DISCUSSION PAPER SERIES

IZA DP No. 7802

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December 2013

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IZA Discussion Paper No. 7802
December 2013

ABSTRACT

Social Comparisons in Wage Delegation: Experimental Evidence*

This article examines whether social comparisons have behavioral effects on workers' performance when a firm can choose workers' wages or let them choose their own. Firms can delegate the wage decision to neither, one or both workers in the firm. We vary the information workers receive, finding that social comparisons concerning both wages and decision rights affect workers' performance. Moreover, the relative effect of discrimination in relation to decision rights is larger than in relation to wage. We find these treatment effects with both stated effort and a real-effort task, suggesting that both approaches may yield similar results.

JEL Classification: C91

Keywords: delegation, gift-exchange, experiment

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* Financial support from the Spanish Ministry of Education and Science (SEJ2010-17049/ECON; SEJ2009-11117/ECON), the Division of Social Sciences and the Department of Economics at UCSB, and Junta de Andalucía (P07-SEJ-02547; P07-SEJ-3261) is gratefully acknowledged.

1. Introduction

Akerlof and Yellen (1990) highlighted the importance of fairness considerations for workers' effort choices. When workers perceive that they are being paid an unfair wage they may reduce their effort. In real workplaces, it is likely that people consider their co-workers, who are comparable to them, to be a reference group for social comparisons. That is, workers' perception of fairness may depend on the wages paid to their co-workers (Frank, 1984) and on other social considerations.

This notion of social comparison is pervasive in a number of areas in economics, such as with respect to consumer behavior or membership in clubs or organizations. It is certainly a central issue in any labor setting, as workers may readily make comparisons to other workers at their own firms, in the same industry, or even in a similar industry. Social comparisons may affect one's attitude towards an employer or an institution, and thus in turn affect one's motivation. If an individual or group of individuals feels that an entity has been discriminatory, this is likely to lead to negative consequences for productivity and cooperation; in more extreme cases, a disgruntled person may even entertain engaging in sabotage (see, for example, Charness and Levine, 2011).[1] Perceived mistreatment need not reflect only monetary rewards. A professor who feels that an authority has unfairly passed her over for promotion or for a chaired position may very well feel resentment, which can affect not only productivity, but also departmental citizenship and enthusiasm for teaching. Discrimination on the basis of race may tend to disrupt the social fabric and is at the heart of a great deal of social policy.

[1] One could also consider this to be a diminishment of (or alienation with respect to) group membership or identity (Akerlof and Kranton, 2000; Charness, Rigotti, and Rustichini, 2007; Chen and Li, 2008).

While the experimental literature (reviewed in Section 2) has to some extent addressed the issue of horizontal social comparisons in employment relationships, all previous papers analyze the effect of social comparison among workers focusing on wage levels. However, a different form of social comparison could come from the fact that workers may have different *rights* in their companies. An example of such a right is the ability to choose own wage, as is considered in Charness, Cobo-Reyes, Jimenez, Lacomba and Lagos (2012); they find that when an employer delegates the wage choice to his employee, both firms and workers earn more. Indeed, at Semco (a Brazilian manufacturer company), all workers are allowed to choose the job they prefer or to decide on a payment system. On the other hand, at Claravision (a Spanish optical company) only some workers have the right to fix their wages. This brings in the dimension of social comparison with respect to decision rights.

To the best of our knowledge, this is the first article to test whether social comparisons have behavioral effects when firms can decide either to choose workers' wages or to let them choose these. We extend the Charness *et alii* (2012) experiment by considering the case where there are two workers per firm. In a partners-matching benchmark, firms can delegate the wage decision to neither, one or both workers. In order to test whether social comparisons influence workers' performance, we conduct treatments in which we vary the information workers receive. In one treatment, workers have no information about their co-workers. In another treatment, workers receive information on their co-workers' wage. In a third treatment, workers know both their co-workers' wage and whether their co-workers could choose their own wage or not.

Our article differs in one important aspect from all previous studies. We provide firms with two distinct tools with which to discriminate between workers: i) paying different wages, and ii) delegating the wage choice to just one of the two workers. As a consequence, social

comparisons are two-dimensional. A worker may be concerned about both his co-worker's wage and whether his co-worker sets her own wage or not.[2]

The experimental results show that social comparison plays a significant role in the workers' effort choices in this context. We find that when firms know that workers will receive information about their delegation decisions, the frequency with which they delegate the wage choice to exactly one worker is significantly reduced. That is, firms show some tendency to avoid situations where workers know they are being treated unequally regarding delegation decisions, perhaps anticipating that this could adversely affect the performance of the "worst treated" worker.

On one hand, workers' performance is, at least to some extent, affected by relative wage; on the other hand, workers make lower effort choices when they cannot choose their own wage while their co-workers can. Perhaps more surprisingly, overall we find that discrimination in decision rights has an overall larger effect than does wage discriminating in delegating the wage decision on the effort provided by the worker. This is a critical point, in that it implies that people care at least as much, if not more, about their rights relative to those of others as about relative wages. Thus, it behooves organizations to ensure that employees or members feel that their rights are being respected relative to those of other employees or members.

Our data also support and extend the results found in Charness et al. (2012). Similar to what was found in a one-employer-one-worker relationship, in a setting with two workers per firm we find that when an employer delegates the wage choice to their employees, they significantly provide higher effort levels. These results hold in all three treatments. In the lab, the benefits of the *delegation* device appear to be robust to increases in the size of the workforce.

[2] For convenience, we will consider in the paper the firm as female and the workers as male and female.

A controversial issue in experimental labor economics is that of behavior with *stated effort* versus behavior with *real effort*. Since the gift-exchange experiment of Fehr, Kirchsteiger, and Riedl (1993), most studies in this area have modeled "effort" as a choice of a cost, rather than the physical and/or mental exertion that is required to complete a task. However, in the past decade many experimenters have instead made use of simple tasks such as stuffing envelopes or solving mazes, etc. An open question is whether these approaches lead to different behavior. One view is that real effort has greater external validity. On the other hand, it is much easier to control (and to avoid heteroegeneity in) the cost of effort with stated effort. Charness and Kuhn (2011) provide a discussion on this point, pointing out that real-effort experiments are not necessarily superior. Our experiment sheds light on this issue. We conduct our first set of sessions using stated effort by workers, and we then attempt to reproduce our results with real effort by workers (the specific task consisted of adding up sets of five two-digit numbers during two minutes, as in Niederle and Vesterlund, 2007, e.g.). We are pleased to report that the main results found with stated effort are qualitatively similar to those found with a real-effort task.

The remainder of the paper is organized as follows. Section 2 provides a brief literature discussion and Section 3 explains the experimental design. We describe and discuss the main results in Section 4 and conclude in Section 5.

2. Literature review

There is a rather limited literature on social comparison in experimental economics. Moreover, as was stated before, all previous papers analyze the effect of social comparison among workers focusing only on wage levels. Overall, the results do not seem conclusive.

On one hand, some studies do not find evidence that worker performance is affected by wage comparison. Güth, Königstein, Kovács and Zala-Mezõ (2001), in an experiment in which a

firm faces two workers with deterministic but unequal productivity, find that when wages are observable, the firm offers less asymmetric wages than when they are not, although it is not clear whether this behavior is justified by the workers' effort choices. Along this line, Charness and Kuhn (2007) test whether the amount of cooperation is influenced by pay comparisons made between two types of workers (high productivity and low productivity) employed by the same firm in a gift-exchange experiment; while workers' effort choices are highly sensitive to their own wages, effort is not affected by co-workers' wages. Bartling and von Siemens (2011) study the impact of wage inequality on participation and effort choices in team production. They consider two experimental treatments: in one, the team members always get the same wage; in the other, wages always differ. As with the other papers mentioned, they do not find evidence that wage inequality has a significant impact on effort choices.

However, other studies have found evidence that workers' effort choices are affected by wage comparison. Clark, Masclet and Villeval (2010) introduce income comparisons between employees from different firms in a standard gift-exchange game. The reference group for employees consists of employees in other firms participating in the same experimental session. Using a stranger matching protocol, they find that an employee's effort is negatively affected by other employees' income. Siang, Requate and Waichman (2011) extend the results of Clark *et al.* (2010) to a fixed matching protocol, finding that information on the average wage reduces (increases) both wage offers and effort levels in one-shot (repeated) relationships. Gätcher and Thöni (2010) also find social comparison effects. In a three-person-gift-exchange game, they observe that disadvantageous wage discrimination leads to lower effort while advantageous wage discrimination does not increase effort. In order to explore whether wage comparison effects are due to intentional wage discrimination or payoff differences, they also conduct an experiment

where a random device chooses the wages. They show that reactions to wage discrimination can be attributed to the underlying intentions of discrimination rather than to payoff consequences.

