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Are people conditionally honest? The effects of stakes and information about others' behavior

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Preliminary draft
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Abstract

We study theoretically and empirically how monetary incentives and information about others' behavior affects dishonesty. We ran a laboratory experiment with 560 participants inspired by the “observed game” developed by Kajackaite and Gneezy (2017). We find that the extensive (the fraction of liars) and intensive (the size of the lie) margin of dishonesty decrease when stakes are very high. On average, information about others slightly increases the fraction of liars but has no effect on the size of the lie. Distinguishing subjects by their belief on others' behavior, we find that information decreases the fraction of liars among over-estimators and increases the fraction among under-estimators. This pattern is the same across payoff levels.

JEL-Classification: C91, D03, D78.

Keywords: Laboratory experiment, theory, cheating, incentives, information, moral costs, lying costs

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1. Introduction

Dishonesty is a major concern of modern societies. Cheating in exams, fare dodging, doping in sports, inflation of the curriculum vitae, questionable research practices, tax evasion, misrepresentation of output at work, and other fraud of any kind, generate large costs to the affected institutions and the general public. Dishonesty is at the heart of the principal-agent problem. It can cause substantial damage by eroding trust, creating uncertainty, reducing efficiency, and harming collaboration. Given the important economic consequences of dishonesty, understanding the factors that influence dishonest behaviors is important. The aim of our paper is to examine how dishonesty is affected by monetary incentives and information about others' behavior.

Economists have been working on the determinants of dishonesty for decades. Traditionally, it is assumed that cheating results from a comparison of the expected pecuniary costs and benefits associated with honest and dishonest behavior (Becker, 1968). However, standard models do a poor job in explaining dishonesty. Indeed observed cheating is usually much higher than predicted (e.g., Abeler et al., 2019). The results suggest that the decision to cheat not only depends on the pecuniary benefits but also on many other determinants. In particular, the moral costs of cheating (i.e., costs not based on strategic considerations) should be incorporated in economic models to increase their validity. Although behavioral economics has recently enriched the economics-of-crime approach, many questions remain unanswered.

A question that has puzzled researchers since long is if dishonesty varies with the stakes. On the one hand, it could be the case that people lie more, because the monetary incentives are higher. On the other hand, it is possible that they lie less because their moral costs increase. The empirical evidence is not clear-cut. According to the meta-study by Abeler et al. (2019), an increase in the potential payoff from misreporting affects dishonesty very little. Some papers find that dishonesty increases when monetary stakes are increased (Kajackaite and Gneezy, 2017), some observe the opposite effect (e.g., Balasubramanian et al., 2017; Cohn et al., 2019), others find no relationship with stakes (Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013; Andersen et al., 2018). A related literature shows that the true state, i.e., how much would be honestly earned, strongly influences behavior (Gibson et al., 2013; Gneezy et al., 2013, 2018a). The literature focuses on the extensive margin of dishonesty, i.e., the fraction of liars. However, payoffs may also influence the extent to which those that cheat exaggerate. Furthermore, to our knowledge, the effect of payoffs on the intensive margin, i.e., the size of the lie, has not yet been studied.

Another important question concerns the role of information on dishonesty. Precisely,

to what extent is dishonest behavior contagious? The theory of social customs assumes that a deviation from a social norm by a few people can produce the erosion of the norm in the long run (e.g., Akerlof 1980, Corneo 1995). However, evidence on the influence of others' behavior on cheating is also not clear cut. While Diekmann et al. (2015) find that confronting subjects with others' behavior increases cheating, Kroher and Wolbring (2015), Rauhut (2013) and Abeler et al. (2019) find no such effect. Distinguishing subjects by their beliefs about others' dishonesty in the respective period, Rauhut (2013) shows that over-estimators reduce dishonesty when they are informed about others' actual behavior while under-estimators increase dishonesty. The papers do not distinguish the extensive and intensive margin of dishonesty. In addition, it has not yet been studied if the effect of information about others' behavior varies with the monetary incentives.

In the current paper, we contribute to the existing literature by investigating the role of monetary incentives and information about others' behavior on dishonesty. For this purpose, we present a theoretical model and a laboratory experiment in which we distinguish the extensive (being dishonest) and intensive margin (size of lie conditional on being dishonest) of dishonesty.

In our theory, agents compare the costs and benefits of being dishonest given the size of the offense. Our model predicts that the impact of payoffs (reflected by the marginal value of over-reporting one unit) on the probability of lying and the size of offense depends on the shape of moral costs. If moral costs are convex, the probability of lying and the size of the offense decrease with payoffs. If moral costs are concave, only the probability of detection is affected. We assume that agents consider others' behavior in their decision to be dishonest but they are imperfectly informed. Hence, the impact of providing information about others' behavior depends on subjects' belief. If they were previously underestimating dishonesty they increase dishonesty if they were previously overestimating they decrease dishonesty.

Our experiment tests our theoretical predictions. In the experiment, participants have to report a number they saw behind a box they randomly clicked on. The payoffs depend on the self-reported number. Unlike several previous studies our game allows observing cheating at the individual level. Another originality of our paper is that we observe the individuals' decisions for several periods which allows us to capture convergence process and measure the role of social contagion.

To anticipate our findings, we observe that (1) in line with a growing body of literature, individuals cheat less than rational agents would do; (2) the majority of people who lie, lie to the maximum extent. (3) individuals cheat less both at the extensive and intensive margin when monetary incentives increase sharply; (4) Information about the decisions of others has

on average a weak impact on dishonesty and a strong effect if we distinguish by subjects beliefs; (5) the effect of information about others does not increase with payoffs.

The remainder of the paper is as follows. Section 2 reviews the related literature. Section 3 develops a theoretical framework. Section 4 describes the experimental design. Section 5 provides the empirical results. Section 6 provides a discussion and the conclusion.

2. Related literature

According to the standard economic model of crime, an individual maximizes the expected material payoff when choosing between honest and dishonest behavior (e.g., Becker, 1968). In conflict with this prediction, a large body of experimental studies finds that individuals do not fully exploit their opportunities of cheating (recent overviews are given by Gerlach et al., 2019; Abeler et al., 2019). The results suggest that lying is intrinsically costly.

While the standard economic model of crime predicts that people lie more when material payoffs are higher, this is far from obvious when one considers that people have intrinsic cost of lying. Several studies investigate the relationship between payoffs and dishonesty in non-strategic settings.¹ The majority of studies do not find a relationship between dishonesty and payoffs (Mazar et al., 2008; Wiltermuth, 2011; Fischbacher and Föllmi-Heusi, 2013; Gino et al., 2013; Andersen et al., 2018; Hugh-Jones, 2016). The meta-study by Abeler et al. (2019) also finds that an increase in the potential payoff from misreporting affects dishonesty very little. The studies argue that lying cost increase with the magnitude of rewards (e.g., Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013).² However, while Kajackaite and Gneezy (2017) find no variation with stakes in a classic cheating game, they observe an increase of dishonesty in a modified cheating game (mind game) where concerns about being observed as a liar are ruled out. The result suggests that despite the absence of a monitoring and penalty system the subjective perception of being caught may matter for behavior. Balasubramanian et al. (2017) find a hump-shaped relationship of dishonesty and

¹Another paradigm with a strategic component is the deception game, in which a sender has private information regarding payoffs associated with each of the choices that a receiver faces. The sender sends a message to the receiver that could be true or false, and the receiver makes a choice that determines the payoffs for both players. Several studies observe that senders are more likely to lie when the incentives to do so are increased (e.g., Gneezy, 2005; Sutter, 2008; Dreber and Johannesson, 2008; Erat and Gneezy, 2012). However, it has to be considered that these studies conflate distributional preferences and lying cost as lying affects not only absolute payoffs but also relative payoff compared to another individual. Similarly, using a field experiment, Cohn et al. (2019) show that lost wallet are more likely to be returned if the amount of money increases. They argue that theft aversion and altruistic concerns for the owner increase with money.

