.

After you read the description of the situation, you will be asked to evaluate the different possible choices available to Employee 2 and to decide, for each of the possible choices, whether taking that choice would be "*socially appropriate*" and "*consistent with moral or proper social behavior*" or "*socially inappropriate*" and "*inconsistent with moral or proper social behavior*". By socially appropriate, we mean behavior that most people agree is the "correct" or "ethical" thing to do. Another way to think about what we mean is that if Employee 2 were to select a socially inappropriate choice, then someone else might be angry at Employee 2 for doing so. In each of your responses, we would like you to answer as truthfully as possible, based on your opinions of what constitutes socially appropriate or socially inappropriate behavior.

To give you an idea of how the experiment will proceed, we will go through an example and show you how you will indicate your responses. On the next page you will see an example of a situation.

**Example Situation**

Employee 2 is at a local coffee shop near campus. While there, Employee 2 notices that someone has left a wallet at one of the tables. Employee 2 must decide what to do. Employee 2 has four possible choices: take the wallet, ask others nearby if the wallet belongs to them, leave the wallet where it is, or give the wallet to the shop manager. Employee 2 can choose only one of these four options.

*The table below presents a list of the possible choices available to Employee 2. For each of the choices, please indicate whether you believe choosing that option is very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate, or very socially appropriate. To indicate your response, please place an "x" inside one box for each row.*

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| Take the wallet | | | | |
| Ask others nearby if the wallet belongs to them | | | | |
| Leave the wallet where it is | | | | |
| Give the wallet to the shop manager | | | | |

**Please make sure that you have placed one "x" in each row.**

If this were one of the situations for this study, you would consider each of the possible choices above and, for that choice, indicate the extent to which you believe taking that action would be "*socially appropriate*" and "*consistent with moral or proper social behavior*" or "*socially inappropriate*" and "*inconsistent with moral or proper social behavior*". Recall that by socially appropriate we mean behavior that most people agree is the "correct" or "ethical" thing to do.

For example, suppose you thought that taking the wallet was *very socially inappropriate*, asking others nearby if the wallet belongs to them was *somewhat socially appropriate*, leaving the wallet where it is was *somewhat socially inappropriate*, and giving the wallet to the shop manager was *very socially appropriate*. Then you would indicate your responses as follows:

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| Take the wallet | **X** | | | |
| Ask others nearby if the wallet belongs to them | | | **X** | |
| Leave the wallet where it is | | **X** | | |
| Give the wallet to the shop manager | | | | **X** |

**Are there any questions about this example situation or about how to indicate your responses?**

**Your Task in Today's Experiment**

In a few minutes you will receive a set of paper sheets containing descriptions of four situations, all dealing with decisions that "Employee 2", a participant in an experiment, might have to make. For each situation, you will read a description of the situation and indicate whether each possible choice available to Employee 2 is socially appropriate or socially inappropriate. For each situation, you will indicate your responses using a table similar to the one shown above for the example situation. The experimenter will then collect your responses.

**How Your Cash Earnings Are Determined**

At the end of the experiment today, we will select one of the four situations, by randomly drawing a number from 1 to 4. For this situation, we will also randomly select one of the possible choices that Employee 2 could make. Thus, we will select both a situation and one possible choice at random. For the choice selected, we will determine which response was selected by the most people here today. If you give the same response as that most frequently given by other people, then you will receive an additional £3. This amount will be paid to you, in cash, at the conclusion of the experiment. For instance, if we were to select the example situation above and the possible choice "Leave the wallet where it is" and if your response had been "*somewhat socially inappropriate*" then you would receive £3, in addition to the £5 participation fee, if this was the response selected by most other people in today's session. Otherwise you would receive only the £5 participation fee.

If you have a question at any time, raise your hand and a monitor will come to your desk to answer it.

## 2) General Description of the Decision Task faced by Employee 2 (BASELINE)

All the four situations you will be asked to evaluate deal with decisions that "Employee 2", a participant in an experiment, might have to make in the decision task described below.

In the decision task participants enter choices into a computer and earn points as explained below. All participants start the experiment with an endowment of 95 points, which will be enough to cover any loss that might occur during the experiment. The points lost by a participant during the experiment will be subtracted from that participant's endowment. At the end of the experiment point earnings are converted into cash at a rate of 10p per point.

At the beginning of the decision task, three participants are randomly matched together to form a group of three persons, which we will refer to as a "**firm**". The matching is anonymous, meaning that neither participant will ever know the identity of the other participants with whom he or she is matched. Each participant is then randomly assigned a role within the firm: **Employer**, **Employee 1** or **Employee 2**.

The structure of the decision-making within a firm is as follows:

- First, **the Employer** chooses the wages to pay to Employee 1 (**$Wage_1$**) and Employee 2 (**$Wage_2$**). The Employer can choose among four possible wage combinations:
    - The Employer can choose to pay $Wage_1$=16 and $Wage_2$=16.
    - The Employer can choose to pay $Wage_1$=16 and $Wage_2$=32.
    - The Employer can choose to pay $Wage_1$=32 and $Wage_2$=16.
    - The Employer can choose to pay $Wage_1$=32 and $Wage_2$=32.
- Next, **Employee 1** learns the wage combination chosen by the Employer, and then chooses an effort level (**$Effort_1$**), either 1, 2, 3 or 4.
- Finally, **Employee 2** learns the wage combination chosen by the Employer, and also the effort decision of Employee 1. Employee 2 then chooses an effort level (**$Effort_2$**), either 1, 2, 3 or 4.