Abeler, Altmann, Kube, and Wibral (2010) examine whether horizontal fairness concerns affect performance and efficiency in a gift-exchange game where workers first choose their efforts and firm then decides wages. In one treatment firms can choose the level of the wage but they are obliged to pay the same wage to both workers. In a second treatment, firms can wage discriminate between the two workers. The use of equal wages elicits substantially lower efforts, and the authors argue that the treatment difference is driven by the fact that the norm of equity is violated far more frequently in the equal wage treatment.

Card, Mas, Moretti and Saez (2012) propose a field experiment in which some workers of the University of California were informed about a new website in which they could see the pay of the other employees of the University; the workers were then asked about their job satisfaction and job-search intentions. The analysis compares the answers of workers who were informed and workers who were not, finding that job satisfaction depends on the pay comparison (although this relationship is not linear). Workers with salaries below the median report lower job satisfaction and a larger probability of looking for a new job, while those workers with salaries above the median are unaffected.

Our paper also contributes to a nascent experimental literature on delegation. Gneezy and Fershtman (2001) analyze the effect of strategic delegation in an ultimatum game, showing that when the proposer uses an agent her share is increasing. Bartling and Fischbacher (2012) conducted an experiment where subjects could delegate the choice between a fair or unfair allocation in a Dictator game, using a punishing option to elicit responsibility attribution. They find that responsibility attribution is effectively shifted, which constitutes a motive for the

delegation of the decision right. Coffman (2011) finds evidence that people blame someone less when that person utilizes an intermediary, even when they believe that choosing an intermediary is a deliberate attempt to avoid punishment.

Hamman, Loewenstein and Weber (2009) provide the results from experiments in which principals either decide how much money to share with a recipient or hire other agents to make decisions on their behalf. They show that recipients receive significantly less when hired agents make allocation decisions. Fehr, Herz and Wilkening (2010) study the motivation and incentive effects of authority in an authority-delegation game, suggesting that authority has a value per se. Finally, Gneezy, Gneezy, Nelson and Brow (2010) allow people in a field experiment at a theme park and on a boat cruise to pay what they wished for the services received. In some cases, particularly when part of the money paid went to charity, this gave the firm higher profits.

This paper also connects to the large theoretical literature on delegation. Zábojník (2002) and Van den Steen (2006) state that delegation might lead workers to improve their performance if workers consider that their decisions may have a higher probability of succeeding than those of the firm. In the same vein, Bester and Krähmer (2008) point that this improvement could be due to the fact that workers receive a larger benefit from executing their own decisions. Holmström (1977, 1984), Jensen and Meckling (1992), and Dessein (2002) analyze the trade-off between the firms being able to take advantage from their workers' information by delegating, and the cost that might arise because the decision of workers are biased towards their own benefits instead of the profits of the firms. [3]

[3] For a survey on theoretical delgation see Gibbons, Matouschek, and Roberts (2013).

3. Experimental design

3.1. Stated effort

The experimental design consists of three treatments: the Baseline, the Wage information treatment, and the Delegation and Wage information treatment. Each is a modified version of the gift-exchange game introduced by Fehr *et al*. (1993).

Baseline: In the first stage of this treatment, the firm chooses for each worker whether to assign the wage, w, or to allow the worker to choose his own wage. In this stage, the employer also asks for a non-binding effort, $\hat{e}$. The second stage depends on the decision in the previous one. If the employer has decided the wage, then the worker must only choose his effort level, e. If the employer has chosen to delegate, the worker chooses both his own wage and effort level.

The combination of wage and effort determine outcomes and monetary payoffs for both employer and employee in each period. The monetary payoff functions are given by:

(1) $\Pi_F = [(240-w_1)*e_1 + (240-w_2)*e_2]/2$,

(2) $\Pi_W = w-c(e)-20$,

where F denotes the firm, W the worker, e_i represents worker i's effort level, w_i is the wage that worker i receives and $c(e)$ is the cost of effort, a function increasing in e. Wages are integers between 20 and 120. The feasible effort levels and the cost of effort are as described in Table 1.[4]

Table 1. Effort levels and costs of effort

Effort e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Cost $c(e)$	0	1	2	4	6	8	10	12	15	18

[4] This cost of effort function was introduced by Fehr et al. (1998) and has been widely used in this literature. See, among others, Charness (2004) or Maximiano *et alii* (2007).

A firm is anonymously paired with the same two workers for all periods, and this is common information. Additionally, we consider that wage delegation is bounded. In the field, all parties would realize that workers could not make a decision that eliminates the firm's profits. Thus, we assume a maximum wage (w = 120) that is lower than the firm's redemption value of 240. In this manner, it is not possible for the worker to seize the firm's entire endowment.

Workers only had information about their own situation with respect to the firm. That is, each worker knows only whether or not he chooses his own wage, knowing nothing about the co-worker's wage or decision rights.

Wage information treatment: The only difference from the Baseline is the information workers receive. In this treatment workers receive the same information as in the Baseline plus the information about his co-worker's wage. In this treatment worker does not know whether his co-worker has chosen his own wage or not. Workers receive the co-worker's wage information before they provide the effort level.

Delegation and Wage information treatment: In this treatment workers receive the same information as in the Wage information treatment plus the information about whether his co-worker has chosen her own wage or not. Workers receive the co-worker's information before they provide the effort level.

The experiment was conducted at the University of Granada in 2012 with 252 participants, who were recruited using the online recruitment system ORSEE (Greiner, 2004) in the Faculty of Economics. All sessions were conducted in the lab, using Z-Tree software (Fischbacher, 2007). Participants played for 15 periods in all treatments. Upon arrival at the lab, each participant was randomly assigned a role as either a firm or a worker; this role was fixed throughout the whole session. No one participated in more than one treatment or session. We

conducted four sessions of 21 subjects for each Treatment (28 subjects as firms and 56 subjects as workers per treatment). On average, each person received 13.72€ for a one-hour session.

3.2. Real effort

To test whether the main results hold when workers must provide real effort, we conducted additional treatments with a task consisting of adding up sets of five two-digit numbers during two minutes: the Baseline-Real Effort (Baseline-RE, hereafter) and Delegation Wage Information-Real Effort (DWT-RE, hereafter) treatments.[5]

Baseline-RE: In the first stage of this treatment, the firm chooses for each worker whether to assign the wage, w, or to allow the worker to choose his own wage. In this stage, the employer also requests a non-binding number of correct sums. The second stage depends on the decision in the previous one. If the employer has determined the wage, then the worker has two minutes to solve sums. If the employer has chosen to delegate the choice of the wage, the worker chooses his own wage, prior to performing the task.

The wage and number of correct sums determines outcomes and monetary payoffs for employer and employee in each period. The monetary payoff functions are given by:

$$(1)\ \Pi_F = [(240-w_1)*(1+s_1)/10 + (240-w_2)*(1+s_2)/10]/2,$$

$$(2)\ \Pi_W = w-20,$$

where F denotes the firm, W the worker, s_i represents worker i's effort level, w_i is the wage that worker i receives. Wages are integers between 20 and 120.[6]

[5] Given that the most important finding with stated effort involves the comparison of the Baseline treatment with the DWT, we did not conduct a WT-RE treatment.

[6] In treatments with stated effort, the minimum effort workers can provide is 0.1. In order to maintain a parallel for the real-effort task, we use the term $(1+s_1)/10$ to compute firms' profits.

In this treatment, workers only had information about their own situation with respect to the firm. That is, each worker knows only whether or not he chooses his own wage, knowing nothing about the co-worker's wage or decision rights.

DWT-RE: In this treatment workers receive the same information as in Baseline-RE plus information about his co-worker's wage and information about whether his co-worker has chosen her own wage or not. Workers receive the co-worker's information before they provide the effort level.

These additional treatments were also conducted at the University of Granada with 105 participants, following the same experimental procedure that the previous treatments. We conducted five sessions of 21 subjects: two sessions of the Baseline-RE and three sessions of the DWT-RE. On average, each person received 20.81€ for a two-hour session.