²For instance, individuals might care about the harm imposed on the experimenter (Gneezy, 2005; Fischbacher and Föllmi-Heusi, 2013).

payoffs and argue that reference points (expected income) could drive the effect.

WHERE TO PUT? The literature discusses whether there are different types of individuals. Hurkens and Kartik (2009) argue that there are two types of cheaters. either a person will never lie, or a person will lie whenever she prefers the outcome obtained by lying over the outcome obtained by telling the truth. “Ethical types” seem to incur high moral cost of cheating such that their behavior is (almost) always honest independent of the incentives. “Economic types” seem to have zero cost of lying such that they are (almost) always dishonest. The majority of people are assumed to lie between these extremes. These people cheat conditional on the benefits exceeding the cost of dishonesty. Hilbig and Thielmann (2017) conclude from their study involving payoffs up to 150\$ that there are four types: 1) individuals that cheat independent of the payoff, 2) individuals that lie more when payoffs increase, 3) individuals that lie less when payoffs increase, 4) individuals that are honest even when stakes are very large.

A related literature studies the effect of what would be honestly earned (true state). Gneezy et al. (2013) and Andersen et al. (2018) find that lying is less frequent when the honest payoff increases. Similarly, Gibson et al. (2013) find that lying increases from 21% up to 82%, when the economic costs of truthfulness are increased. Gneezy et al. (2013) and Andersen et al. (2018) are also able to study the intensive margin of dishonesty. They find that the majority of participants who lie do so to the full extent. However, Gneezy et al. (2013) find that a low true state implies in 10% of cases that dishonesty is less than the full extent.

Another direction of the literature about cheating concerns the role of social norms and social comparisons (see the overview of Abeler et al., 2019). Other people’s rule violations make this kind of behavior become more acceptable (E.g. Cialdini)

In this literature, moral costs are assumed to be affected by the extent to which others are, or are believed to be, honest. Regarding the influence of others on cheating the empirical evidence is also not clear cut. In the context of a tax evasion game, Fortin et al. (2007) investigate whether cheating is influenced by information about average tax evasion in the previous round. No evidence for dynamic social learning effects is found. Using a two-period lab experiment, Diekmann et al. (2015) find that confronting subjects with others’ cheating in the first round increases cheating in the second round. In contrast, Kroher and Wolbring (2015) do not find any significant effect of showing subjects the prevalence of cheating in other experiments. Rauhut (2013) finds that, on average, cheating does not change over four rounds if participants receive information about others’ behavior in the previous round. However, distinguishing subjects by their beliefs about others’ dishonesty in the respective period, Rauhut (2013) shows that over-estimators reduce dishonesty when they are informed

about others' behavior while under-estimators increase dishonesty. Abeler et al. (2019) prime subjects by asking about the behavior of hypothetical participants in the experiment. While they successfully anchor subjects to think about others who reported the high state more or less often, the difference in beliefs does not imply differences in behavior.

3. Model of rule violation behavior

3.1. General setting

Consider a set of agents who must choose in period t whether to be honest or dishonest. To capture the essential features of rule violation behavior, we assume that honesty yields an exogenous reward y_H while the payoff $y_D = y_D(a)$ each dishonest agent receives depends on the type of action a taken. The possible actions are ranked on a common scale, from minor offense \underline{a} to major transgression \bar{a} . For instance, in our cheating experiment, each player will observe a random number and can either report truthfully his/her state of nature, and get paid y_H , or report a higher state, and get paid $y_D(a)$ according to the size a of the lie. To fit our design, we consider a linear payoff function such that $y'_D > 0$ and $y''_D = 0$, i.e., fraudulent payoffs increase proportionally with the size of offense.

We use the binary variable $d_{i,t} \in \{0, 1\}$ to model agent i 's decision to be dishonest in period t . As such, we make a distinction between being dishonest (*extensive margin*, $d_{i,t}$) and the magnitude of dishonesty (*intensive margin*, $a_{i,t}$).

The final decision to take the unethical path results from a comparison of each action's net monetary benefit and moral costs. Consistent with random utility theory (see, e.g., Busemeyer and Rieskamp, 2014), variations in behavior may be due to randomness. For any action $a_{i,t}$, agent i prefers dishonesty ($d_{i,t} = 1$) over honesty ($d_{i,t} = 0$) if:

$$\underbrace{EU(y_D(a_{i,t}), \pi_i, f) - U(y_H)}_{\text{Net monetary benefit}} - \underbrace{k_i - W(a_{i,t}, y'_D) - V(\hat{\beta}_{i,t})}_{\text{Moral costs}} > \delta_{i,t}, \quad (1)$$

where $\delta_{i,t}$ stands for a noise term that is independently distributed over time and across agents.

The net monetary benefit is expressed as the difference between the expected utility of dishonesty $EU = \pi_i U(y_D - f) + (1 - \pi_i) U(y_D)$ and the utility of honesty $U(y_H)$, where π_i is the subjective probability of being sanctioned and f the level of that sanction if caught. Following the literature, moral costs consist of three components:

Fixed cost, k_i .³ Agents are characterized by (unconditional) Kantian morality. They

³See, e.g., Funk (2005), Figuères et al. (2013), Kajackaite and Gneezy (2017), Abeler et al., (2019), Le

derive an exogenous utility loss when being dishonest and are heterogeneous with respect to that level.

*Variable cost, W .*⁴ Moral costs increase with offense level $a_{i,t}$ as the agents might worry more about the signal they convey to themselves or to others ($W_1 > 0$). These costs also depend positively on y'_D , the euro value of one unit of offense ($W_2 > 0$).

*Norm-dependent cost, V .*⁵ Moral costs of agent i decreases with his/her beliefs $\hat{\beta}_{i,t}$ about the fraction of others being dishonest in period t ($V' < 0$).

