RATIONALITY
& COMPETITION
CRC TRR 190

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Discussion Paper No. 256

September 7, 2020

Collaborative Research Center Transregio 190 | www.rationality-and-competition.de
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Coordination under Loss Contracts *

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August 28, 2020

Abstract

In this paper we study the effects that loss contracts—prepayments that can be clawbacked later—have on group coordination when there is strategic uncertainty. We compare the choices made by experimental subjects in a minimum effort game. In control sessions, incentives are formulated as a classic gain contract, while in treatment sessions, incentives are framed as an isomorphic loss contract. Our results show that loss contracts reduce the minimum efforts of groups and worsen coordination between group members, both leading to lower payoffs. However, these results depend strongly on the group's gender composition; groups with a larger proportion of women are better at coordinating and exert more effort.

Keywords strategic uncertainty, loss aversion, coordination, contract design, framing, experiment

JEL Classification C91 · D84 · G11 · G41

*Corresponding author: lea.bitter@tu-berlin.de. We would like to thank Alex Rees-Jones, Dirk Engelmann, Frank Heinemann, and Muhammed Bulutay for their insightful comments. We also would like to thank Ailin Leng for sharing her z-Tree code with us. All authors acknowledge the financial support from the Deutsche Forschungsgemeinschaft (DFG) through the CRC TRR 190 "Rationality and Competition."

1 Introduction

Coordination lies at the center of most organizational settings. In those contexts, any single member's decision can impact the firm's entire business process. This is apparent in assembly lines or just-in-time inventory systems but also applies to other less obvious settings, such as an advertising company with a shirking graphic designer or a restaurant with an especially slow waiter.

In such organizational settings, having all subjects coordinate on a high effort can be complicated, as individuals face a trade-off: while exerting more effort might result in higher productivity, such effort might be wasted if someone else along the chain (the "weakest link") is not keeping up to speed. One way to mitigate this coordination failure is to increase the monetary benefits from coordination (Brandts and Cooper, 2006); yet, this measure is expensive. A recent, popular, and cost-effective suggestion to increase effort is the use of so-called loss contracts (e.g., Hossain and List, 2012), where individuals are prepaid and then clawbacked if they do not meet certain productivity targets.

The intuition for the application of loss contracts rests on the presence of loss aversion: since losses loom larger than gains, loss-averse individuals will work harder to avoid the loss of a dollar than to gain an additional dollar (e.g., Hossain and List, 2012; Fryer Jr et al., 2012; Imas et al., 2016). However, this intuition relies on a series of restrictive assumptions. For example, most of the previous literature on loss contracts assumes that higher levels of effort guarantees a higher payoff or unambiguously reduces the probability of a clawback. This assumption might hold for some individual decision-making situations but is not realistic in many setups that require groups to coordinate. In a situation with strategic uncertainty (e.g., when productivity relies on the weakest link), the interaction between loss and risk aversion might backfire and induce individuals to exert lower effort.

As shown in Pierce et al. (2020), if the effort strategies of individuals cannot be ordered following a first-order stochastic dominance criteria, then loss contracts might have perverse effects and drive individuals to reduce their efforts. The reason for this is that when losses loom larger than gains, the uncertainty of outcome-related losses might also loom larger than the potential gains, pushing individuals toward low effort "loss-minimizing" strategies. Armantier and Boly (2015) and De Quidt (2017) argue along these same lines to provide conditions under which the introduction of loss contracts might have ambiguous effects on effort provision.

Against this background, we study how loss contracts affect coordinated efforts within groups when strategic uncertainty is present. To do so, we design a between-subject experiment in which subjects play multiple rounds of the "minimum effort game" (Van Huyck et al., 1990), also known as the "weakest link" game (e.g., Knez and Camerer, 1994; Riedl et al., 2016). As in a production chain, in this setup each subject's payoff depends on both her own effort and the lowest effort of all group members. To study the effects of loss contracts, we set up two treatments: a control group with a "classic" *gain contract* and a treatment group with an isomorphic payoff function framed as a *loss contract*. Because the only difference between both treatments is the way in which the payoffs are presented, any change in subjects' behavior can be attributed to the *framing* of the payoff function.

We find that loss contracts result in lower group productivity, with groups exerting a lower minimum effort than in sessions with gain contracts. We also find that loss contracts worsen coordination among group members, which is reflected in a higher variance of the effort choices within the groups. This higher variance translates into a substantial amount of wasted efforts (i.e., individual efforts exceeding the group minimum effort) and therefore translates into lower payoffs across its members. Interestingly, our results show strong gender effects: groups with a larger proportion of women have higher levels of minimum effort, coordination, and payoffs.