4. Experimental results and discussion

4.1. Stated effort

4.1.1. Delegation

Before analyzing the effect of social comparison on workers' effort (our primary research question), we verify that delegation has beneficial effects in our two-worker-per-firm experimental environment. Table 2 presents a summary of the average wage and effort levels in our treatments.

We distinguish between decisions made under delegation (workers choose both wage and effort) and under non-delegation (firms choose the wage and workers choose effort). In the Baseline, workers chose higher wages and supply higher effort levels when the firm delegated. When workers chose their own wage, the average wage and effort levels were 115.45 and 0.66,

respectively, while when firms did not delegate, the wage choice were 84.12 and 0.46; thus, both wages and effort levels provided were substantially higher with delegation than without it. Conservative session-level tests (where each session is only one observation) gives $p = 0.014$ and $p = 0.028$ (one-tailed tests with directional predictions) for wages and effort levels, respectively. Wilcoxon matched-pairs signed-rank tests confirm that the differences are statistically significant for wages and effort levels ($Z = -7.834$, $p = 0.000$ and $Z = -4.527$, $p = 0.000$, respectively).[7,8]

Table 2. Summary of behavior

	Baseline	WT	DWT
Decisions under no delegation			
Effort	0.46	0.49	0.44
Wage	84.12	83.47	82.84
Worker profits	58.08	56.89	56.98
Firm profits	63.09	70.95	62.92
Total profits	177.14	187.97	178.20
Decisions under delegation			
Effort	0.66	0.69	0.62
Wage	115.45	112.09	115.87
Worker profits	85.56	81.47	86.89
Firm profits	79.17	82.01	73.16
Total profits	231.87	229.95	230.48

As Table 2 shows, in the Wage information treatment (WT, hereafter), where worker receives information on his co-worker's wage, the positive effect of delegation remains. The average effort when firms delegate the wage choice is 0.69 and when these ones do not delegate is 0.49. Differences are statistically significant ($Z = -4.519$, $p = 0.000$, one-tailed test). As in the

[7] We round off all probabilities to three decimal places. All non-parametric tests reported reflect individual-level data, unless otherwise stated.

[8] In all of the treatments and sub-treatments, a positive correlation between wage and effort level is found, as in the previous literature. This is strongly supported by a Spearman rank test ($rho = 0.642$, $p = 0.000$).

Baseline, average wages are also significantly larger under wage delegation (112.09) than under no wage delegation (83.47).[9] A one-tailed session-level test gives $p = 0.014$.

In the Delegation and Wage information treatment (DWT, hereafter), when worker receives the same information as in WT plus the information about whether his co-worker has chosen his own wage or not, the effect on effort choices of wage delegation also remains positive. The effort levels supplied with and without wage delegation are statistically significant. Wages are also significantly higher for the wage-delegation case.[10]

The higher effort levels displayed under delegation could reflect both the higher wages obtained when workers choose them and a positive reaction to delegation. In order to disentangle the effects of these two forces, we provide an econometric analysis (in Table B1 of Appendix B) that controls for the wage effect across treatments. We consider an OLS model where the dependent variable is the effort level, and find that choosing one's wage has a significant positive effect on effort choices in the three treatments, even controlling for the wage effect.[11,12]

We next consider whether workers are affected by the fact that decisions will be made public. In Table B2 in Appendix B we present an OLS regression, similar to Table B1, with two additional explanatory variables: i) a WT dummy that takes the value 1 when data come from WT and ii) a DWT dummy that takes the value 1 when data come from DWT. Results show that public information about both wages and delegation decision reduces workers' effort level.

[9] $Z = -7.578$, $p = 0.000$, two-tailed Wilcoxon matched-pairs signed-rank test.

[10] A one-tailed Wilcoxon matched-pairs signed-rank test on effort levels gives $Z = -3.569$, $p = 0.000$. Regarding wages, we find $Z = -7.766$, $p = 0.000$, one-tailed Wilcoxon matched-pairs signed-rank test with individual-level data. One-tailed session-level tests give $p = 0.014$ for both wage and effort.

[11] In this paper, we have estimated all regressions by computing OLS with robust (Eicker-Huber-White-Newey West) standard errors. We use this estimation method because we seek asymptotically unbiased results, but we try to avoid assuming non-autocorrelation and homoskedasticity on the random error terms.

[12] We find a positive correlation between delegation and desired effort (Cramer's V= 0.2497, 0.1478, and 0.2275 for the Baseline, WT and DWT cases, respectively; a Cramer's V of .10 is considered to provide a good minimum threshold for suggesting there is a substantive relationship between two variables). That is, when firms delegate the wage decisions, they request more effort. However, this correlation does not affect the econometric analysis.

However, public information only about wages seems insufficient and has no significant effect on the effort provided by workers. It seems that while "pay secrecy" does not affect workers' performance, "task secrecy" really pays for firms.

Turning to earnings, the data show that delegating pays for both firms and workers in all three treatments. In the Baseline treatment, the firms' earnings under delegation are significantly larger than under no delegation ($Z = 4.156$, $p = 0.000$, one-tailed Wilcoxon matched-pairs signed-rank test). This is also true in the WT and the DWT treatments ($Z = 3.054$, $p = 0.002$ and $Z = 2.086$, $p = 0.037$, respectively). These results support the notion that delegation pays for firms. With regard to workers, their average earnings are also significantly larger when they choose their own wage in all three treatments. Finally, average total earnings are significantly higher when a worker is given the right to choose her own wage.[13]

These findings lead to our first result:

Result 1*: In a trilateral gift-exchange with two workers per firm and under all the different information settings, delegating the wage decision enhances worker's performance relative with the case where firms do not delegate, and also increases the earnings of both firms and workers relative with the case where firms do not delegate.*

4.1.2. Social comparisons

Social comparisons may affect workers' performance. In this setting, firms can discriminate between workers in two ways: i) by paying different wages, and ii) by delegating the wage choice to just one of the two workers. As a consequence, social comparisons may

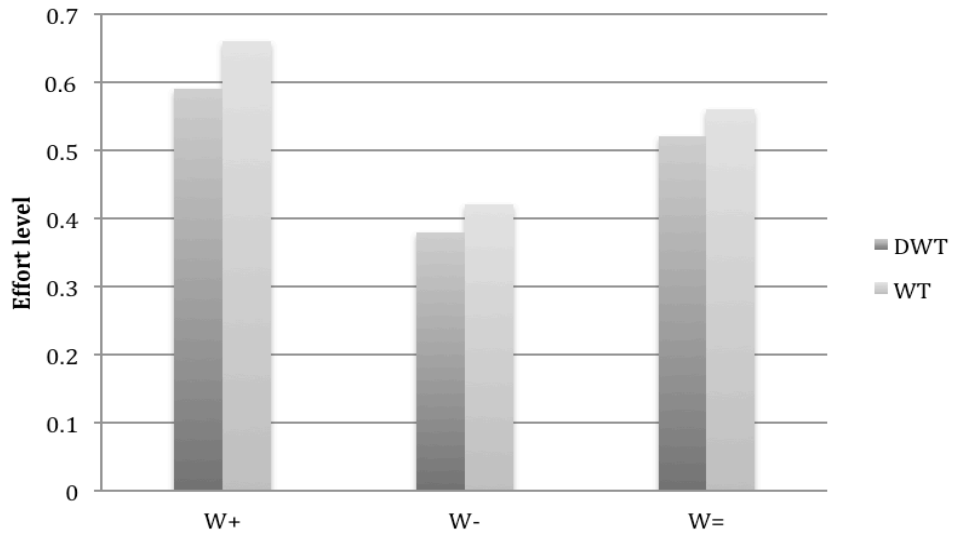
[13] The results for worker earnings are $Z = -8.042$, $Z = -7.543$, and $Z = -7.750$, for the Baseline, WT, and DWT treatments, respectively (two-tailed Wilcoxon matched-pairs signed-rank tests). The results for total earnings are $Z = 4.493$, $Z = 3.888$, and $Z = 3.686$, for the Baseline, WT, and DWT treatments, respectively, all significant at $p = 0.000$.

manifest from two different directions. We next analyze the extent to which a worker is concerned about both his co-worker's wage and whether or not she has chosen her own wage.

Wage discrimination

Figure 1 displays the average effort levels workers choose under the different wage conditions (for WT and DWT). W_+ (W_-) represents the situation in which the worker receives a larger (lower) wage than the co-worker and $W_=$ represents the situation in which both the worker and the co-worker receive the same wage.