For simplicity of exposition, we assume risk-neutrality, i.e., constant marginal utility.⁶ The optimal offense conditional on being dishonest, denoted $a_{i,t}^*$ hereafter, is derived from the maximization of the left-hand side of equation 1. In the case of convex moral costs (interior solution), the first-order condition yields:

$$y'_D U' = W_1(a_{i,t}^*, y'_D). \quad (2)$$

The optimal offense level depends on y'_D . Instead, with concave moral costs (corner solution), it is invariant to changes in external factors:

Proposition 1. Optimal offense level $a_{i,t}^*$

If moral costs are strictly convex ($W_{11} > 0$), dishonest agents favor an intermediate offense level. If moral costs are concave ($W_{11} \leq 0$), they tend towards major offense: $a_{i,t}^ = \bar{a}$.*

Let F be the (continuous and increasing) cumulative distribution of the noise term $\delta_{i,t}$. From equation 1, the probability $P_{i,t}$ that agent i is dishonest in period t is given by:

$$P_{i,t} = \Pr(d_{i,t} = 1) = F \left(EU(y_D(a_{i,t}^*, \pi_i, f)) - U(y_H) - k_i - W(a_{i,t}^*, y'_D) - V(\hat{\beta}_{i,t}) \right). \quad (3)$$

A null probability of being sanctioned (or equivalently a null sanction) does not imply that all agents will be dishonest. First, those with a higher Kantian morality k_i will be less prone to ethical violations. Second, moral costs are endogenous to offense levels ($a_{i,t}^*$), monetary incentives (y_H, y'_D) and beliefs about others' behavior ($\hat{\beta}_{i,t}$). The importance of these items is further investigated in the next two sections.

Maux et al., (2019).

⁴See, e.g., Litina and Palivos (2016), Gneezy et al. (2018b), and Abeler et al. (2019).

⁵See, e.g., Weibull and Villa (2005), Ellingsen and Johannesson (2008), Alger and Weibull (2013), Figuères et al. (2013), Le Maux et al., (2019), Abeler et al. (2019).

⁶Our empirical findings do not show any significant association between dishonesty and risk-aversion. Hence, risk-neutrality does not seem a restrictive assumption.

3.2. Effects of monetary incentives

Since y_H is not apparent in equation 2, action $a_{i,t}^*$ is insensitive to that parameter. A variation in y_H , however, affects $P_{i,t}$.⁷ We thus have the following two testable hypotheses:

Proposition 2. Payoffs from honesty y_H

- a. Higher levels of y_H lower the probability $P_{i,t}$ to be dishonest.
- b. The offense level $a_{i,t}^*$ conditional on being dishonest is insensitive to variations in y_H .

The effect of a change in the unit value of offense y_H' is more complex as it not only impacts the net monetary benefit but also the moral costs. In the case of an interior solution:⁸

$$\frac{\partial a_{i,t}^*}{\partial y_D'} \geq 0 \quad \text{if} \quad W_{12} \leq U', \quad (4)$$

where W_{12} is the cross-partial derivative of W with respect to its first and second argument. Moreover, we have:⁹

$$\frac{\partial P_{i,t}}{\partial y_D'} \geq 0 \quad \text{if} \quad \frac{W_2}{a_{i,t}^*} \leq U', \quad (5)$$

where $W_2/a_{i,t}^*$ stands for the average marginal moral cost incurred by agent i when incentives to fraud increase. From equations 4 and 5, we get:

Proposition 3. Euro value of one unit of offense y_D'

- a. If moral costs are convex and strongly interact with incentives (W_{12} and $W_2/a_{i,t}^* > U'$), then the higher y_D' , the lower are the probability $P_{i,t}$ and size $a_{i,t}^*$ of offense.
- b. If moral costs are concave, only the probability $P_{i,t}$ of being dishonest is affected by a change in y_D' .

Figure 1 displays the different cases. In panel (a) there is no interaction between moral costs and incentives. An increase in y_D' affects only the net monetary benefit curve: both intensive and extensive margins are positively affected (a^* shifts to the right while the distance between the two curves is increasing). Panel (b) depicts a situation where the moral costs

⁷From equation 3, $\frac{\partial P_{i,t}}{\partial y_H} = -F'U' < 0$.

⁸Applying the implicit function theorem to equation 2: $\frac{\partial a_{i,t}^*}{\partial y_D'} = -\frac{y_D' a_{i,t}^* EU_i'' + EU_i' - W_{12}}{y_D'^2 EU_i'' - W_1} = -\frac{U' - W_{12}}{-W_1}$.

⁹Assuming an interior solution, from equation 3, $\frac{\partial P_{i,t}}{\partial y_D'} = F'(EU_i' y_D' - W_1) \times \frac{\partial a_{i,t}^*}{\partial y_D'} + F'(EU_i' a_{i,t}^* - W_2) = F'(U_i' a_{i,t}^* - W_2)$. Assuming a corner solution: $\frac{\partial P_{i,t}}{\partial y_D'} = F'(U_i' \bar{a} - W_2)$.

interact slightly with incentives in contrast with panel (c) where both intensive and extensive margins are decreasing. Last, panel (d) illustrates the corner solution, when moral costs are concave. Here, the optimal offense is insensitive to payoffs, yet incentives interact with moral costs to shape the final decision to be dishonest.

3.3. Effects of information about others' behavior

Beliefs $\hat{\beta}_{i,t}$ about others being dishonest positively affect the probability $P_{i,t}$ of being dishonest.¹⁰ Now, as suggested by the literature, let us assume that beliefs are positively (and linearly) associated with the true fraction $\beta_{i,t-1}$ of others being dishonest in $t-1$ and past beliefs $\hat{\beta}_{i,t-1}$:

$$\hat{\beta}_{i,t} = \beta_{i,t-1} + \alpha(\hat{\beta}_{i,t-1} - \beta_{i,t-1}). \quad (6)$$

Agent i may have imperfect knowledge of the true fraction: the term between brackets stands for this misjudgment in $t-1$. Parameter $\alpha \in [0, 1]$ measures the extent to which that misjudgment reproduces itself in t . The lower α , the more responsive are the beliefs to the true fraction $\beta_{i,t-1}$.¹¹

We have $\partial \hat{\beta}_{i,t} / \partial \alpha > 0$ if and only if $\hat{\beta}_{i,t-1} > \beta_{i,t-1}$. Assuming that bias α is reduced when information is more readily available, we obtain:

Proposition 4. Belief bias α

A decrease in α , e.g., because of additional information about others' behavior, will yield a decrease (resp. increase) in the probability $P_{i,t}$ of being dishonest if and only if agent i is overestimating (resp. underestimating) the true fraction of dishonest agents in $t-1$.

Note that if agents' beliefs $\hat{\beta}_{i,t}$ are affected by the true fraction, then a change in monetary incentives y_H or y_D' that occurs at $t-1$ and t will affect the probability of being dishonest through two different channels:

$$\frac{\partial P_{i,t}}{\partial (\cdot)} = \underbrace{\frac{\partial P_{i,t}}{\partial (\cdot)}}_{\text{Incentives}} + \underbrace{\frac{\partial P_{i,t}}{\partial \hat{\beta}_{i,t}} \times \frac{\partial \hat{\beta}_{i,t}}{\partial \beta_{i,t-1}} \times \frac{\partial \beta_{i,t-1}}{\partial (\cdot)}}_{\text{Interaction with information}}, \quad (7)$$

¹⁰From equation 3, $\frac{\partial P_{i,t}}{\partial \hat{\beta}_i} = -F'V_1 > 0$.

¹¹If $\alpha = 1$, agent i does not update their beliefs according to the true fraction: $\hat{\beta}_{i,t} = \hat{\beta}_{i,t-1}$. If $\alpha = 0$, beliefs are unbiased and are fully responsive to the true fraction: $\hat{\beta}_{i,t} = \beta_{i,t-1}$. If $\alpha \in (0, 1)$, then the updating process takes time.