Our study contributes to the literature on the effects of negatively framed incentives. While this literature is rich in the effect of loss contracts on individual worker effort (e.g., DellaVigna and Pope, 2018; Imas et al., 2016; Pierce et al., 2020), to the best of our knowledge, only a few papers have studied the effects that such contracts have on group coordination. Hossain and List (2012) study the effects of loss contracts on group productivity in a field experiment and show that loss contracts have strong effects on group productivity. However, in their experiment there is no strategic uncertainty.[1]

In the lab, Cachon and Camerer (1996) study *loss avoidance* and forward induction (implicit communication about subjects' expectations) as an equilibrium selection refinement in median and minimum effort games. Hamman et al. (2007) study the effect of imposing a penalty or bonus conditional on specified outcomes, while Brandts and Cooper (2006) look at the effect that a reduction in previous bonus payments has on co-

[1] As explained in page five of the article, a subset of groups worked around belt lines with a speed that the group could alter or worked around guide rails with a fixed speed. It is unclear if strategic uncertainty existed in the two remaining groups (G3 and G4), but the results for these groups are mixed.

ordination. However, all of these laboratory experiments have different focuses, and with several behavioral aspects at play they cannot determine the isolated effects of negatively framed incentives on group coordination. Our contribution is therefore to study the isolated effects of negatively framed incentives on group coordination and performance in a controlled laboratory environment with strategic uncertainty.

The paper is organized as follows. Section 2 presents our experimental design. Section 3 presents the experiment's results, which are discussed in Section 4. Section 5 concludes.

2 Experimental Design

We design a between-subject experiment with two treatments: a gain contract and a loss contract. In both cases, subjects are divided into groups of six and simultaneously decide how much effort to exert in each given round. Subjects' payoffs are decreasing in their own effort and are increasing in the minimum effort chosen across all subjects in the group. Formally,

$$\Pi(e_i, e_{min}) = ae_{min} - be_i + C, \tag{1}$$

where e_i is the effort of subject i, e_{min} is the minimum effort across all subjects n in the group, a and b are parameters such that $a - b > 0$, and C is a constant to avoid negative payoffs. The parametrization follows Van Huyck et al. (1990), with $a = 20$ points, $b = 10$ points, and $C = 60$ points. The exchange rate at the end of the experiment is €1 for every 70 points, which is comparable to the rate in Engelmann and Normann (2010) and Leng et al. (2018).

Our treatment is implemented through the framing of the payoffs. In the gain contract treatment, subjects are presented with the payoffs resulting from equation (1), as depicted in the left panel of Table 1. The vertical axis of the payoff table denotes the effort choice of an individual subject i. The horizontal axis denotes the smallest effort level chosen by all group members of subject i's group. In the loss contract treatment, subjects are endowed with 140 points before each round and are presented with the right panel of Table 1. Importantly, this second table does not represent a subject's final payoffs but the outcomes of all subjects' joint actions. To calculate the payoffs for each set of actions, subjects need to subtract the resulting outcome from their per-round endowment of 140

Gain Contract

	Minimum Choice within Group						
	7	**6**	**5**	**4**	**3**	**2**	**1**
7	130	110	90	70	50	30	10
6		120	100	80	60	40	20
5			110	90	70	50	30
4				100	80	60	40
3					90	70	50
2						80	60
1							70

Loss Contract

	Minimum Choice within Group						
	7	**6**	**5**	**4**	**3**	**2**	**1**
7	–10	–30	–50	–70	–90	–110	–130
6		–20	–40	–60	–80	–100	–120
5			–30	–50	–70	–90	–110
4				–40	–60	–80	–100
3					–50	–70	–90
2						–60	–80
1							–70

Table 1: Payoff tables presented to subjects. In both cases, rows represent own effort and columns represent the group's minimum effort. The left panel shows the control treatment where subjects see their final payoff in points, and the right panel shows the treatment table. Here, points are subtracted from subjects' initial endowment (140) and not from final payoffs.

points.[2] This is made clear in the instructions. In both treatments, subjects had several practice rounds to get acquainted with the game's interface and payoff structure.

In both tables the values presented are either all positive or all negative. We choose this modeling device to avoid the creation of any focal points that may attract subjects' attention and bias their behavior.[3]

The game is played for ten consecutive rounds, maintaining the same group composition. After each round, subjects receive feedback about the group's minimum effort and the resulting payoff. After the ten rounds, we elicit several personality traits from our subjects. First we measure subjects' cognitive ability using the CRT (Frederick, 2005), CRT2 (Thomson and Oppenheimer, 2016), and eCRT (Toplak et al., 2014) questions. Then we elicit their risk aversion, ambiguity aversion, and loss aversion through modifying the multiple price lists used in Rubin et al. (2017). Finally, subjects answer the short version of the Big Five personality traits suggested by Rammstedt and John (2007) and state their gender.

The experiment was run at the Experimental Economics Laboratory of the Technische Universität Berlin. We had eight sessions, four with gain contracts and four with loss contracts. In each session we randomly divided subjects into 3 groups of 6 subjects for a

[2]The interface included a calculator in case any subject needed it.