Figure 1: Wage discrimination and effort



We see that discrimination in wages has an effect on the effort provided by workers. When workers receive a larger wage than the co-worker, the effort level displayed is significantly higher than when both of them receive the same wage. For DWT, effort levels are 0.59 and 0.52 for W_+ and $W_=$, respectively (Z = -3.876, p = 0.000, two-tailed Wilcoxon matched-pairs signed-rank test). In the same vein, effort in W_- is significantly lower than in $W_=$ (0.38 vs. 0.52, Z = -4.484, p = 0.000, two-tailed Wilcoxon matched-pairs signed-rank test); for WT, effort levels are 0.66 and 0.56 for W_+ and $W_=$, respectively (Z = -2.723, p = 0.006, two-

tailed Wilcoxon matched-pairs signed-rank test). Also, effort in W_- is significantly lower than in $W_=$ (0.42 vs. 0.56, Z = -3.801, p = 0.000, Wilcoxon matched-pairs signed-rank test).

In order to study whether wage comparison affects workers' performance, we conduct an econometric analysis for WT (model 1) and DWT (models 2 and 3). Table 3 presents OLS regressions in which the dependent variable is the effort provided by the worker. The explanatory variables are: i) the effort provided by the worker in the previous period, ii) the desired effort demanded by the firm, iii) the wage obtained by the worker, iv) the positive difference between the worker's wage and wage of the co-worker, and v) the negative difference between the worker's wage and wage of the co-worker. With the introduction of the last two variables we try to capture whether the effect of advantageous wage discrimination affects workers' performance in a different way than disadvantageous wage discrimination.

Table 3: GLS Regression on Effort

	(1) WT	(2) DWT_0	(3) DWT_1
Effort previous period	0.248*** (0.036)	0.315*** (0.045)	0.267*** (0.079)
Desired effort	0.075** (0.036)	0.103*** (0.038)	0.241*** (0.081)
Wage	0.004*** (0.0003)	0.002*** (0.0003)	0.002*** (0.0007)
Advantageous difference in wages	0.0006* (0.0003)	0.0012*** (0.0004)	0.0023*** (0.0004)
Disadvantageous difference in wages	-0.0011** (0.0003)	-0.0009*** (0.0003)	-0.0022*** (0.0006)
R-squared	0.889	0.865	0.915
N	784	462	140

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses. WT refers to the treatment where each worker knows the wage of the other worker. DWT_0 and DWT_1 refer to the treatment where each worker knows both the wage and decision right of the other worker, and the firm has delegated the choice of wage to zero or one worker, respectively.*

For this analysis, in model (2) we focus on the subsample in which firms do not delegate the wage decision to either worker. We consider this subsample for the following reason. As the aim is to isolate the effect of wage comparison on workers' performance, in order to avoid the possible distortion that may appear if firms delegate the wage decision, we consider only the situation in which the difference in wages comes directly from the firm's decision. Model (3) shows the same regression as model (2) but considers the subsample in which firms delegate the wage decision to exactly one worker. We see that the desired effort demanded by the firm, and the wages obtained by the worker exhibit a positive and statistically significant effect on workers' effort. In addition, the results also show that the effort provided by the worker in the previous period has a positive and significant effect on the effort provided in the current period.

Regarding the information workers receive about their co-workers, similarly to Gächter and Thöni (2010), we find that in WT disadvantageous wage discrimination leads to lower effort while advantageous wage discrimination weakly increases effort levels.[14] However, when workers receive explicit information about the fact that both wages have been chosen by the firm, the regression analysis shows both kinds of wage discrimination affects workers' performance (the positive difference in wages significantly increases the effort level and the negative difference in wages significantly reduces it). The positive effect of the favorable discrimination is larger than the negative effect of the unfavorable one.

Result 2*: Workers are concerned both about their own salaries and their relative wages with respect to their co-workers.*

Once we have shown that social comparison in wages affects workers' performance, the next step is to analyze whether the way in which wage discrimination is generated influences

[14] Note that this is not a trivial finding, as Charness and Kuhn (2007) do not find evidence of a concern for relative wages.

workers' decisions. In DWT workers have information about whether their co-workers have the chance of choosing their own wage. So, workers know if the wage discrimination comes directly from the firm's wage choices or it is a consequence of the fact that firms delegate the wage decision to just one worker. Results in model (3) of Table 3 are along the same line as results in model (2). Advantageous discrimination in wages significantly increases the effort level provided by the worker and the disadvantageous difference in wages significantly reduces it.

The size of the coefficients in models (2) and (3) seem to support the idea that the effect of the wage discrimination on workers' effort is stronger when the wage discrimination is due to the fact that the firm delegates the wage decision to just one worker. [15,16]

Delegation discrimination

In the previous section it has been shown that social comparisons regarding wages affects workers' decisions about the effort levels they will provide. A second source of social comparison occurs when the firm decides to delegate the wage decision to just one worker. This section analyzes the effect of discrimination in delegating the wage choice on workers' behavior.

Figure 2 shows the effort levels provided by workers under the different delegation conditions in DWT. D_{10} represents the situation in which the worker receives the right to choose own wage and the co-worker does not. D_{01} represents the reverse situation, and D_{11} (D_{00}) shows the case in which both (neither) workers receive this right.

[15] The coefficients in Table 3, model (3) show that, *ceteris paribus,* increasing by one unit the positive difference between the wage of the worker and the wage of the co-worker, leads to an increase of 0.0023 in the effort level provided by the worker. In the same way, *ceteris paribus*, increasing by one unit the negative difference between the wage of the worker and the wage of the co-worker decreases the effort level provided by the worker. When the wage discrimination comes directly from the firms' wage decision, model (2) shows that the effort level provided by the worker increases in 0.0012 and decreases in 0.0009 when, *ceteris paribus*, the wage of the worker increases by one unit compared to the wage of the co-worker, respectively.

[16] We do not use an interaction term, because we think it is better to use two different regressions for what we want to measure. We wish to see if the effect of wage discrimination exists when the wage discrimination comes directly from the wage decision by the firm. In column (3) we analyze whether the wage-discrimination effect holds when this discrimination comes from another previous discrimination, that is, discrimination in delegation. We then see that the wage-discrimination coefficients are larger in (3) than in (2).

When only the worker can choose own wage (D_{10}), the worker provides a larger effort level than when both the worker and the co-worker can do so (D_{11}).[17] When the discrimination in delegation goes in the other direction (D_{01}), effort levels are lower than when neither of the workers can choose own wage (D_{00}).[18]

Figure 2: Delegation discrimination and effort

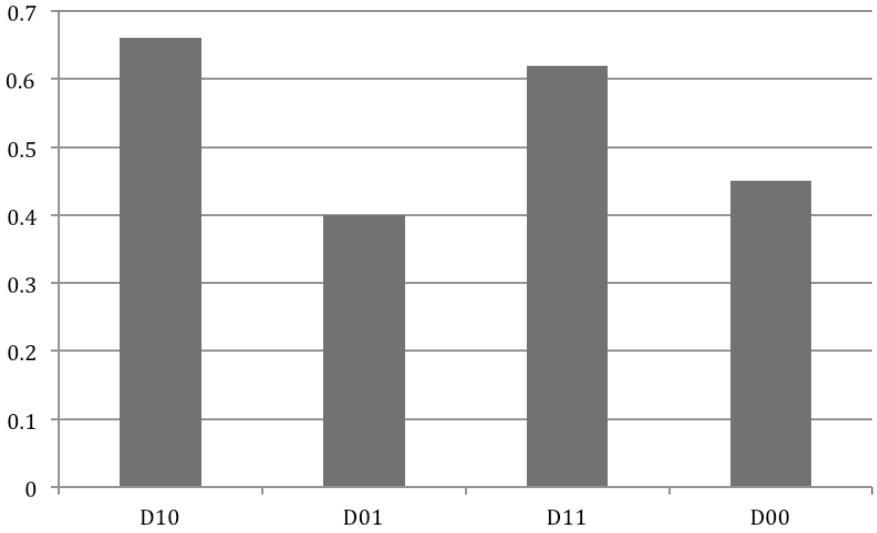


Table 4 presents the results of a regression in which the dependent variable is the effort level provided by the worker. As covariates we use the effort level provided in the previous period, the desired effort demanded by the firm, the wage received by the worker, a dummy variable that takes value 1 if the worker has been negatively discriminated against regarding delegation, that is, the worker has not chosen his own wage and the co-worker has, and 0 otherwise (*Delegation01*, hereafter), a dummy variable that takes value 1 if the worker has chosen his own wage and the co-worker has not, and 0 otherwise (*Delegation10*, hereafter), a

[17] The effort levels are 0.66 and 0.62 for D_{10} and D_{11}. The results with individual-level tests are not significant ($Z = 0.271$, $p = 0.786$, two-tailed Wilcoxon matched-pairs signed-rank test), perhaps in part because we must drop 27 observations out of 56 for these indidivual pairwise comparisons. However, the difference is highly significant for this test using all observations.

