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It's not you, it's me: an experimental study of employers' wage setting behavior

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Abstract

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1 Introduction

Since the seminal work by Fehr et al. (1993), a large body of experimental literature based on gift-exchange models has been developed to investigate effort choices in labor relationships. Following the gift-exchange idea, employees would reciprocate to higher than market-clearing wages by increasing their effort levels, and withhold effort if they consider they have not been remunerated by a fair wage (Akerlof, 1984; Akerlof and Yellen, 1990). Further literature extended the models to the case where two workers are matched to one principal, and found that worker's peer wage comparisons would also influence effort choices (Charness et al., 2004; Gächter et al., 2013; Gächter and Thöni, 2010), implying that employees would not only consider market-clearing wages as a benchmark for fair wages, but would also react to employers' wage discriminative postures over employees. Summing up, wages are deliberately chosen by employers to influence the effort exerted by their employees.

Indeed, research in experimental economics suggests that wage setting is determined by the beliefs employers form about the way employees' performance will react to given wages. However, little has been said about the employers' perception of their own performance, and how this may be influencing their wage setting behavior as employers may, e.g., anchor their beliefs about their employees' performance capabilities on their own performance (similar to imputing someone's knowledge, see, e.g. Nickerson, 1999; Nickerson et al., 1987). Thus, are wages offered influenced by the employers' own (past) performance in the contracted task?

Moreover, there are rather stereotypical beliefs about age being directly linked to productivity (Cain, 1987), and about performance declining with age (Kovalchik et al., 2005). Many employers still consider older workers to be relatively less productive than younger workers (see Wasmer, 2011, for a discussion). Given that, a natural further question is whether perception about own performance influence younger and older employers wage setting behavior to the same extent.

Our article contributes to the understanding of the interdependence between wages and productivity in the labor market by investigating the impact of the employers' own performance and age on their wage setting behavior.

2 Experimental Design and Hypothesis

2.1 Design

Our experimental design is based on an intergenerational, mixed-age three-person gift-exchange experiment as conducted by Gächter and Thöni (2010).

At the beginning of the experiment one third of the participants is randomly assigned to the role of "employers" and the remaining two-thirds to the role of "employees" such that an equal number of younger and older participants is assigned within each role. *Younger* participants are between 18 and 26 years old, *Older* participants are at least 55 years old.

The experiment consists of a training phase and two periods of trilateral gift-exchange, each corresponding to one treatment and all involving the realization of the same real effort task.

During the experiment, for each of the two treatments anew, each employer is randomly matched to two employees, which we label here employee 1 and employee 2[1], who then constitute either age-homogeneous or age-heterogeneous work teams. Participants assuming the role of employee 1 in one treatment assume the role of employee 2 in the other treatment. Thus, for each treatment half of the work teams are age-homogeneous, i.e. one quarter of all work teams consists only of younger and one quarter only of older participants, and half of the work teams are age-heterogeneous, where again one half of the employees 1 is a younger participant and the other half an older participant. In each treatment each employer faces a different age composition. This balances the different age compositions of firms with regard to the employers' age and the age-homogeneous and heterogeneous teams of employees.

At the beginning of each treatment the employer receives an endowment of 10 euros from which she pays a wage to her employees. Wages can take only the values of 3, 5, or 7 euros. The participant assigned to the role of employee 1 receives an exogenously determined wage of 3 euros (w_1).

For the remaining employee 2, the employer decides on whether paying a wage of 5 euros (w_2^L) or a wage of 7 euros (w_2^H). At the moment of choosing the wage, the employer only counts on information about the age group of her employees that is provided to her for both employee 1 and employee 2.

Once the employers choose the wages, the employees receive the information on their own wage, as well as the wage and age group of their co-worker, the employees simultaneously exert effort, summing up two three-digit-numbers for a duration of 120 seconds, resulting in the performance levels e_1 and e_2.

The numbers are placed one next to the other – horizontally – on a computer screen, and every correct sum is compensated by a piece rate of 0.30 euros in the training phase and the *own effort* treatment, and 0.15 euros in the *joint effort* treatment where employees receive the piece rate also for their co-worker's performance.