[3]Cachon and Camerer (1996) show that in minimum effort games with negative and non-negative outcomes, the latter act as focal points. Consequently, subjects avoid losses by ignoring all strategies that result in negative outcomes. Showing only positive or only negative entries allows us to exclude such *loss avoidance* as potential equilibrium selection principle.

total of 12 independent groups per treatment and 144 subjects across all sessions. Sessions lasted less than one hour, with average earnings of €12.74. All subjects were recruited through ORSEE (Greiner, 2015), and the experiment was programmed and conducted using z-Tree (Fischbacher, 2007).

3 Results

Figure 1 summarizes the results across all sessions and groups. In it, we present the minimum choice of each group in each period (thin gray lines) and the mean minimum choice across groups in each period (thick red line). Contrary to the hypothesis of Hossain and List (2012), the figure shows that a loss contract reduces the average minimum effort of groups. While a Mann-Whitney U test detects no significant effect between the treatments for initial period decisions (p-value $= 0.325$), there seem to be some differences in the last period (p-value $= 0.082$).

The differences between treatments become more apparent once we look at the data in a more disaggregate way. In Table 2 we use a random effects model with the per-group minimum effort for each period as the dependent variable. In all cases we control for the ratio of women per group ($female\_ratio$) as well as the average value of different personality traits (e.g., $avg\_risk\_aversion$ is the mean value of the risk aversion across all subjects of a group). The results show that a loss contract has a *negative effect* on the minimum effort of each group. This effect is significant at the 5% level and is consistent with the drop in effort that we observe in Figure 1. Therefore from Table 2, we conclude that a loss contract brings down the minimum effort of groups.

Result 1: A loss contract results in a lower minimum effort of groups.

Table 2 also shows that the groups' gender composition has a strong effect on the minimum effort. This statistically and economic significant effect stands out from all other group characteristics, except for extraversion, which has a negative effect on groups' minimum effort.