First, a change in monetary incentives has a direct effect on the probability of being dishonest: $\partial P_{i,t}/\partial(\cdot)$. Second, since others' dishonesty is also affected in $t - 1$, incentives interact with information to shape the final decision to be dishonest. The effect consists of the initial change in others' behavior, $\partial \beta_{i,t-1}/\partial(\cdot)$, followed by a change in agent i 's beliefs in the next period, $\partial \hat{\beta}_{i,t}/\partial \beta_{i,t-1} = 1 - \alpha$, which affects in return his/her probability of being dishonest, $\partial P_{i,t}/\partial \hat{\beta}_{i,t}$. Assuming that the agents react in a similar manner to monetary incentives (i.e. $\partial P_{i,t}/\partial(\cdot)$ and $\partial \beta_{i,t-1}/\partial(\cdot)$ have the same sign), we conclude that the lower the bias α , the larger is the effect of incentives:

Proposition 5. *Interaction between incentives and information*

- a. If agents have unbiased beliefs (α close to 0), information about others' behavior intensifies the impact of economic incentives.*
- b. If agents have biased beliefs (α close to 1), information about others' behavior does not intensify the impact of economic incentives.*

To conclude, the model shows that the evolution of unethical behavior over time and across agents can be quite complex, even accepting the hypothesis that monetary incentives determine the final outcome. External rewards may not only affect the number of offenses committed (extensive margin, $P_{i,t}$) but also their nature (intensive margin, $a_{i,t}^*$) in both present and future periods. In particular, the presence of endogenous moral costs may yield counter-intuitive effects, hence the need for further empirical investigation.

4. Experimental design

4.1. *The game and treatments*

The game that subjects played for 20 rounds is a modified version of the “observed game” developed by Kajackaite and Gneezy (2017). At each period, subjects click in private on one of six boxes labeled “a, b, c, d, e, f” on the computer and reveal a number between one and six. In each period, the numbers are randomly assigned to the boxes (see Appendix A). In line with previous literature (e.g., Shalvi et al., 2011; Fischbacher and Föllmi-Heusi, 2013), subjects are allowed to click on several boxes to check the consistency of the payoff scheme. However, they are asked to report the number that they first saw on the next screen. We introduce the possibility to cheat by mentioning in the instructions that mistakes are never sanctioned.

The advantage of this design is that it allows us to measure dishonesty at the individual level, unlike the die-under-cup task. In a sense our game is close to taxation games with the

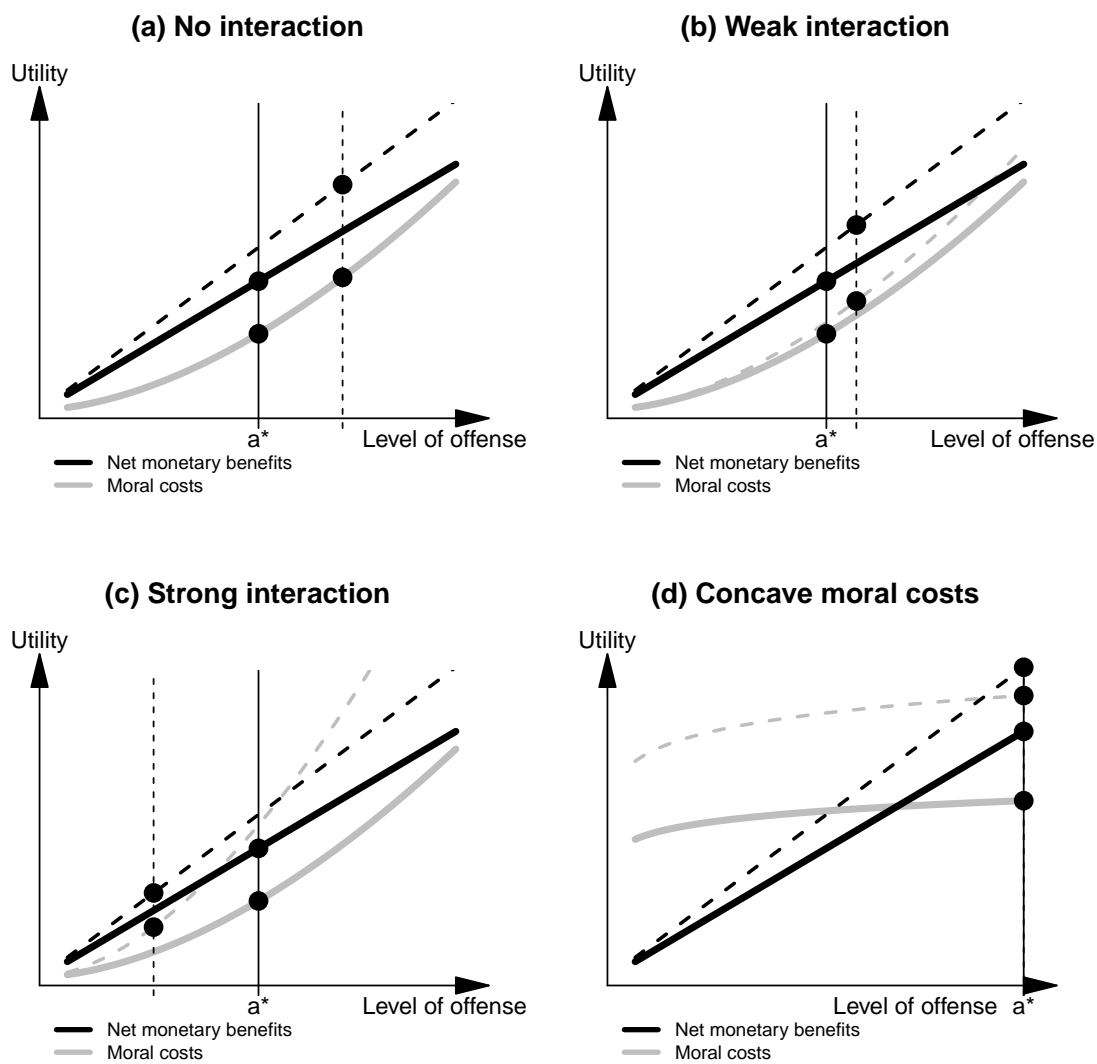


Figure 1: Impact of an increase in the euro value of a unit of offense (dotted curves).

Table 1: Treatments

	Low	High	Very High	N
No information	No info Low (N=70)	No info High (N=95)	No info Very High (N=95)	260
Information	Info Low (N=90)	Info High (N=120)	Info Very High (N=90)	300
N	160	215	185	560

notable exception that the audit rate and penalties are set to zero. We are thus able to study the extensive and intensive margin of dishonesty. In order to reduce participants' feeling of being observed, the payoff each participant receives is randomly selected from their decision in one of the 20 periods. The payoffs are independent of others' behavior (no strategic reasoning).

We use a 2×3 (between subjects) design (see Table 1). The first dimension varies the information about others' behavior. In the treatments without information subjects play 20 rounds of the game without observing each other. The treatments with information are the same as the treatments without, except that at the end of each period subjects are informed about the behavior of their four other group members in that round. In both, the treatments with and without information, we elicited participants' beliefs about others' over-reporting, after reporting their number. In the treatments with info, the belief was requested before receiving information about others' behavior.¹² Rauhut (2013) finds that beliefs are important to explain the reaction to information about others' behavior. Comparing treatments with information to those without information allows us to disentangle observing others' behavior from other mechanisms that may affect cheating over time.