The employer's payoff in the *own effort* treatment is determined by

$$\pi = 10 - w_1 - w_2^{L \text{ or } H} + (e_1 + e_2) \times 0.30 \tag{1}$$

and in the *joint effort* treatment by

$$\pi = 10 - w_1 - w_2^{L \text{ or } H} + (\frac{e_1 + e_2}{2}) \times 0.30. \tag{2}$$

The treatments differ in how employees' performance enter employers' payoff by means of distinct piece rates. However, according to the static sub-game perfect equilibrium under standard assumptions, employers would always offer employee 2 the lower wage w_2^L independently of their own age and the specification of the employees' payoff function. That said, rewarding performance in one of the treatments with a lower piece rate makes it even more salient to the employer that paying w_2^H is detrimental to her own earnings.

Independently of the role the participants later take, they all have a training phase of 160 seconds to perform the same real effort task the employees will later have to perform. This training phase should help the employers to assess the output generated by their own effort. Once the training phase is completed and before the treatments start, participants

1 These labels are not shown to the participants. We use the labels here only to distinguish between the two employees of a firm since their wage is determined differently.

are informed about their own performance, which is the number of good sums they compute. They do not receive any information about the other participants' performance nor any feedback between the two treatments.

The experiment took place at the Jacobs University Bremen Laboratory for Social Sciences. A total of 174 participants from the state of Bremen, Germany, took part in our computerized study. We conducted 16 sessions, each lasting less than 1 hour. At the beginning of each session, the instructions were read out loud to the participants. Finally, a set of control questions were asked to test for the participants' understanding of the experiment. The experiment was run utilizing zTree (Fischbacher, 2007) and concluded with a brief questionnaire that includes an incentivized elicitation of the participants' other-regarding preferences (Balafoutas et al., 2014; Kerschbamer, 2013).

The employers' average earnings was 8.45 Euro (SD 3.65), employees earned on average 11.80 Euro (SD 1.40). Additionally, both employers and employees earned an average of 2 Euros corresponding to the distributional preferences elicitation task.

2.2 Hypotheses

Based on the literature previously reviewed, we test the following hypotheses:

HYPOTHESIS 1. Employers always pay the lowest possible wage w_2^L.

HYPOTHESIS 2. Employers' wage setting behavior is independent of the different payoff specifications.

HYPOTHESIS 3. Employers' wage setting behavior is independent of employers' own age.

HYPOTHESIS 4. Employers' wage setting behavior is independent of employers' own performance.

3 Results and Discussion

Since participants are re-matched and no information is provided to either employers or employees between the two treatments the wage setting behavior is elicited in a way akin to the strategy method (Brandts and Charness, 2011) and is therefore not affected by any learning. Hence, for the purpose of this article we do not need to analyze the performance of the employees under the various conditions and can solely focus on the employers' wage setting behavior.

3.1 Results

We reject Hypothesis 1. We do not reject Hypothesis 2. Despite the prediction of the sub-game perfect equilibrium to always pay w_2^L, some employers still choose to pay w_2^H. Yet, it seems that wages are not affected by the variation in the employer's payoff function what also contradicts the classical theory of efficiency wages (Campbell, 1993; Peach and Stanley, 2009; Solow, 1979) predicting that wages increase as the marginal benefit of the employee's performance for the employer increases.

As can be seen from Table I, we observe that 19 times a wage of w_2^H is offered in the *own effort* treatment and 18 times in the *joint effort* treatment, i.e. regardless of

the payoff specification, nearly one third of all wage choices deviate from the sub-game perfect equilibrium.

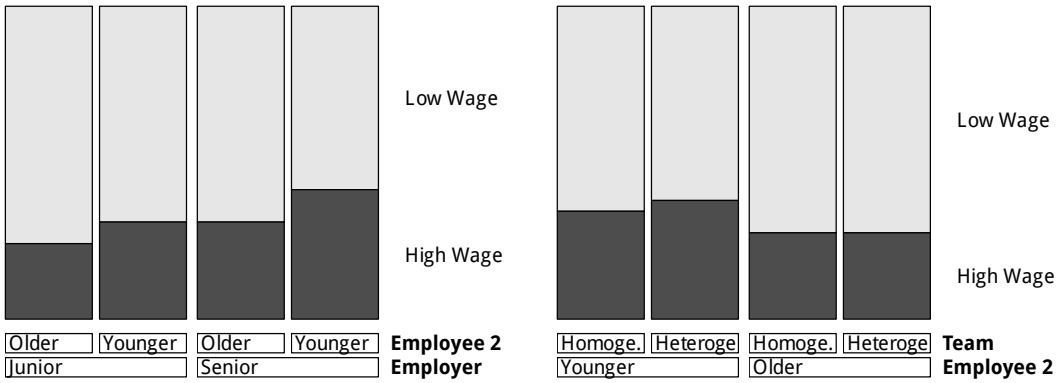
Additionally, while the majority of participants stick with their initial wage offer, 13 and 14 participants, respectively, switch from a wage offer of w_2^L to w_2^H and the other way around between treatments. Only five participants choose consistently a wage w_2^H of 7 euros in both treatments.