[18] The effort levels are 0.40 and 0.45 for D_{01} and D_{00}. The results with individual-level tests are not significant ($Z = -0.605$, $p = 0.542$, two-tailed Wilcoxon matched-pairs signed-rank test), perhaps in part because we must drop 24 observations out of 56 for these individual paiwise comparisons. However, the difference is highly significant for this test using all observations.

dummy variable that takes value 1 if the worker's wage is larger than the wage of the co-worker (*Positive wage discrimination*), and a dummy variable that takes value 1 if the worker's wage is lower than the wage of the co-worker (*Negative wage discrimination*).

This regression focuses on the effect of social comparison regarding the delegation decisions. Results show that, even controlling for discrimination in wages, both positive and negative discrimination in delegation have significant effects on workers' effort decisions. Workers significantly reduce their effort when they are not allowed to choose their own wage and know that their co-workers have chosen their wage. Similarly, workers significantly increase their effort levels when they are allowed to set their own wage while their co-workers are not.

Table 4: OLS Regression on Effort

	DWT
Effort previous period	0.338*** (0.035)
Desired effort	0.142*** (0.032)
Wage	0.002*** (0.0002)
Delegation01	-0.051** (0.024)
Delegation10	0.071** (0.028)
Positive wage discrimination	0.008 (0.019)
Negative wage discrimination	-0.082*** (0.016)
R-squared	0.88
N	784

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses*

Notice that the effect on effort levels of positive decision-right discrimination is stronger than the effect of positive wage discrimination. It seems that, in a sense, receiving rights provokes more of a reaction than receiving more money. Conversely, the effect on effort levels of negative wage discrimination is stronger than the effect of negative discrimination in delegation, so that getting paid less seems to be less of a trigger than not having the right to set one's own wage. Overall, it seems that there is more sensitivity to differential decision rights, as the difference in the coefficients for positive and negative discrimination in delegation is greater than the corresponding ones for positive and negative wage discrimination (0.122 versus 0.090).

Result 3*: Workers provide lower effort levels when they are not allowed to choose their own wage while their co-workers are. Similarly, workers provide larger effort levels when they are allowed to choose their own wage while their co-workers are not.*

4.1.3. Effect of information on firm's behavior

The feasibility of social comparison between workers may also affect the firm's behavior. If firms consider that asymmetric situations between workers may discourage the worse-treated worker's performance, firms may condition their decisions on the information available for workers. This fact could affect both their wage and delegation decisions.

Table 5. Percentage of times firms delegate to 0, 1, or 2 workers

	Baseline	WT	DWT
0	48%	55%	59%
1	28%	27%	18%
2	24%	18%	23%

DWT is the only treatment in which a worker receives information about whether the co-worker has been able to choose her own wage. Thus, if firms are concerned about avoiding this kind of asymmetric situations, in this treatment they should avoid delegating to exactly one of the two workers. Table 5 displays how often firms delegated the wage decision to zero, one, or

two workers.

When social comparison is feasible regarding delegation, we see that firms are substantially less likely to delegate to exactly one worker. While in the Baseline and WT the percentages are 28% and 27%, respectively, in DWT this percentage decreases to 18% (Z = 2.284, p = 0.011, Z = 1.921, p = 0.027, one-tailed Mann-Whitney tests on the *ex ante* hypothesis of this reduction, individual-level data). Thus, firms are less likely to engage in asymmetric delegation when there is this social comparison.

Table 6: Logit regression on likelihood of discrimination in delegation

$\lvert e_1\text{-}e_{2}\text{-}\rvert_{t-1}$	1.066*** (0.284)
WT	-0.045 (0.161)
DWT	-0.575*** (0.176)
Constant	-1.328*** (0.150)
LL	-635.778
N	1176

*Notes: ***, **,* denote two-tailed significance at p = 0.01, 0.05, and 0.10, respectively. Robust standard errors are in parentheses.*

The logit regression shown in Table 6, in which the dependent variable is a dummy that takes value 1 if the firm delegated the wage choice to exactly one worker and is 0 otherwise, confirms this result and reveals two others. We provide the results of a logit regression in which. As covariates we introduce the absolute value of the difference in effort choices between both workers in the previous period and two dummy variables regarding the information workers receive about their co-workers. The first dummy, WT, takes value 1 if workers receive

information about their co-workers' wages; the second dummy, DWT, takes value 1 when workers receive also information about whether their co-workers has chosen their own wage or not. The baseline treatment is the omitted category.[19]

We see that the larger the difference in effort choices between both workers, the larger the probability of firms treating workers unequally. This indicates that, as expected, workers' performance plays a significant role on the discriminatory policy of the firm. As mentioned above, in DWT when the social comparison regarding the delegation decisions of the firm is feasible, results confirm that the probability of firms discriminating between workers decreases significantly. However, the rate of discrimination in delegation is not significantly different from the Baseline in the WT treatment, where firms know that workers will only receive information about the wage of their co-workers. This evidence leads to our fourth result.

Result 4*: When the workers know whether the co-worker has or has not chosen her wage, firms are more likely to avoid delegating the wage choice to exactly one worker.*

Finally, avoiding discrimination between workers would be a profitable strategy only in the case that firms shifted to delegate the wage choice to both workers instead of shifting to not delegating it to any of them (the average firm's profits when she delegates to neither, one, or both workers are 62.92, 72.23 and 76.49, respectively).

[19] We also explore the reasons why firms delegate the wage decision to their workers. We perform logit regressions in Table B3 in Appendix B. The dependent variable is a binary variable that takes the value 1 if the employer delegates the wage decision to a particular worker and 0 otherwise. As explanatory variables, we use: i) the profits obtained by the firm in the previous period due to a particular worker (π_{t-1}); ii) a dummy, ($Delegation_{t-1}$), which is 1 when the firm delegated in the previous period and 0 otherwise; iii) the difference between the desired and the actual effort in the previous period, $\hat{e}_{t-1} - e_{t-1}$ and iv) the interaction between π_{t-1} and $Delegation_{t-1}$. The two main findings are: i) the closer the actual effort level to the desired effort, the more likely it is that the firm allows the worker to choose his wage in the next period; and ii) the firms' profits conditional on having delegated the wage decision in the previous period have a positive effect on the probability of delegating. These results suggest that in a multi-worker setting firms also use wage delegation as a tool to reward good employees.

4.2 Real effort

We have seen that the costly effort that people state in the laboratory is affected by social comparisons and that delegation of the right to choose a wage increases profits for both firms and workers. But this is a financial cost, whereas effort in the field typically involves an appreciable degree of physical or mental engagement. Will we see the same pattern when we introduce a task (adding columns of five 2-digit numbers) that can be done by (almost) all participants, is mildly mentally engaging, and is intrinsically interesting for only a few?

4.2.1. Delegation and social comparison with a real-effort task

Table 7 shows similar results to those in Table 2. That is, in both treatments, the average number of correct sums when firms delegate the wage choice is larger than when these ones do not delegate. Differences are statistically significant (Z =2.035, p = 0.041 for Baseline-RE and Z = 3.145, p = 0.001 for DWT-RE, two-tailed Wilcoxon matched-pairs signed-rank tests). Similarly, average wages are also significantly larger under wage delegation than under no wage delegation.[20]

The average profits are considerably higher for workers with delegation than without delegation, while the average profits for the firms are roughly the same in both cases (Z = 0.000, p = 1.000 for Baseline-RE and Z = 1.023, p = 0.306 for DWT-RE, two-tailed Wilcoxon matched-pairs signed-rank tests). The overall profits are also significantly higher with delegation (Z =2.667, p = 0.007 for Baseline-RE and Z = 2.722, p = 0.006 for DWT-RE). Finally, although this is most likely coincidental, note that the total profits with and without delegation are very similar to those with stated effort (Table 2).

[20] Z = 3.920, p = 0.000 for Baseline-RE and Z = 4.726, p = 0.000 for DWT-RE, two-tailed Wilcoxon matched pairs signed-rank tests on individual-level data.