The second dimension of our experiment varies the payment scheme, i.e., the payoff per reported number (see Table 2). In the treatments with low premium (titled Low), participants can earn between 10 ct and 60 ct in the "observed game." In the treatments with high premium (titled High), payoffs are multiplied by 10 such that participants can earn between 1 Euro and 6 Euro. Finally, in the treatments with very high-premium (Very High), payoffs are multiplied by 40 compared to the low payoff condition such that participants can earn between 4 Euro and 24 Euro in the "observed game." Comparing these treatments allows us to investigate the effect of incentives on the extensive and intensive margin of dishonesty and if the effect of information about others varies with payoffs.

¹²This occurs after they reported their number and before they receive information about others' behavior in the treatments with info.

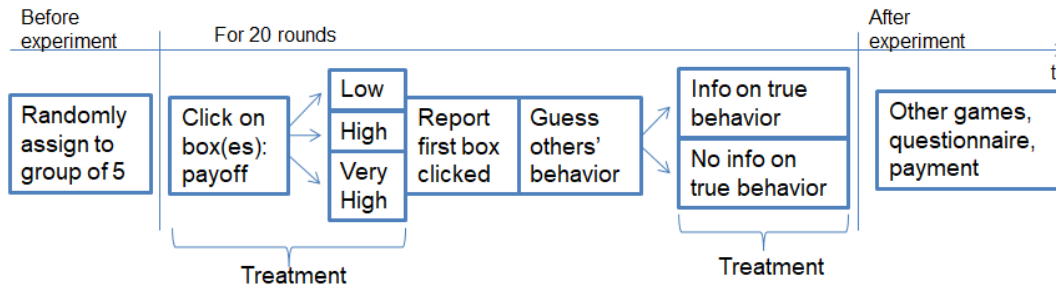
Table 2: Monetary incentives (in Euros)

Reported figure	1	2	3	4	5	6
Low	0.10	0.20	0.30	0.40	0.50	0.60
High	1	2	3	4	5	6
Very high	4	8	12	16	20	24

4.2. Procedures

Our laboratory experiment took place at the LABoratory of EXperiment in Economics and Management LABEX-EM (CREM-University of Rennes 1, France) in 09/2017, 03-05/2018, and 09/2018. Recruitment took place using Orsee. We used Ztree to program the experiment. Participants signed a consent form. Our sample consists of 560 students. Appendix A.2 contains summary statistics which show that the sample is balanced across treatments.

Before the experimental phase started, each subject was randomly allocated to a mini-society of five members. The five members of a group interacted with each other for 20 periods (partner matching). Instructions were given in paper and read aloud. After these preparations, the main experiment started. Participants played 20 rounds of the game, as described above. At the end of the experiment, risk aversion was elicited (Holt and Laury, 2002). To control for possible cognitive biases, participants were also asked to play a memory game which was meant to measure difficulties in memorizing numbers across screens. A post-experimental questionnaire inquired socio-demographic characteristics, attitudes, and the perception of the experiment. Figure 2 gives an overview of the procedure.

Figure 2: Experimental design

5. Results

We compare the assigned number (first box clicked on) with the reported number to obtain measures of dishonesty.

5.1. Extensive margin: the determinants of the fraction of cheaters

In this section, we focus our attention on the fraction of cheaters, i.e., on the extensive margin. We create a binary variable which indicates if a subject was dishonest; it is equal to one if he or she reports a number higher than the one that he or she first clicked on (“fraction of liars”). The 67 observations in which subjects report a number lower than the one that they first clicked on are not counted as dishonesty (downward lying).¹³

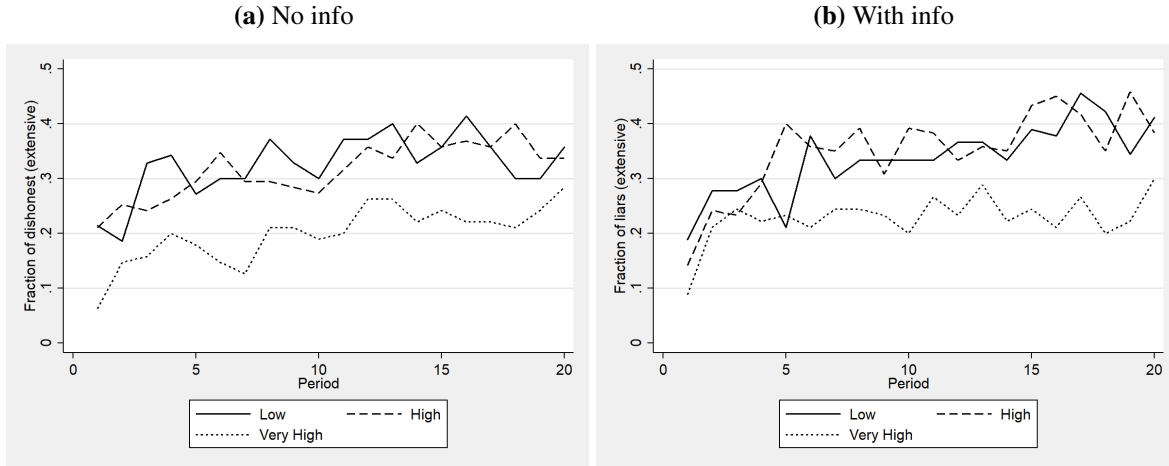
In the treatments without information, the average fraction of cheaters is 32.5% in the Low condition and 31.6% in the High condition (Δ to Low: 0.008, p-value Mann-Whitney test: 0.597). In contrast, in treatment Very High the fraction of cheaters drops to 20% (Δ to Low: 0.125, p-value: 0.000).

Figure 3 (a) shows the fraction of cheaters over time per payoff without information. After a sharp increase of cheaters in the second period, which may reflect a learning effect, the level of cheaters continues to increase slightly. The fraction of cheaters is significantly larger in the last five periods than in the first five periods in all three payoff conditions (Low $\Delta=0.08$, p-value: 0.027; High $\Delta=0.11$, p-value: 0.000; Very High $\Delta=0.08$, p-value: 0.000). The difference between Low and Very High is stable across periods suggesting that no convergence takes place (Period 1-5: $\Delta=0.119$, p-value: 0.000; Period 16-20: $\Delta=0.109$, p-value: 0.000).

A similar pattern is observed in the treatments with information about others’ behavior, as shown in Figure 3 (b). The average fraction of dishonest is 33.6% in treatment Low, 35.1% in treatment High (Δ to Low: 0.015, p-value=0.325), and 22.9% in treatment Very High (Δ to Low: 0.107, p-value= 0.000). Dishonesty increases from period 1-5 to period 16-20 in Low and High ($\Delta=0.15$, p-value=0.000) but not in Very High ($\Delta=0.04$, p-value=0.148). As a consequence, in the info condition we observe divergence between Low (and similarly High) and Very High across time. While there is no significant difference in periods 1-5 (Δ 0.051, p-value=0.067) the difference is larger and statistically significant in periods 16-20 (Δ 0.162, p-value=0.000).