Table I: The number of Low and High Wage Choices does not depend on the treatment

		Joint Effort	
		w_2^L	w_2^H
Own Effort	w_2^L	26	13
	w_2^H	14	5

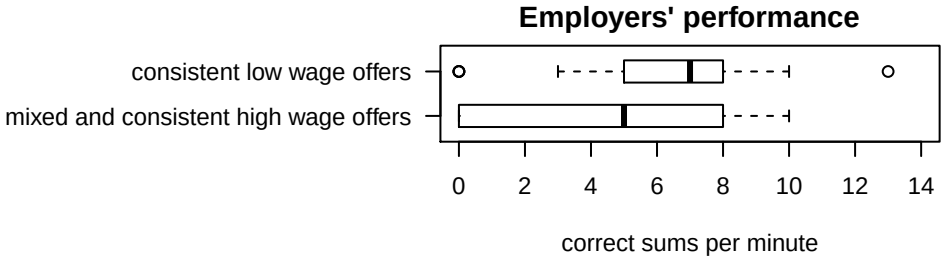
We do not reject Hypothesis 3. Consistent with the data analyzed in Büsch et al. (2009), we find no statistically significant dependence of the wages paid on the employers' age and the firm's age composition. Younger and older employers are as likely to offer a wage of w_2^L to their employee – as illustrated in the mosaic plots in Figure 1 showing the relative number of low and high wage choices under the various conditions –, independent of the employee's age (Woolf test on homogeneity of odds ratios: $p = 0.898$; Mantel-Haenszel-χ^2-test: $p = 0.927$) and whether the employees within the firm are age-homogeneous or age-heterogeneous (Woolf test: $p = 0.852$; Mantel-Haenszel-χ^2-test: $p = 0.985$).

Figure 1: The number of High Wage choices is independent of the employers' and employees' age and the age composition of the firm



We reject Hypothesis 4. Employers offering consistently the wage predicted by the sub-game perfect equilibrium w_2^L under both payoff specifications obtained on average 6.2 correct sums per minute during the training phase while employers offering at least once a wage of w_2^H performed worse with on average only 4.1 correct sums per minute (two-sided t-test, $p = 0.023$, see also the boxplot in Figure 2).

Figure 2: Employers offering consistently low wages performed better in the real effort task



Extended Results. To further analyze the data with respect to our hypotheses, we consider additional employers' personal indicators. Table II shows the results of five logistic regressions with consistent low wage offers as the dependent variable: It takes the value of 1 if the employer offers w_2^L in both treatments, and the value of 0 otherwise.

Table II: Weak Performing Employers Offer Higher Wages

	Model 1	Model 2	Model 3	Model 4	Model 5
Own Performance	0.169				0.167
	(0.075)**				(0.090)*
Helpful				-0.333	-0.398
				(0.164)**	(0.176)**
Trust				0.831	2.168
				(0.794)	(1.040)**
High Income		-0.944			-2.074
		(0.571)*			(1.172)*
Seniors			-0.561		-1.688
			(0.538)		(1.356)
High Income × Seniors					2.455
					(1.659)
Female					-0.002
					(0.654)
Constant	-1.083	0.405	0.069	1.151	0.814
	(0.466)**	(0.460)	(0.374)	(0.959)	(1.162)

Logistic Regressions on Consistent Low Wage Offers: * $p < 0.1$; ** $p < 0.05$

To investigate the effect of the employers' perception about own performance we include the employers own performance level during the training phase, which is, as expected, a strong and significant predictor: the predicted probability of consistently offering the lower wage w_2^L implied by following rationality assumptions, increases substantially with the employers' own performance during the training phase.