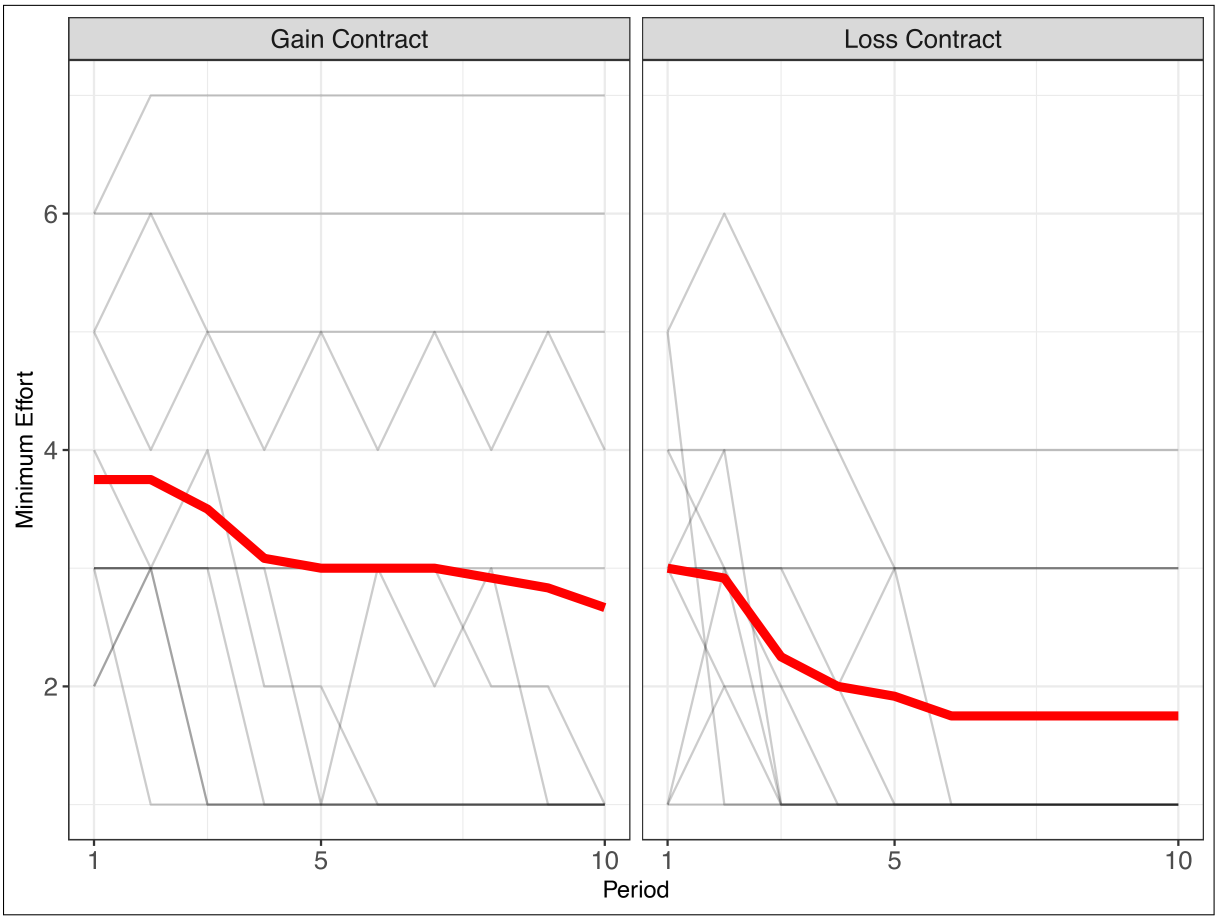


Figure 1: Summary of all choices across treatments. For both treatments, the thin gray lines represent the minimum effort played in each group, and the thick red line is the mean of this minimum effort.

	(1) periodmineffort	(2) periodmineffort
loss_contract	–1.151*	–1.272**
	(0.691)	(0.640)
female_ratio	2.644**	3.857***
	(1.163)	(1.163)
avg_risk_aversion	–0.279	–0.595*
	(0.274)	(0.317)
avg_loss_aversion	–0.175	–0.342
	(0.202)	(0.259)
avg_ambiguity_aversion	0.00392	–0.0640
	(0.303)	(0.400)
avg_CRT	0.255	0.290
	(0.182)	(0.206)
avg_extraversion		–0.561**
		(0.271)
avg_conscientiousness		0.139
		(0.513)
avg_agreeableness		0.579
		(0.693)
avg_neuroticism		0.188
		(0.539)
avg_openness		0.244
		(0.372)
constant	4.325	4.579
	(3.143)	(5.593)
N	240	240

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Random effects GLS. All standard errors are clustered at the group level.

3.1 Coordination

In this section we analyze how loss contracts affect subjects' coordination within groups. To do so, in Table 3 we study the variance of the individual effort levels within each group. In Columns (1) to (3) we regress the variance of all effort choices, across all rounds, for each group (*varagg* in Table 3) on a set of controls using OLS. Again, the main control variables are the ratio of women per group ($female\_ratio$) and the average value of the different personality traits. In Columns (4) to (6) we use a random effects model where the dependent variable is the variance within each group for *each period* while controlling for the composition of each group. The results are very similar for both models: a loss contract results in higher variance in the effort choices of subjects within groups.

Result 2: A loss contract results in less coordination (larger variance) of effort choices within groups.

Again, group composition has a strong influence on how groups behave; those with a higher share of women have much less dispersed effort levels and a lower effort variance.

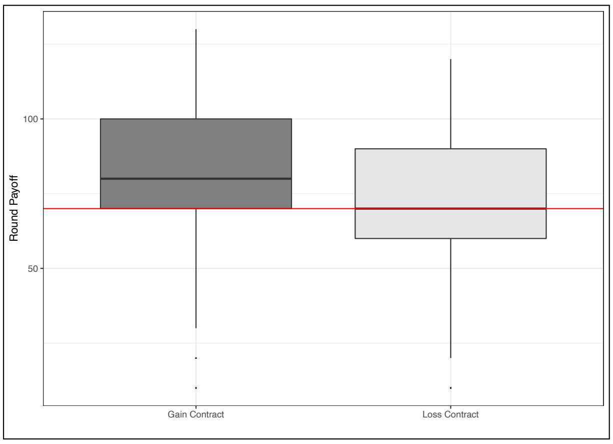
	OLS			Random Effects GLS		
	(1) varagg	(2) varagg	(3) varagg	(4) varaggt	(5) varaggt	(6) varaggt
loss_contract	1.127	1.430*	2.533***	0.587	0.686*	0.986***
	(0.715)	(0.758)	(0.790)	(0.428)	(0.410)	(0.230)
female_ratio	–3.082**	–2.188	-7.088**	–1.351*	–0.538	–3.024***
	(1.459)	(1.792)	(2.369)	(0.809)	(0.932)	(0.595)
avg_risk_aversion		–0.461	0.211		–0.422*	0.0845
		(0.508)	(0.568)		(0.230)	(0.173)
avg_loss_aversion		0.455*	0.244		0.242*	0.305**
		(0.237)	(0.308)		(0.127)	(0.122)
avg_ambiguity_aversion		0.440	0.760		0.198	0.240
		(0.475)	(0.485)		(0.194)	(0.175)
avg_CRT		–0.311	–0.237		–0.249***	–0.198**
		(0.214)	(0.228)		(0.0868)	(0.0815)
avg_extraversion			1.095*			0.932***
			(0.568)			(0.159)
avg_conscientiousness			–1.584**			–0.534**
			(0.629)			(0.250)
avg_agreeableness			–0.294			–0.455*
			(0.628)			(0.270)
avg_neuroticism			0.445			0.0243
			(0.491)			(0.259)
avg_openness			–0.191			–0.0792
			(0.469)			(0.181)
constant	3.556***	0.828	–1.011	1.973***	2.745	–1.092
	(0.743)	(3.758)	(6.188)	(0.442)	(2.038)	(2.357)
N	24	24	24	240	240	240