Table 3 reports the fraction of dishonest subjects across the 20 periods for each true state

¹³In contrast, Abeler et al. (2019) do not find evidence of downward lying when dishonesty is observable.

Figure 3: Extensive margin by payoff and period

Note: No Info Treatment based on 5,200 observations, Info Treatment based on 6,000 observations.

by the six treatments. Across all conditions, we find a negative relationship between the true number and being a liar. Subjects whose first opened box displayed a one are most likely to be dishonest. Subjects whose first box showed a five are least likely to be dishonest. The relative decrease of the fraction of cheaters from true state 1 to true state 5 slightly increases with the payoff with and without information. The correlation between true state and the probability of lying is -0.33 (Spearman's rho) in all payoff levels in the treatments without information. In the treatments with information it is -0.38 in Low, -0.41 in High, and -0.34 in Very High (Test of H_0 that dishonesty and true state are independent in all treatments: $p=0.000$). The results are in line with Gneezy et al. (2013) and Andersen et al. (2018). However, we are also able to show that the behavior with regard to true state varies little with the payoff level.¹⁴

¹⁴We run a random effects probit regression in which the decision to lie is the dependent variable, controlling for payoff, first box, the interaction thereof, and a set of control variables (similar to the results reported in Table 5). The interaction terms suggest that the effect of true state is largely the same across payoff levels.

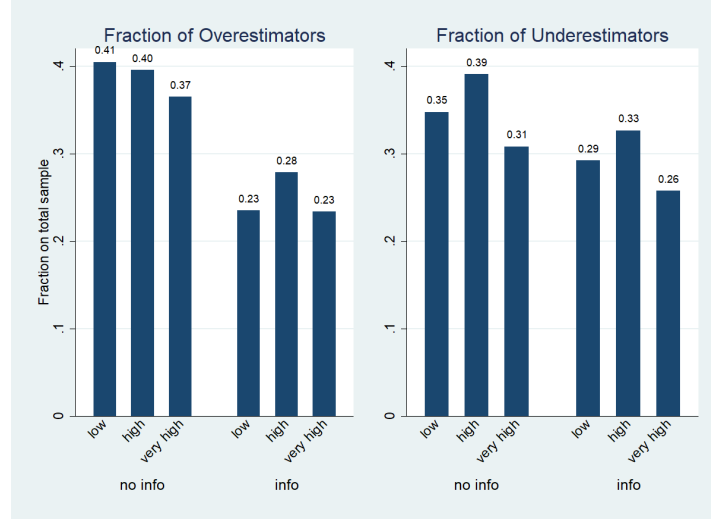
Table 3: Extensive and intensive margin: Dishonesty by true state and treatments

	N	Number first seen					Δ 1 vs. 5		Spearman's
		1	2	3	4	5	Abs.	Rel.	rho
Panel A. Extensive margin: No info									
Low	1400	0.50	0.44	0.42	0.37	0.25	0.25	0.50	-0.33
High	1900	0.50	0.41	0.41	0.31	0.20	0.30	0.60	-0.33
Very High	1900	0.36	0.35	0.27	0.18	0.08	0.28	0.78	-0.33
Panel B. Extensive margin: With info									
Low	1800	0.52	0.54	0.44	0.36	0.20	0.32	0.62	-0.38
High	2400	0.58	0.55	0.46	0.32	0.19	0.39	0.68	-0.41
Very High	1800	0.38	0.40	0.28	0.21	0.10	0.28	0.74	-0.34
Panel C. Intensive margin: No info									
Low	455	0.89	0.92	0.95	0.95	1	-0.11	-0.12	0.14
High	601	0.85	0.80	0.89	0.92	1	-0.15	-0.18	0.14
Very High	380	0.71	0.66	0.83	0.93	1	-0.29	-0.40	0.23
Panel D. Intensive margin: With info									
Low	606	0.84	0.83	0.87	0.89	1	-0.16	-0.19	0.12
High	843	0.84	0.81	0.89	0.94	1	-0.16	-0.19	0.15
Very High	413	0.76	0.68	0.81	0.91	1	-0.24	-0.31	0.16

Next, we study the effect of information about others' behavior by payoff. As indicated in Figure 3, dishonesty is slightly higher in the treatments with information (Figure 3b) than in treatments without information (Figure 3a) in all payoff conditions. On average, the fraction of liars is 34% with and 32% without info in Low ($p=0.487$). In High, the fraction without info is 32% and 35% with info, the difference is significant at the 5% level ($p=0.016$). In Very High, 20% cheat in the no info condition and 23% in the info condition ($p=0.029$).

Following Rauhut (2013), we study the effect of information taking into account that individuals differ in the accuracy of their beliefs on what others are doing. Underestimators are defined as those that estimated the fraction of dishonest to be lower than it actual was in the previous period. Overestimators are defined as those that estimated the fraction to be higher. First, we study if the fraction of these types are the same across payoff levels. As shown in Figure 4 the fraction of over- and underestimators ranges between 31 and 41% of the sample when no information is provided. The fraction is only between 23 and 33% when information is provided. Hence, information allows a higher fraction to correctly estimate what others are doing. The fractions slightly vary with the payoffs, e.g., we find a significant difference in the share of overestimators Low vs. Very High No Info or High vs. of Underestimators Low/Very High No Info. We conclude that information and payoffs influence the accuracy of beliefs.

Figure 5 shows the behavior of over- and underestimators by information condition,