Point earnings within a firm are determined according to the following rules:

**Employer**

The Employer receives revenue from the effort chosen by the two Employees, and incurs costs from the wages paid to the two Employees. The revenue produced by each Employee equals 10 times the effort he or she chooses. The costs are simply the sum of the two wages the Employer pays to the Employees. The Employer's earnings are therefore:

$$\boxed{\textbf{Employer's Earnings} = 10 * (Effort_1 + Effort_2) - Wage_1 - Wage_2}$$

The Employer's earnings increase with higher effort levels. The higher the wages the Employer pays to the two Employees, the lower are the Employer's earnings. Note that the Employer's earnings could be negative.

**Employee 1**

Employee 1 receives the wage from the Employer as revenue, and may incur an effort cost. The minimum effort choice of 1 is costless. Each additional unit of effort costs 5 points to the Employee. Therefore the effort cost is calculated as: 5 * (Effort – 1). The earnings of Employee 1 are therefore:

$$\boxed{\textbf{Employee 1's Earnings} = Wage_1 - 5 * (Effort_1 - 1)}$$

The earnings of Employee 1 only depend on his or her own wage and effort. The higher the wage, the higher are the earnings. The higher the effort he or she chooses, the lower are the earnings.

**Employee 2**

The earnings of Employee 2 are calculated in the same way as those of Employee 1, except, of course, that Employee 2's earnings depend on his or her own wage ($Wage_2$) and his or her own effort choice ($Effort_2$):

$$\boxed{\textbf{Employee 2's Earnings} = Wage_2 - 5 * (Effort_2 - 1)}$$

**HYPOTHETICAL EXAMPLE FOR DEMONSTRATION PURPOSES**

ASSUME THAT THE EMPLOYER CHOOSES THE FOLLOWING WAGES FOR HIS OR HER EMPLOYEES:

WAGE FOR EMPLOYEE 1 = 16

WAGE FOR EMPLOYEE 2 = 32

THE EMPLOYEES CHOOSE THE FOLLOWING EFFORT:

EFFORT EMPLOYEE 1 = 2

EFFORT EMPLOYEE 2 = 3

THIS SITUATION RESULTS IN THE FOLLOWING EARNINGS:

**EMPLOYER'S EARNINGS**: THE EMPLOYER RECEIVES REVENUE FROM THE EFFORT OF THE TWO EMPLOYEES, I.E.: 10*(2 + 3) = 50. THE EMPLOYER PAYS A TOTAL OF 48 POINTS TO THE EMPLOYEES.

THE EARNINGS OF THE EMPLOYER ARE: 50 – 48 = **2**.

**EMPLOYEE 1'S EARNINGS**: EMPLOYEE 1 RECEIVES A WAGE OF 16. THE EFFORT CHOICE OF 2 HAS A COST OF 5*(2 – 1) = 5.

THE EARNINGS OF EMPLOYEE 1 ARE: 16 – 5 = **11**.

**EMPLOYEE 2'S EARNINGS**: EMPLOYEE 2 RECEIVES A WAGE OF 32. THE EFFORT CHOICE OF 3 HAS A COST OF 5*(3 – 1) = 10.

THE EARNINGS OF EMPLOYEE 2 ARE: 32 – 10 = **22**.

After everyone in the firm has made a decision, all three participants are informed of the choices made and are paid accordingly in private and in cash.

The four situations you are asked to evaluate deal with effort decisions that **Employee 2** has to make after different combinations of wage and effort choices made by the **Employer** and **Employee 1**.

On each of the four attached sheets you will find a description of each situation as well as a table where you will indicate your responses.

Please raise your hand if you have any questions.

## 3) Decision Sheets (BASELINE)

**Participant ID Number** _______________

**Situation 1**

*Please write your Participant ID Number in the space provided above.*

The Employer chooses a wage of **32** for Employee 1 and **16** for Employee 2.

Employee 1 learns the wages chosen by the Employer, and then chooses **1 unit of effort**.

Employee 2 learns the wages chosen by the Employer and the effort chosen by Employee 1 and has to decide whether to expend 1, 2, 3 or 4 units of effort.

The table below summarizes the payoffs of Employer, Employee 1 and Employee 2 when Employee 2 chooses 1, 2, 3 or 4 units of effort.