Standard errors in parentheses

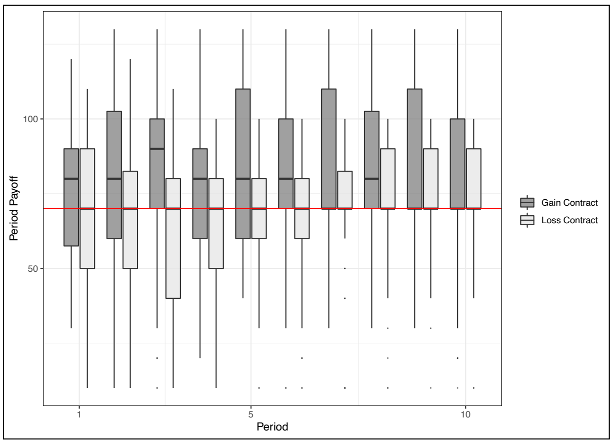
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Analysis of the aggregate variance in effort choices using OLS and random effects GLS. All standard errors are clustered at the group level.

3.2 Payoffs



(a) Payoffs across Treatments



(b) Payoffs per Period

Figure 2: Payoffs. The left panel presents the boxplots for the payments across treatments. The right panel disaggregates the data by period and treatment.

In this section we analyze how loss contracts affect subjects' payoffs. To do so, we first plot in the left panel of Figure 2 the per-period payoff of all subjects across both treatments. The figure shows that the median per-period payoff is higher under gain contracts than under loss contracts. In fact, the median payoff across all periods under loss contracts is 70 experimental units, exactly equal to the payoff of the risk-dominant equilibrium (i.e., effort level 1).[4,5] We mark the payoff of 70 experimental units with a horizontal red line in Figure 2.

In the right panel of Figure 2 we plot subjects' payoffs for each period. The panel shows that under loss contracts, the median payoff is of 70 experimental units *in each single period*, while it is greater than 70 in most periods under gain contracts. Another interesting feature of this panel in Figure 2 is how the variance in payoffs seems to decrease as the experiment advances under loss contracts but not under gain contracts.

To quantify the effects of loss contracts on payoffs, in Table 4 we present two random effects models. The left table shows how the framing of contracts and subjects' personality traits affect individual payoffs. In the right table we study the effects of contract framing and group composition on payoffs. Both models confirm our above result; a loss contract

[4] There are other combinations by which a subject might get 70 experimental units. However, exerting the minimum effort is the only way a subject can guarantee these 70 experimental units.

[5] Figure 4 in the appendix shows the same plot as Figure 2 but is disaggregated by gender. In it, we see how with the median payoff for women is higher under both gain and loss contracts.

Individual Characteristics		Group Characteristics	
	ind_payoff		ind_payoff
loss_contract	–12.58*	loss_contract	–15.71**
	(7.408)		(7.277)
female	8.374*	female_ratio	49.12***
	(4.581)		(13.86)
risk_aversion	0.204	avg_risk_aversion	–5.675
	(0.531)		(3.852)
ambiguity_aversion	0.00524	avg_ambiguity_aversion	–1.498
	(0.391)		(4.567)
loss_aversion	–0.166	avg_loss_aversion	–4.497
	(0.404)		(3.068)
CRT	0.812	avg_CRT	3.630
	(0.653)		(2.396)
openness	–0.173	avg_openness	2.760
	(0.721)		(4.494)
neuroticism	–0.538	avg_neuroticism	1.349
	(1.454)		(6.526)
agreeableness	–0.760	avg_agreeableness	6.424
	(1.260)		(8.124)
conscientiousness	0.144	avg_conscientiousness	3.224
	(1.271)		(6.220)
extraversion	–0.210	avg_extraversion	–8.973***
	(0.753)		(3.274)
constant	82.14***	constant	109.0
	(22.20)		(66.53)
N	1,440	*N*	1,440

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Random effects GLS. All standard errors are clustered at the group level.

is detrimental to subjects' payoffs. This is especially significant once we control for group characteristics rather than individual ones.

Again, we find significant gender effects for payoffs. First, women generate higher individual payoffs than their male counterparts (left table of Table 4). Second, those groups with a higher share of women see significantly higher individual payoffs for all group members (right table of Table 4).

Result 3: A loss contract results in lower payoffs.