Figure 4: Fraction of over-/underestimators by payoff and info

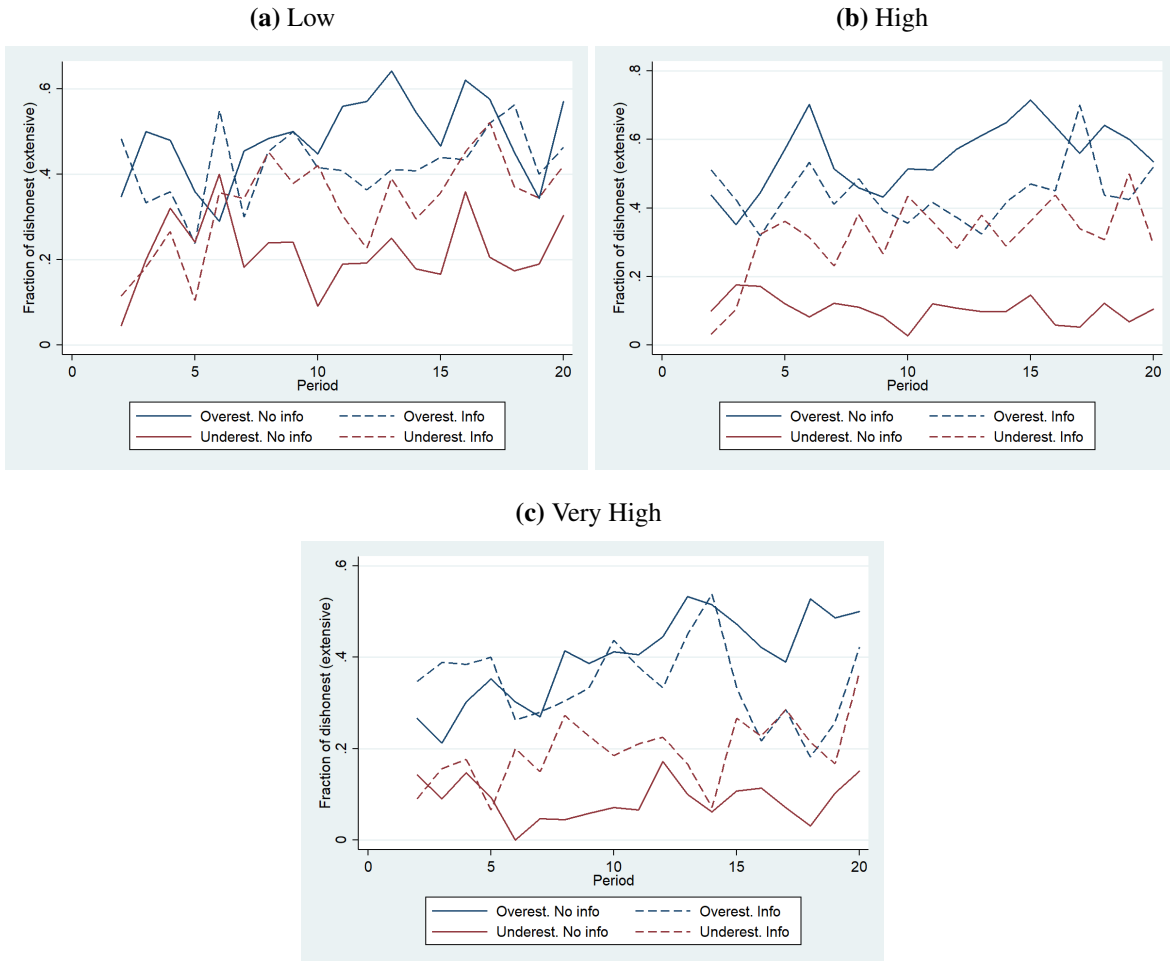
conditional on the payoff. Across all payoffs, we find that those who overestimated the fraction of cheaters in the previous period are less likely to be dishonest when information is provided (Low $\Delta = -0.05$, High $\Delta = -0.12$, Very High $\Delta = -0.06$). The opposite effect is observed among those who underestimated the fraction of dishonest in the previous period; their reaction is quantitatively stronger than the reaction of overestimators (Low $\Delta = 0.11$, High $\Delta = 0.20$, Very High $\Delta = 0.10$). This explains that on average we find a weakly positive effect of information on the fraction of cheaters.¹⁵ The large difference in dishonesty across over- and underestimators present without info substantially narrows when information is given. The results are similar across payoff condition. However, over- and underestimators most strongly react to information about others' behavior in the High condition.

Result 1 (extensive margin). a) The fraction of dishonest is significantly lower in the Very High payoff treatment compared to the Low payoff treatment. b) Information about others has a weak effect on the average fraction of dishonest and a strong effect if it is distinguished by over- and underestimators. c) There is no interaction between the effects of payoffs and information. d) Lying increases over time in all treatments.

5.2. Intensive margin: The determinants of the intensity of the lie

Next, we study the size of the lie of those that are dishonest. For those that were dishonest, we calculate a binary variable which indicates if the subject lied to the maximum extent (intensive

¹⁵ Another explanation is that subjects that correctly estimated the fraction of cheaters (N=3,887) also increase dishonesty. While on average 19.5% of them are dishonest without info, 29% are dishonest with info (p=0.000).

Figure 5: Over- and underestimation by payoff and period

Note: Low based on 3,200 obs, High based on 4,300 obs, Very High based on 3,700 obs.

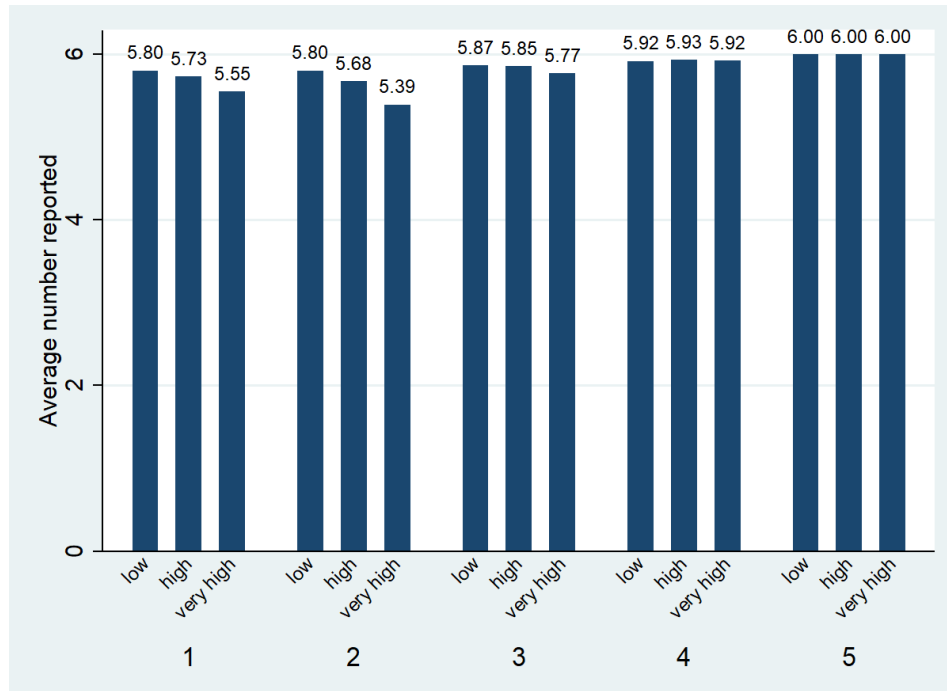
margin).

As reported in Table 4, we find that a large majority cheats to the maximum possible extent and reports six when the true state was less than six. We find that the fraction that cheats to the maximum extent decreases with the payoff. In the treatments without information, in Low almost anyone that cheats does so to the maximum extent, while the fraction of maximum cheaters decreases to about three fourth in treatment Very High. The difference to Low is significant for treatments High ($p=0.001$) and Very High ($p=0.000$). In the treatments with information, the difference to Low is significant for treatment Very High ($p=0.000$). The fraction of maximum liars does not differ across no info and info, except for Low ($p=0.000$). The fraction that cheats maximally increases slightly but insignificantly across time.