Additionally, we controlled for income level, gender, and social trust[2]. Income was elicited by a small number of ordered categories, we applied the median split procedure

2 For income six cases had to be imputed.

to generate a dummy for High Income. For investigating the effect of social trust, we included two questions suggested in the European Social Survey (ESS, 2012) in our ex-post questionnaire, which corresponds to the variables "Trust" and "Helpful" in Table 1[3]. Given that High Income and age group are related (Fisher exact test: $p = 0.012$), we added an interaction variable as an additional control in the last model.

When looking at social trust, we find both variables to be significant in the extended model. On the one hand, people exhibiting higher levels of trust are more likely to give consistently the lower wage w_2^L. On the other hand, the more people think that others try to be helpful as opposed to look out for themselves, the more likely they are to give the higher wage w_2^H at least once. High Income appears to be significant, though not the interaction term with age; the last evidencing the absence of a significant income-age effect. Employers with a High Income outside the laboratory are less likely to offer the low wage. Last, our results show no significant differences among different genders or age groups.

3.2 Discussion

According to the theories mentioned in the introduction, those employers offering at least once the higher wage w_2^H would be expecting the employees to reciprocate with an effort that would compensate for the 2 euros difference between offering w_2^L and offering w_2^H which equals to solve successfully at least 7 additional sums in the *own effort* treatment, and 14 additional sums in the *joint effort* treatment. However, employers consistently offering w_2^L do exhibit higher profits than those offering w_2^H at least once. The difference is of 30% on average indeed (10.1 vs. 7.04 euros, one-sided t-test, $p = 0.004$). Employers consistently offering the lower wage w_2^L also exhibit higher levels of trust. Relying on reciprocal behavior as a means to opportunistically increase own earnings seems therefore implausible as an explanation for observed wage choices.

Paying a higher wage could also be the result of other regarding preferences. It could be that employers offering w_2^H would directly benefit from a higher utility through, e.g., reducing inequity. However, our data rejects this explanation. Giving the higher wage is independent from the measure of other-regarding preferences (Kerschbamer, 2013) that we elicited (Fisher exact test, $p = 0.924$). This would still leave altruism and warm glow giving as a possible explanation. Employers offering w_2^H would then benefit from a higher utility purely through the act of giving (Andreoni, 1990). The last being supported by the always significant coefficient of 'Helpful.'

A possible explanation for the higher likelihood to offer the high wage if the employer has a higher income outside the laboratory is that money earned in the experiment has a lower marginal utility for the high income employers than for low income employers. If so, paying the high wage is less costly for the richer than for the poorer employer in terms of foregone utility.

Finally, the observed robust performance effect could be explained by "responsibility alleviation" (Charness, 2000). A high performing employer may have more optimistic beliefs about her employees' earning capabilities what then reduces impulses towards generosity. Conversely, a low performing employer may have pessimistic beliefs about earning capabilities what then reinforces existing impulses towards generosity.

3 For further reference, the reader may turn to the ESS (2012) variables coded as "pplhlp" and "ppltrst," respectively.

4 Concluding Remarks

This article presents the results from an intergenerational, mixed-age trilateral gift-exchange game mimicking an employer-employees relationship. We provide controlled laboratory evidence supporting our hypothesis that own performance strongly affects employers' wage setting behavior: higher performance is correlated with higher probabilities of offering rational wages, above and beyond the payoff function specification. Additionally, we find evidence supporting previous findings using field data (Büsch et al., 2009) showing that employers' own age is not a determinant of their wage setting behavior, above and beyond its link to performance. Another novel finding is an income-outside-the-lab-effect for behavior in a laboratory experiment, that is consistent with diminishing marginal utility of wealth.

This article makes one important contribution to the economics literature, which is of practical implication for organizations. Indeed, regardless of the age – thus experience – of the employer, wage setting behavior will depend heavily on how productive employers perceive themselves to be.

Even though we alert that our findings are based on a laboratory experiment, our subjects' sample built up intergenerational teams that had to perform a real effort task. Adding the consistency of results using naturally occurring field data, we believe that our findings may have important implications for the industry. That said, wages enclose employers' own effort and performance.

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