To gain a better understanding of this result, we take a closer look at the single determinants of payoffs. According to the payoff function (1), subject i's payoffs in period t depend positively on the group output determined by the minimum effort exerted by subject i's group at period t ($mineffort_{g,t}$), and they depend negatively on the excess effort provided by subject i at period t above the group's minimum effort. The reason for the latter is that whenever a subject exerts a higher effort than the group's minimum effort (i.e., $e_{i,t} > e_{min,g,t}$), the difference between the group's exerted effort and the minimum effort is "wasted" and is not used to "produce" any output. To formalize the concept of wasted effort, we define the *wasted effort* of each subject i at period t as

$$waste_{i,t} = e_{i,t} - e_{min,g,t}. \tag{2}$$

Note that $waste_{i,t}$ can only take positive values, with a minimum of zero whenever a subject is exerting the group's minimum effort. Therefore, $waste_{i,t}$ is an important measure of efficiency that captures the degree to which subjects can coordinate on the same effort level. Consequently, the payoff-dominant equilibrium (i.e., effort level 7) is characterized by zero wasted effort of all group members.

The left and right tables of Table 5 present two random effects models of how individual wasted efforts are determined by the framing of contracts and by either subjects' personality traits (left table) or the group composition (right table). In the left table we see no effects of loss contracts on the level of wasted efforts. However, once we control for group characteristics (right table), loss contracts have a significant and positive effect on the amount of individual wasted efforts.

Individual Characteristics

	waste
loss_contract	0.210
	(0.182)
female	–0.281*
	(0.166)
risk_aversion	–0.0184
	(0.0209)
ambiguity_aversion	–0.00181
	(0.0185)
loss_aversion	–0.00857
	(0.0151)
CRT	–0.0283
	(0.0173)
openness	0.00331
	(0.0297)
neuroticism	0.0414
	(0.0545)
agreeableness	0.0755**
	(0.0378)
conscientiousness	–0.0376
	(0.0410)
extraversion	0.0368
	(0.0295)
constant	0.822
	(0.636)
N	1,440

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Group Characteristics

	waste
loss_contract	0.299**
	(0.142)
female_ratio	–1.055**
	(0.449)
avg_risk_aversion	–0.0271
	(0.127)
avg_ambiguity_aversion	0.0858
	(0.109)
avg_loss_aversion	0.107
	(0.0699)
avg_CRT	–0.0734
	(0.0515)
avg_openness	–0.0324
	(0.104)
avg_neuroticism	0.0528
	(0.153)
avg_agreeableness	–0.0632
	(0.155)
avg_conscientiousness	–0.184
	(0.154)
avg_extraversion	0.336***
	(0.0972)
constant	–0.316
	(1.424)
N	1,440

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Random effects GLS. All standard errors are clustered at the group level.

Result 4: A loss contract results in a higher amount of wasted efforts.

We can therefore conclude that in our setup, loss contracts unambiguously reduce payoffs. Moreover, this payoff reduction comes through two channels: a decrease in the minimum effort of groups (Result 1) and an increase the individual level of wasted efforts.

4 Gender Effects

Given the strong gender effects detected in our analysis, we briefly analyze the influence of gender despite the fact that the experiment was originally not designed for this purpose. Our results show that groups with a higher share of women coordinate on higher effort levels (Table 2) and produce less wasted effort (Table 4), and consequently they have a higher average payoff (Table 4).