Table 7. Summary of behavior with real task

	Baseline-RE	DWT-RE
Decisions under no delegation		
# correct sums	3.56	3.73
Wage	75.48	77.61
Worker profits	55.48	57.61
Firm profits	70.65	71.31
Total profits	181.82	190.84
Decisions under delegation		
# correct sums	4.61	5.24
Wage	112.86	110.91
Worker profits	92.86	90.91
Firm profits	73.34	77.13
Total profits	230.02	232.70

In order to test whether the positive effect of delegation with a real-effort task still holds when controlling for the wage, we provide an econometric analysis in Table B4 in Appendix B. We consider an OLS model in which the dependent variable is the number of correct sums. The explanatory variables are wage, the number of correct sums in the previous period and a Delegation dummy that takes the value 1 when in the current period the firm delegated and 0 when the firm did not. Results show that public information about both wages and delegation decision reduces workers' effort level. As with the results found with stated effort, we conclude that delegating the wage decision in a real-effort setting has a significant positive effect on workers' performance in both treatments, even controlling for the wage effect.

We next analyze whether social-comparison effects also remain when we move from stated effort to a real-effort task. Recall that with stated effort positive and negative wage discrimination both play a significant role in explaining workers' effort levels. In Table 8 we display the same econometric analysis as in Table 3, here using the number of correct sums as the measure of effort.

Results show that wage discrimination in our real-effort task only plays a significant role on the number of correct answers when this discrimination comes from the fact that the firm delegates the wage decision to just one of her workers. However, as shown in specification (1), when the firm assigns both wages, neither the advantageous difference in wages nor the disadvantageous difference in wages has a significant effect on workers' performance.

Table 8: OLS Regression on number of correct sums

	(1) DWT-RE_0	(2) DWT-RE_1
# Correct sums in previous period	0.387*** (0.057)	0.607*** (0.077)
Wage	0.028*** (0.003)	0.019*** (0.005)
Advantageous difference in wages	0.006 (0.006)	0.018** (0.007)
Disadvantageous difference in wages	0.0046 (0.004)	-0.010* (0.005)
R-squared	0.818	0.883
N	370	108

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively(two-tailed tests). Robust standard errors are in parentheses. DWT-RE_0 and DWT-RE_1 refer to treatments where each worker knows both the wage and decision right of the other worker, and the firm has delegated the choice of wage to zero or one worker, respectively.*

The second source of social comparison that was shown to have an effect on workers' behavior was the fact that the firm decides to delegate the wage decision to just one worker. In order to analyze whether the effect of discriminating in delegation still remains when workers face a real-effort task, we present in Table 9 the results of a regression similar to the one presented in Table 4 but instead using the number of correct sums as the measure of effort.

The results show that, controlling for discrimination in wages, only positive discrimination in delegation has a significant effect on workers' behavior. Workers significantly

improve their performance when they are allowed to set their own wage while their co-workers are not. Negative discrimination in delegation worsens performance, but not significantly. It seems that being the only worker given the right to choose her wage induces a reaction strong enough to affect workers' performance, while being the only worker not receiving this right has only a mild adverse effect.

Table 9: OLS Regression on number of correct sums

	DWT-RE
# Correct sums in previous period	0.467*** (0.045)
Wage	0.024*** (0.002)
Delegation01	-0.389 (0.310)
Delegation10	0.965*** (0.334)
Positive wage discrimination	0.230 (0.228)
Negative wage discrimination	0.278 (0.177)
R-squared	0.84
N	574

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses*

We summarize the main findings on worker behavior with a real-effort task in Result 5.

Result 5*: In a trilateral gift-exchange environment with a real-effort task, delegating the wage decision has a positive effect on workers' performance. In addition, discriminating by delegating the wage decision has a positive effect on the performance of the worker who received the right to choose her own wage.*

4.2.2. Effect of information on firm's behavior with a real-effort task

This subsection analyzes whether firms still condition their delegation decisions on the information available for workers in a real-effort task setting. If so, firms in DWT-RE should reduce the number of times that delegate to just one of the two workers compared to Baseline-RE. So, firms could try to avoid discrimination, as in the stated-effort setting. Table 10 displays how often firms delegated to neither, one or both workers. When social comparison is feasible regarding delegation with a real-effort task, we see that firms once again reduce the percentage of times that they delegated the wage choice to exactly one worker, although here this difference is not statistically significant ($Z = 0.667$, $p = 0.252$, one-tailed Mann-Whitney test).

Table 10. Percentage of times firms delegate to 0, 1, or 2 workers

	Baseline-RE	DWT-RE
0	66%	64%
1	24%	19%
2	10%	17%

Of course, the discriminatory policy of the firm is likely to be influenced by the performance of her workers. To delve more deeply into this issue, we provide the results of a logit regression in which the dependent variable is a dummy that takes value 1 if the firm delegated the wage choice to exactly one worker and is 0 otherwise. As covariates we introduce the absolute value of the difference in correct answers between both workers in the previous period and one dummy variable regarding the information workers receive about their co-workers. This dummy, DWT-RE, takes value 1 when workers receive information about their co-workers' wages and whether their co-workers has chosen their own wage or not. The baseline

treatment is the omitted category.

Table 11 shows that just as in the stated-effort treatment, workers' performance seems to play a significant role on the discriminatory policy of the firm in a real-effort setting. Likewise, in DWT-RE, where the social comparison regarding the delegation decisions of the firm is feasible, the probability of firms discriminating between workers decreases (marginally) significantly.

Table 11: Logit regression on likelihood of delegation discrimination

Difference in correct sums in previous period	0.156*** (0.044)
DWT-RE	-0.414* (0.227)
Constant	-1.541*** (0.204)
LL	-241.524
N	476

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses*

We summarize our findings in our final result.

***Result 6**: In a trilateral gift-exchange with a real-effort task, the likelihood that firms avoid delegating the wage choice to exactly one worker is lower when firms know that workers know whether one's co-worker has or has not chosen her wage.*

5. Conclusion

This article adds a new perspective to the analysis of social comparison. We propose a new multi-worker setting in which firms can delegate the wage decision to neither, one or both workers. We examine whether social comparisons have any behavioral effect on workers'

performance when firms can decide either to choose the worker's wage or to let him choose it himself. We find that there are strong and significant effects on workers' performance from social comparisons pertaining to both wages and decision rights. Further, we find behavior seems more sensitive to relative decision rights than to relative wages.

Those who are discriminated against tend to be less productive and those who receive favorable discrimination tend to respond with higher productivity. Moreover, we find that the positive effect of wage discrimination on the effort provided by the worker is weaker than when the firm discriminates in delegating the wage decision. Regarding the employers' behavior, we find that when workers receive information about the delegation decisions of the firms, firms significantly reduce the number of times in which they delegate the wage choice to just one of their two workers.

In addition, our data support and extend the results found in Charness et al. (2012). In a setting with two workers per firm, the benefits of the *delegation* device appear to be robust to increases in the size of the workforce. We find that delegating the wage decision enhances worker performance and leads to increases in the earnings for both firms and workers.

Interestingly, our results hold both with stated effort and a real-effort task. To the best of our knowledge this is the first research to confront this issue directly. While there are some slight differences in the results across these effort measures, the results are both qualitatively similar and, with respect to total earnings, quantitatively similar as well. Our study offers hope that these two approaches may be somewhat interchangeable, at least with respect to treatment effects.

Our findings have implications for the labor market. They suggest that in environments with more than one worker, delegating the wage decision could be a useful tool in order to

increase workers' productivity. Not only are social comparisons important for people, our data indicate that comparisons regarding rights may even play a larger role than comparisons over wages. The results suggest that peer concerns are strong, so that firms should be cautious about asymmetric treatment of their workers in many dimensions, as this may well lead to negative perceptions and inferior productivity. We suspect that this applies more generally to environments beyond the employment relationship, and one interesting extension could involve exploring the extent to which people care about decision rights in other contexts. Future research is needed in this important area of discretionary incentives and rights.