**SITUATION 1: Employee 1 wage = 32; Employee 2 wage = 16; Employee 1 effort = 1**

| *Employee 2 chooses:* | *1 unit of effort* | *2 units of effort* | *3 units of effort* | *4 units of effort* |
|---|---|---|---|---|
| Employer earnings | -28 | -18 | -8 | 2 |
| Employee 1 earnings | 32 | 32 | 32 | 32 |
| Employee 2 earnings | 16 | 11 | 6 | 1 |

*The table below presents a list of the possible choices available to Employee 2. For each of the choices, please indicate whether you believe choosing that option is very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate, or very socially appropriate. To indicate your response, please place an "x" inside one box for each row.*

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| 1 unit of effort | | | | |
| 2 units of effort | | | | |
| 3 units of effort | | | | |
| 4 units of effort | | | | |

**Please make sure that you have placed one "x" in each row.**

**Participant ID Number _______________**

**Situation 2**

*Please write your Participant ID Number in the space provided above.*

The Employer chooses a wage of **32** for Employee 1 and **16** for Employee 2.

Employee 1 learns the wages chosen by the Employer, and then chooses **4 units of effort**.

Employee 2 learns the wages chosen by the Employer and the effort chosen by Employee 1 and has to decide whether to expend 1, 2, 3 or 4 units of effort.

The table below summarizes the payoffs of Employer, Employee 1 and Employee 2 when Employee 2 chooses 1, 2, 3 or 4 units of effort.

**SITUATION 2: Employee 1 wage = 32; Employee 2 wage = 16; Employee 1 effort = 4**

| *Employee 2 chooses:* | *1 unit of effort* | *2 units of effort* | *3 units of effort* | *4 units of effort* |
|---|---|---|---|---|
| Employer earnings | 2 | 12 | 22 | 32 |
| Employee 1 earnings | 17 | 17 | 17 | 17 |
| Employee 2 earnings | 16 | 11 | 6 | 1 |

*The table below presents a list of the possible choices available to Employee 2. For each of the choices, please indicate whether you believe choosing that option is very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate, or very socially appropriate. To indicate your response, please place an "x" inside one box for each row.*

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| 1 unit of effort | | | | |
| 2 units of effort | | | | |
| 3 units of effort | | | | |
| 4 units of effort | | | | |

**Please make sure that you have placed one "x" in each row.**

**Participant ID Number** ______________

### Situation 3

*Please write your Participant ID Number in the space provided above.*

The Employer chooses a wage of **32** for Employee 1 and **32** for Employee 2.

Employee 1 learns the wages chosen by the Employer, and then chooses **1 unit of effort**.

Employee 2 learns the wages chosen by the Employer and the effort chosen by Employee 1 and has to decide whether to expend 1, 2, 3 or 4 units of effort.

The table below summarizes the payoffs of Employer, Employee 1 and Employee 2 when Employee 2 chooses 1, 2, 3 or 4 units of effort.

**SITUATION 3: Employee 1 wage = 32; Employee 2 wage = 32; Employee 1 effort = 1**

| *Employee 2 chooses:* | *1 unit of effort* | *2 units of effort* | *3 units of effort* | *4 units of effort* |
|---|---|---|---|---|
| Employer earnings | -44 | -34 | -24 | -14 |
| Employee 1 earnings | 32 | 32 | 32 | 32 |
| Employee 2 earnings | 32 | 27 | 22 | 17 |

*The table below presents a list of the possible choices available to Employee 2. For each of the choices, please indicate whether you believe choosing that option is very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate, or very socially appropriate. To indicate your response, please place an "x" inside one box for each row.*

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| 1 unit of effort | | | | |
| 2 units of effort | | | | |
| 3 units of effort | | | | |
| 4 units of effort | | | | |

**Please make sure that you have placed one "x" in each row.**

**Participant ID Number** ______________

**Situation 4**

*Please write your Participant ID Number in the space provided above.*

The Employer chooses a wage of **32** for Employee 1 and **32** for Employee 2.

Employee 1 learns the wages chosen by the Employer, and then chooses **4 units of effort**.

Employee 2 learns the wages chosen by the Employer and the effort chosen by Employee 1 and has to decide whether to expend 1, 2, 3 or 4 units of effort.

The table below summarizes the payoffs of Employer, Employee 1 and Employee 2 when Employee 2 chooses 1, 2, 3 or 4 units of effort.

**SITUATION 4: Employee 1 wage = 32; Employee 2 wage = 32; Employee 1 effort = 4**

| *Employee 2 chooses:* | *1 unit of effort* | *2 units of effort* | *3 units of effort* | *4 units of effort* |
|---|---|---|---|---|
| Employer earnings | -14 | -4 | 6 | 16 |
| Employee 1 earnings | 17 | 17 | 17 | 17 |
| Employee 2 earnings | 32 | 27 | 22 | 17 |

*The table below presents a list of the possible choices available to Employee 2. For each of the choices, please indicate whether you believe choosing that option is very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate, or very socially appropriate. To indicate your response, please place an "x" inside one box for each row.*

| **Employee 2's choice** | *Very Socially Inappropriate* | *Somewhat Socially Inappropriate* | *Somewhat Socially Appropriate* | *Very Socially Appropriate* |
|---|---|---|---|---|
| 1 unit of effort | | | | |
| 2 units of effort | | | | |
| 3 units of effort | | | | |
| 4 units of effort | | | | |

**Please make sure that you have placed one "x" in each row.**