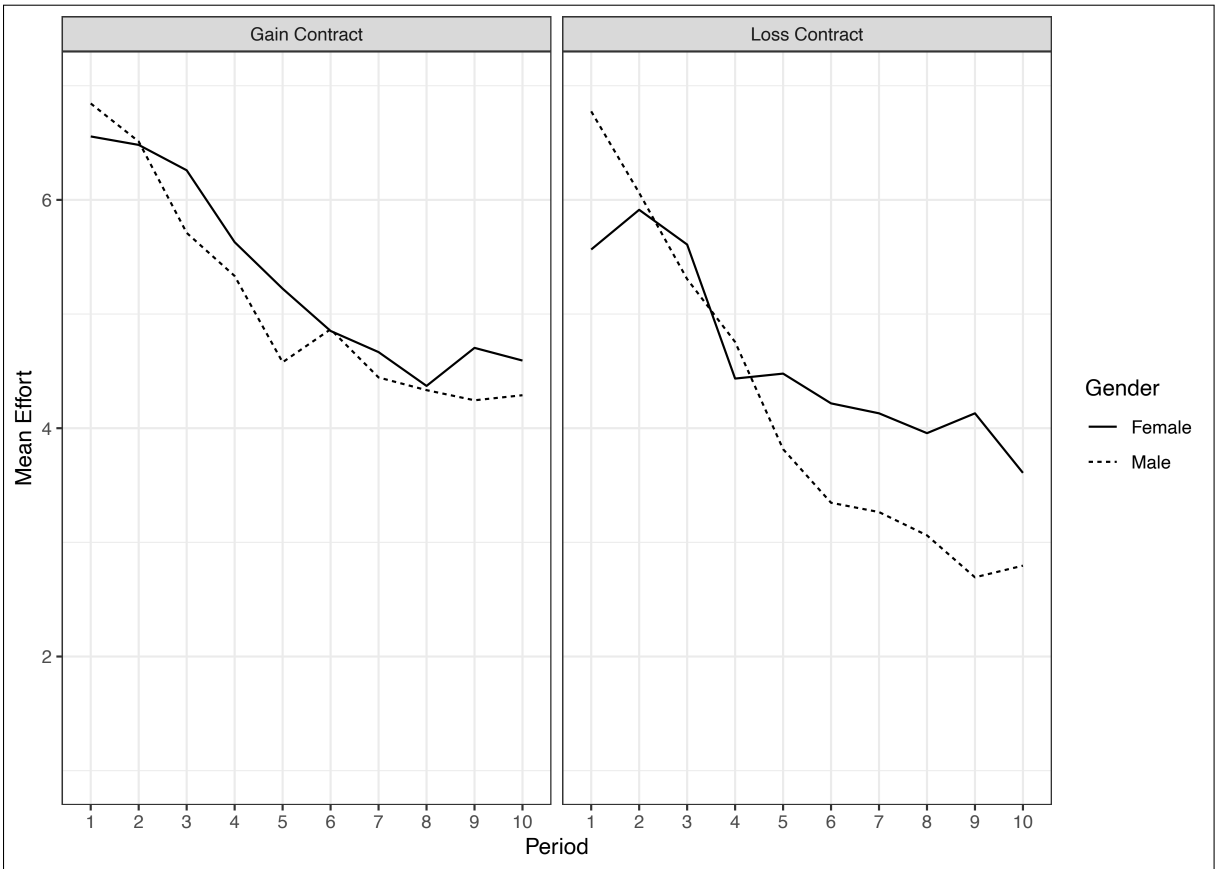


Figure 3: Mean effort decisions by gender and treatment. The left panel shows the mean effort decision of all women per round (solid line) and the mean effort decisions of all men per round (dashed line) for gain contracts. The right panel shows the same for loss contracts.

In Figure 3 we plot the average choices of women and men in each period for both treatments. The figure shows that most of the gender differences come from the loss contract treatment. A series of Mann-Whitney tests confirm this. We cannot reject that women and men exert the same level of effort at the beginning of the session (p-value = 0.342) under gain contracts. However, under a loss contract, we find strong differences in the effort choices between genders for the session's first period (Mann-Whitney p-value = 0.007).[6] Moreover, under loss contracts, the differences across gender reverse from the beginning to the end of the experiment: while men exert significantly more effort in the first period, by the end of the session, they exert considerably less effort than women.

Such reversion becomes clear in Table 6, where we run a GLS interacting the ratio of women with the period. The first column shows that gender has no effect on the way groups' minimum effort evolves during the session. In the second column, however, we see a strong positive effect of the interaction between the ratio of women and the period. In other words, the results of the second column of Table 6 show that as the sessions progress under loss contracts, groups with a larger proportion of women have a higher minimum effort.

Our finding from the gain contract treatment that there are no gender differences are in line with the existing literature on gender effects in coordination games with strategic complements (e.g., Dufwenberg and Gneezy, 2005; Heinemann et al., 2009; Engelmann and Normann, 2010; Di Girolamo and Drouvelis, 2015). However, the differences we observe under loss contracts seem to indicate that this might not be a generalizable result. Unfortunately, our data are not adequate to go beyond these initial indications of gender effects under loss contracts.[7] Yet, we do believe that our data point to some interesting effects, and we plan on studying them in the future.

[6]Notice we cannot run a Mann-Whitney using any *individual observations* beyond the first period, as they cease to be independent.

[7]For example, the number of groups composed only of men in control is one, while in treatment it is three, and no group is composed only of women.

	Gain Contract periodmineffort	Loss Contract periodmineffort
female_ratio	3.619	2.168***
	(7.383)	(0.778)
period	–0.143***	–0.226***
	(0.0452)	(0.0574)
female_ratio × period	0.0690	0.273***
	(0.106)	(0.0947)
avg_risk_aversion	–3.869	–0.168
	(2.414)	(0.250)
avg_loss_aversion	2.018	–0.173**
	(1.361)	(0.0775)
avg_ambiguity_aversion	2.421	–0.0471
	(1.787)	(0.181)
avg_CRT	2.921***	0.333
	(0.743)	(0.228)
avg_extraversion	4.475***	–0.334**
	(1.248)	(0.157)
avg_conscientiousness	–1.067	0.219
	(1.248)	(0.364)
avg_agreerableness	3.135***	1.319***
	(0.851)	(0.334)
avg_neuroticism	2.913***	–0.415
	(0.846)	(0.284)
avg_opennes	–7.706**	0.747**
	(3.643)	(0.366)
constant	–31.58***	–7.601**
	(8.755)	(3.847)
N	120	120

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Random effects GLS by treatment. In the first column, we use only data from gains contract sessions; in the second column we use data only for loss contract sessions. The dependent variable is the minimum effort of each group. All standard errors are clustered at the group level.