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Appendix A

Instructions for the Delegation and Wage information Treatment

1. In order to assure anonymity you have been randomly assigned a code (yellow card).
2. There are three different kind of participants in the experiment: firm, worker A, and worker B. Each firm will be randomly matched with one worker A and one worker B. Every firm will be matched with the same worker A and worker B for the whole experiment.
3. At the beginning of the experiment you will be randomly assigned to a role (firm, worker A or worker B). The role will be fixed during the experiment. You will not know the identity of the participants in your group.
4. There will be a total of 15 periods in the experiment. Each period is composed of four stages:
5. Stage 1:
    a. The firm has to choose among four ways of establishing worker's wage:
        i. The firm chooses the wage for both worker A and worker B.
        ii. The firm chooses the wage for worker A and allows worker B to choose his own wage.
        iii. The firm chooses the wage for worker B and allows worker A to choose his own wage.
        iv. The firm allows worker A and worker B to choose their own wage.
    b. The firm announces a non-binding desired effort to worker A and worker B. The firm may ask for a different effort level to each worker.
6. Stage 2:
    a. If the firm decides to establish the wage for the worker, then the firm has to choose a wage between 20 and 120. The firm can choose a different wage for each worker.
    b. If the firm allows the worker to choose his own wage, then the worker has to choose a salary between 20 and 120.
7. Stage 3:
    a. The worker will know co-worker's wage and he will also know if the firm allowed the co-worker to choose his own wage.
8. Stage 4:
    a. Workers have to decide the effort level they will provide. The effort level chosen by the worker may be larger, equal or smaller than the desired effort level demanded by the firm. The effort level must be a number between 0.1 and 1.
    b. The larger the effort level provided by the worker, the larger the cost the worker has to pay. The associated costs for each effort level are shown in the following table.

Effort level	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1**
Cost	0	1	2	4	6	8	10	12	15	18

9. The profits for the firm in each round are given by:

Firm's profits = [(240 - wage A) ∗ effort A + (240 - wage B) ∗ effort B]/2

Then, firm's profits are larger the larger the effort level provided by workers and the lower the wage received by the workers.

10. Profits for workers A and B are computed as follows:

Worker's profits= wage – cost – 20

11. For example, imagine that the wage for worker A is 60 and his effort level is 0.5, the wage for worker B is 70 and his effort level is 0.4, then the profits in this round would be:

Firm's profits = [(240 – 60) ∗ 0.5 + (240 – 70) ∗ 0.4]/2 = [90 + 68]/2 = 74 tokens

Worker A's profits = 60 – 6 – 20 = 34 tokens

Worker B's profits B = 70 – 4 – 20 = 46 tokens

12. At the end of each round workers will receive information about their salary, their effort and their profits.
13. At the end of each round firms will receive information about the effort level provided by each worker and firms' profits.
14. At the end of the experiment we will pay you privately. Your final profits will be the sum of the tokens you have obtained along all the 15 periods. The tokens obtained will be converted into Euros at the rate: 5 tokens=0.1 Euro.
15. You will participate in two practice periods before starting the experiment.

SUMMARY

- If you are a firm:
  - You have to choose who is going to fix the wage (the worker or yourself) and you have to announce the effort you want the worker to provide (a number between 0.1 and 1).
  - If you decided to fix the wage for the worker, you have to pick a salary between 20 and 120.
- If you are a worker:
  - If the firm allowed you to choose your own wage, then you have to pick a salary between 20 and 120.
  - You have to choose an effort level between 0.1 and 1, knowing the cost associated to each effort level.

QUESTIONAIRE

Just to be sure that you understand the instructions you have to solve a very simple questionnaire. When everyone in the room has answered the questionnaire correctly we will start the experiment.

1. The wage for worker A is 110 and his effort level is 0.8, the wage for worker B is 80 and his effort level is 0.7, then the profits in this round would be

Firm's profits = [(240 – __) ∗ __ + (240 – __) ∗__]/2 = [__+__]/2 = __ tokens

Worker A's profits = __ – __ – 20 = __ tokens

Worker B's profits B = __ –__– 20 = __ tokens

Appendix B

Table B1: OLS Regression on Effort

	(1) Baseline	(2) WT	(3) DWT
Wage	0.004*** (0.0003)	0.005*** (0.0002)	0.004*** (0.0002)
Desired Effort	0.114*** (0.033)	0.073*** (0.028)	0.168*** (0.032)
Delegation	0.046** (0.020)	0.042** (0.019)	0.043** (0.020)
R-squared	0.871	0.878	0.851
N	840	840	840

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses. Baseline, WT, and DWT refer to conditions in which the worker has no information about the other worker's wage or decision rights, only information about the other worker's wage, and information about the other worker's wage and decision rights, respectively.*

Table B2: OLS Regression on Effort

	Baseline vs. WT	Baseline vs. DWT	WT vs. DWT
Wage	0.005*** (0.0001)	0.005*** (0.0002)	0.005*** (0.0002)
Desired Effort	0.092*** (0.022)	0.164*** (0.023)	0.151*** (0.022)
Delegation	0.042*** (0.014)	0.040*** (0.014)	0.039*** (0.014)
WT	0.002 (0.011)		
DWT	-	-0.051*** (0.010)	-0.075*** (0.010)
R-squared	0.874	0.864	0.868
N	1680	1680	1680

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses. Baseline, WT, and DWT refer to conditions in which the worker has no information about the other worker's wage or decision rights,*

Table B3: Logit regression on the probability of delegation

	Baseline	WT	DWT
π_{t-1}	-0.006** (0.003)	-0.002 (0.003)	-0.002 (0.002)
$\hat{e}_{t-1} - e_{t-1}$	0.505 (0.437)	1.052** (0.484)	0.815** (0.391)
Delegation_{t-1}	-1.698*** (0.531)	-0.163 (0.532)	-1.548*** (0.519)
π_{t-1}x Delegation_{t-1}	0.025*** (0.005)	0.012** (0.005)	0.023*** (0.005)
LL	-499.581	-457.824	-472.215
N	784	784	784

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses. Baseline, WT, and DWT refer to conditions in which the worker has no information about the other worker's wage or decision rights, only information about the other worker's wage, and information about the other worker's wage and decision rights, respectively.*

Table B4: OLS Regression on the number of correct sums

	(1) Baseline-RE	(3) DWT-RE
Wage	0.021*** (0.003)	0.243*** (0.002)
# Correct sums in previous period	0.535*** (0.051)	0.485*** (0.044)
Delegation	0.758*** (0.020)	0.401* (0.225)
R-squared	0.860	0.840
N	392	574

*Notes: ***, **,* denote significance at p = 0.01, 0.05, and 0.10, respectively (two-tailed tests). Robust standard errors are in parentheses. Baseline-RE refers to the real-effort condition where the worker has no information about the co-worker's wages or decision right, while DWT-RE refers to the condition where the worker knows both the co-worker's wage and decision rights.*

Appendix C

Figure C1: Effort over time (stated effort)

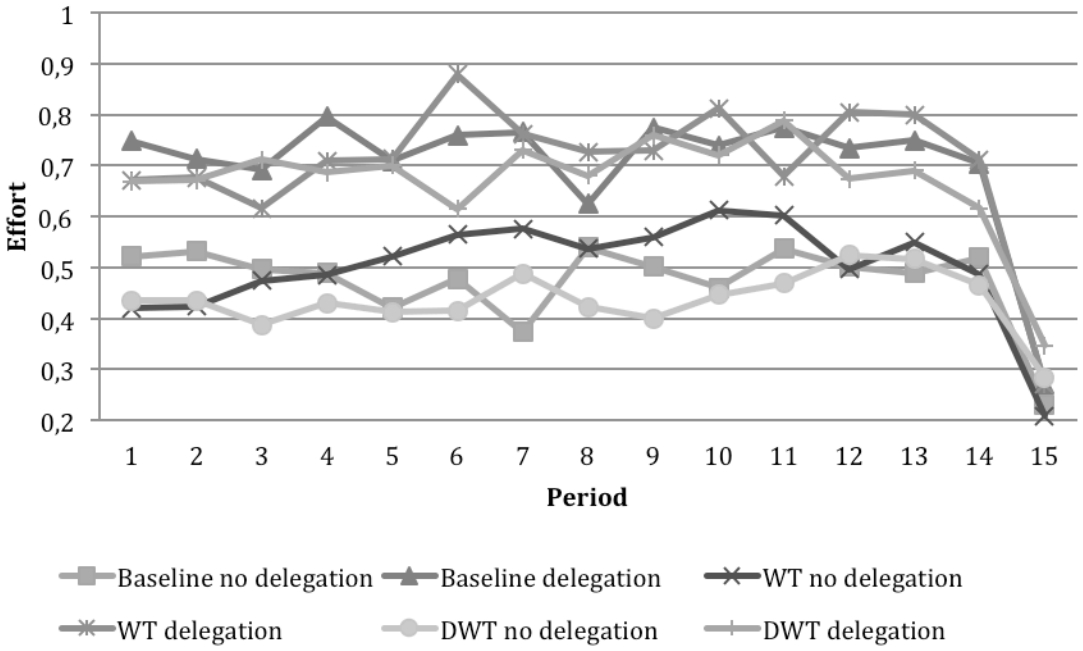

Figure C2: Effort over time (real effort)