5 Conclusion

Coordination lies at the center of most organizational settings. The timing and quality of many production chains depend on the coordinated efforts of all of its members. From sophisticated just-in-time inventory systems to co-authored scientific research papers, we all depend crucially on the chain's weakest link.

One suggested way to increase effort in the workplace is to present incentives in the form of loss contracts, where workers are paid a bonus beforehand that they must pay back later if they do not meet the required productivity threshold. The literature studying such loss contracts at the individual level is large (e.g., Hossain and List, 2012; DellaVigna and Pope, 2018; De Quidt, 2017) and, while inconclusive, points toward loss contracts increasing worker productivity. However, in all of these cases, workers know that an increase in effort is associated with a lower probability of losing the bonus. This might not resemble many organizational settings that require coordination in sophisticated environments with diffuse responsibilities. In this context, the presence of strategic uncertainty might push individuals to low effort strategies to reduce their "exposure" to potential losses.

We recreate such an environment in the lab using the highly stylized minimum effort game (Van Huyck et al., 1990). Our results show that in a minimum effort setup, loss contracts reduce the minimum effort of groups. This reduction in effort has strong welfare effects, as groups are less "productive" and their effort levels are less coordinated, resulting in higher levels of "wasted efforts" and therefore lower individual payoffs.

We also find strong gender effects. Groups with a larger proportion of women have higher minimum effort levels, are more coordinated, and thus have higher payoffs. Yet, these results seem to be driven mostly by gender differences in the loss contract sessions. Hence, the evidence from the existing literature that gender does not show any effects in coordination games with strategic complements (e.g., Dufwenberg and Gneezy, 2005; Heinemann et al., 2009; Engelmann and Normann, 2010; Di Girolamo and Drouvelis, 2015) does not seem to generalize to loss contracts.

Numerous studies observe that negatively framed incentives increase participant productivity (e.g., Hossain and List (2012), Fryer Jr et al. (2012), and Hong et al. (2015) in the field and Armantier and Boly (2015), De Quidt (2017), and Hannan et al. (2005) in the lab. However, in our setup and that of Pierce et al. (2020), negatively framed incentives deteriorate participants' productivity. This divergence in results indicates that negatively framed incentives cannot be regarded on their own but instead need to be evaluated in the context of their environment. Some settings might call for introducing loss contracts, while in others, implementing clawback policies might result in destructive results. As the literature stands, there is no general answer to whether loss contracts are superior to gain contracts. Rather, each particular situation requires a careful study of all participants' incentives and interaction before deciding which of the two contracts is best to implement.

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A Extra Figures

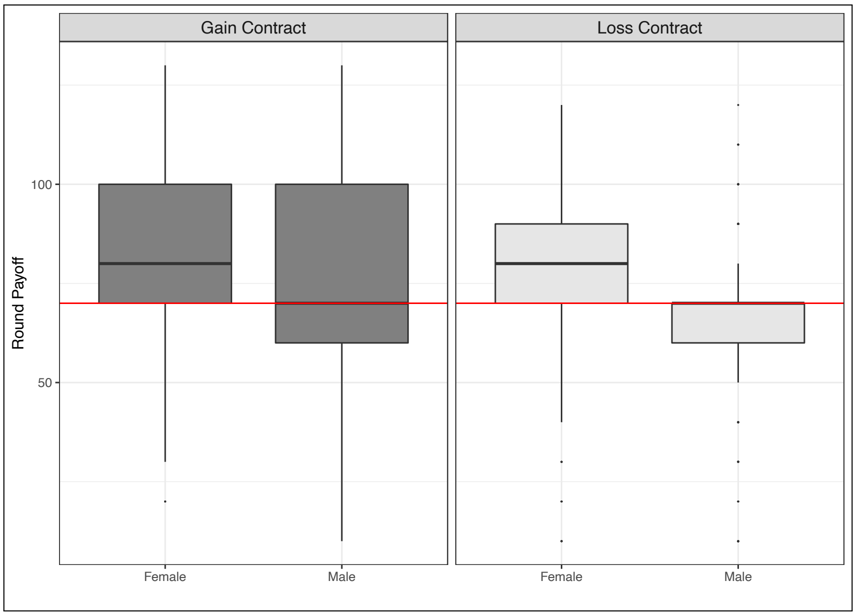

Figure 4: Payoff across genders. Boxplots comparing subjects' payoffs (vertical axis) across treatment and gender.