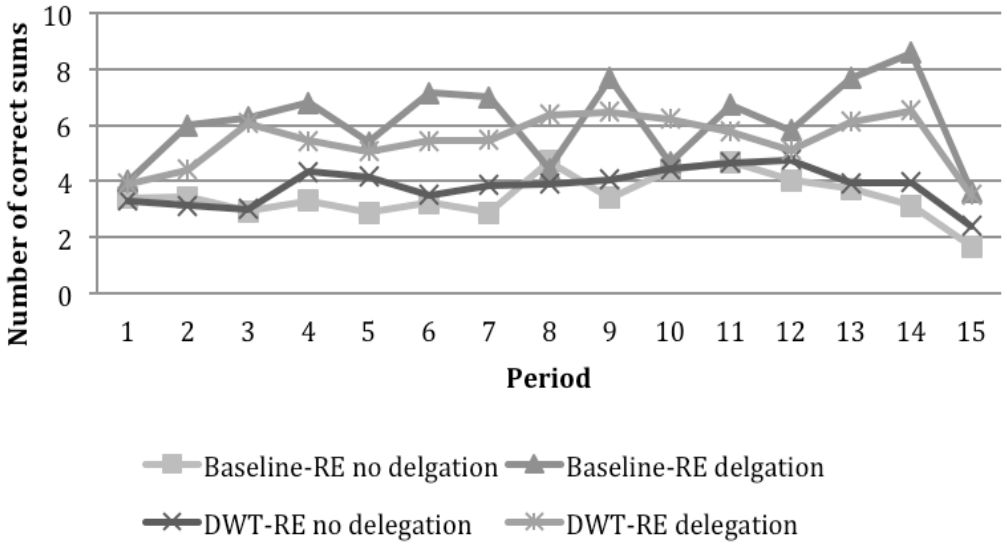

Figure C3: Wage over time (stated effort)

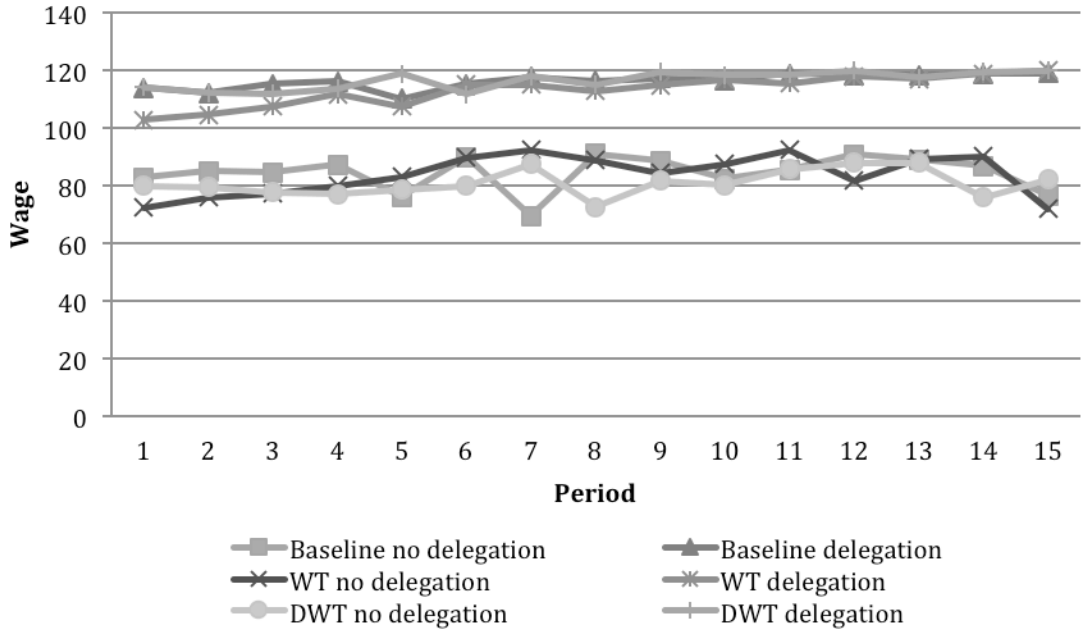

Figure C4: Wage over time (real effort)

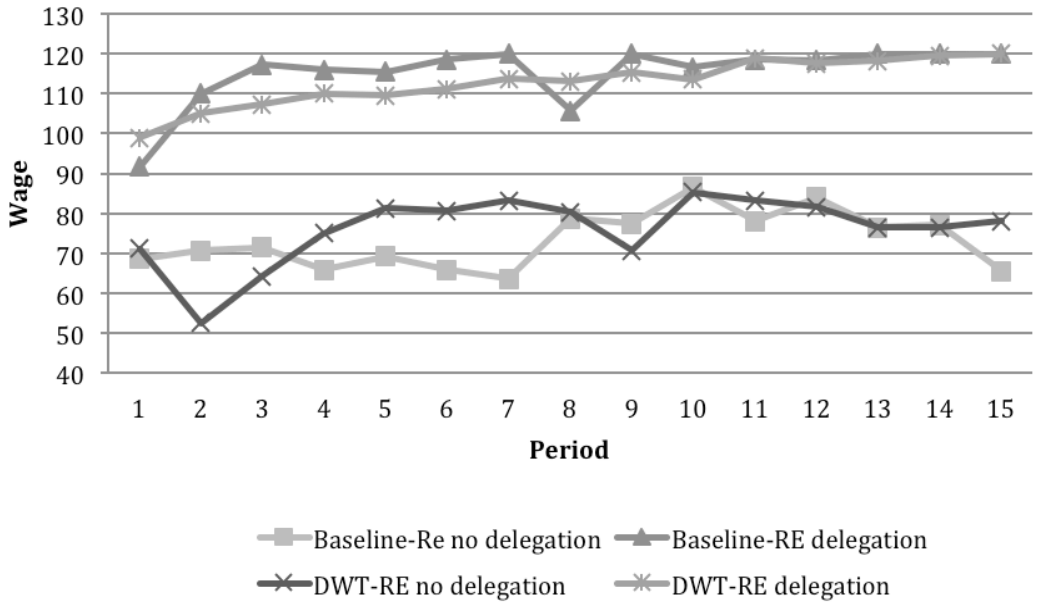

Figure C5: #delegations over time (stated effort)

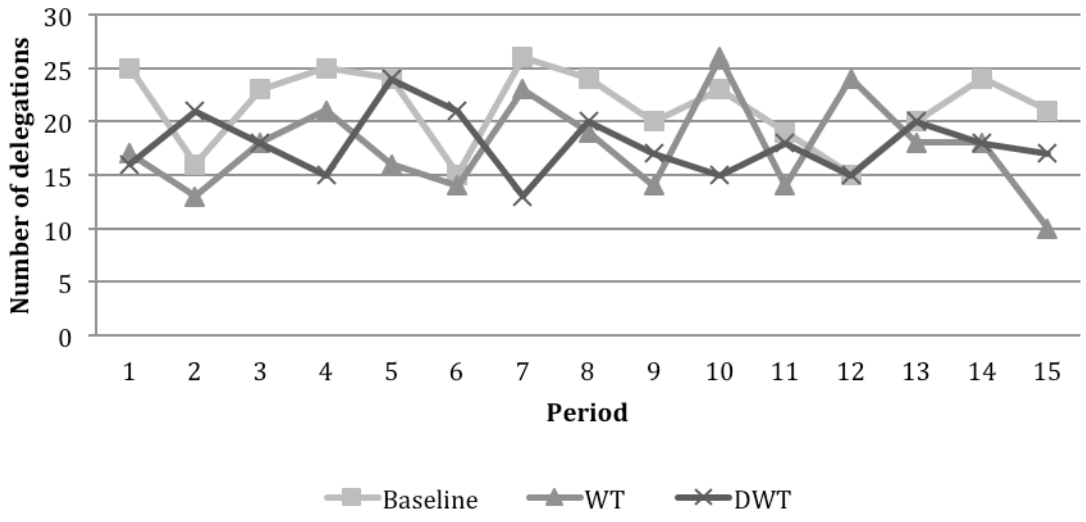

Figure C6: #delegations over time (real effort)