Table 4: Cheating to the maximum extent by payoff and info

	N	No info			N	With info		
		All	First 5R	Last 5R		All	First 5R	Last 5R
Total	1436	0.866	0.852	0.873	1862	0.852	0.822	0.882
Low	455	0.934	0.914	0.95	606	0.87	0.858	0.883
High	601	0.874	0.841	0.906	843	0.871	0.841	0.914
Very High	380	0.774	0.788	0.741	413	0.787	0.744	0.806

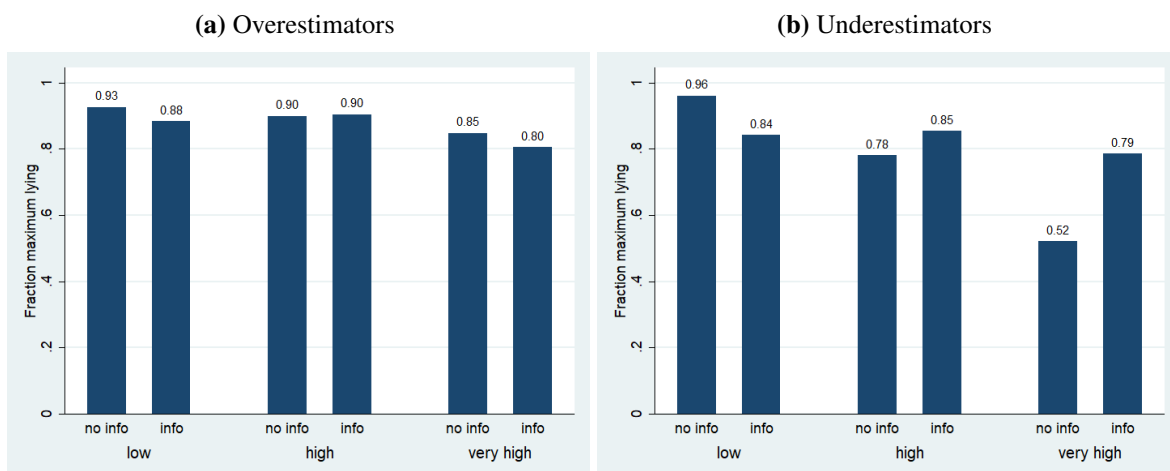
Figure 6 displays the average reported number (conditional on being dishonest), as a function of the true state and payoff. Since the differences between the no info and info condition are marginal, we report the joint distribution. The average reported number is 5.9 in Low, 5.8 in High (Δ to Low $p=0.001$), and 5.6 in Very High (Δ to Low $p=0.000$). Participants report high numbers for each true state, the average varies between 5.39 and 6. The average number of those with true state 1 is significantly lower than the one of those with true state 5 in all payoff conditions ($p=0.000$). The higher the payoff and the lower the true state, the less likely it is that subjects lie to the maximum extent. The reported number for those that first saw 1, 2, or 3 is significantly lower among those in Very High compared to those in Low. Comparing High and Low, there is only a difference for true state 2.

Figure 6: Number reported by true state and payoff

Note: No Info Treatment based on x observations, Info Treatment based on x observations.

Next we study the effect of over- and underestimation on the likelihood of lying to the maximum extent. As shown in Figure 7, in High and, in particular, in Very High, underestimators are more likely to lie to the maximum extent when they are given information, which is in line with the result from the extensive margin. However, in Low the fraction of underestimators that lies to the maximum extent decreases when they are given information about others' behavior. A possible explanation is that since underestimators without info almost all cheat to the maximum extent, a further increase is not possible. Figure 7 shows that overestimators are slightly less likely to lie to the maximum extent when given information about others' behavior but the difference is not significant in any condition.

Figure 7: Maximum lie over-/underestimators by payoff and info



Note: Overestimators based on 3,360 observations, underestimators based on 3,393 observations.

To provide formal statistical evidence for our findings we conduct a regression analysis. Since each subject is observed 20 times, we use panel data methods. We report the results of random effect probit models in which the dependent variable is the binary decision to lie. Standard errors are clustered at the group level to control for interdependence within groups.

The results are reported in Table 5. In column (1), we only control for the two dimensions of the treatments and the period. The results confirm the findings that the fraction of cheaters (extensive margin) is significantly lower when the payoff is Very High and that information has only a weakly positive effect. The period variable has a positive and significant coefficient, reflecting that the fraction of liars increases over time.

In column (2), we add controls for the true state and demographics. As described above, people are more likely to cheat when first number observed is lower. We find a significant effect of gender, religion and self-reported attitude with regard to unethical behavior. Females,

Table 5: Estimation Results: Extensive margin

	(1) b/se	(2) b/se	(3) b/se
Info	0.062* (0.033)	0.066 (0.050)	0.064 (0.048)
Payoff: Low	Ref.	Ref.	Ref.
Payoff: High	0.020 (0.048)	-0.009 (0.084)	-0.012 (0.078)
Payoff: Very high	-0.105** (0.042)	-0.180** (0.077)	-0.178** (0.070)
Period	0.007*** (0.001)	0.010*** (0.001)	0.006*** (0.001)
First box: 1		Ref.	Ref.
First box: 2		-0.021 (0.017)	-0.029 (0.018)
First box: 3		-0.144*** (0.027)	-0.154*** (0.026)
First box: 4		-0.273*** (0.046)	-0.305*** (0.043)
First box: 5		-0.360*** (0.070)	-0.404*** (0.065)
First box: 6		-0.376*** (0.077)	-0.419*** (0.070)
age		-0.003 (0.003)	-0.003 (0.003)
female		-0.077 (0.049)	-0.074 (0.050)
economics		-0.002 (0.048)	0.007 (0.049)
Risk aversion		0.012 (0.014)	0.011 (0.014)
Cheat attitude		0.052** (0.020)	0.054*** (0.020)
religious		-0.025*** (0.008)	-0.025*** (0.007)
political		-0.014 (0.013)	-0.015 (0.013)
finance1		0.029 (0.045)	0.031 (0.047)
point		0.036** (0.017)	0.034** (0.017)
Believes 0/4 dishonest			Ref.
Believes 1/4 dishonest			0.053*** (0.014)
Believes 2/4 dishonest			0.079*** (0.021)
Believes 3/4 dishonest			0.088*** (0.025)
Believes 4/4 dishonest			0.135*** (0.042)
Actual 0/4 dishonest			Ref.
Actual 1/4 dishonest			0.015 (0.012)
Actual 2/4 dishonest			0.017 (0.013)
Actual 3/4 dishonest			0.031* (0.017)
Actual 4/4 dishonest			0.042 (0.030)
N	11200	11200	10640

Notes: Random effect probit models. Reported are marginal effects. Standard errors clustered at the group level reported in parenthesis. Significance levels indicated as * $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$.

religious people and those that find cheating less justifiable tend to cheat less. Importantly, the variable risk aversion is not significant. The variable points corresponds to the number of correct answers in our memory game. This game was implemented in order to isolate lying from mistakes due to lack of memory. Our main findings remain unchanged after controlling for this variable that has a significant and positive effect. The finding refutes the assumption that deviations from the correct number can be attributed to mistakes due to lack of memory.

To study the result if payoff and info interact, we add interaction terms to the regression reported in column (2) (coefficients not reported). The marginal effects from that regression are reported in Table 6, Panel A. In line with the descriptive results, dishonesty is lower in the Very High treatments in the treatments with and without information. There is no difference.

Column (3) displays an estimate that also controls for the belief how many others' cheated (Believes $x/4$ dishonest) and the actual number of dishonest people observed in the previous period (Actual $x/4$ dishonest). A higher expected fraction of others being dishonest is strongly positively correlated to the probability of lying. In contrast, the actual behavior of others in the previous period has on average no effect. Since subjects were only aware of others' behavior in the information treatments, we study if the effect of others' behavior differs across treatments with and without information. We estimate the regression reported in column (3) including interactions of the belief and actual behavior variables and info. The marginal effects calculated from the regression are reported in Table 6, Panel B. They show that in the treatment with information a higher number of observed liars in the group implies a higher likelihood of cheating. This is highly plausible since participants are by definition not informed about the decisions of others. Interestingly, the marginal effects on the belief variable with and without info show that information reduces the importance of the belief.

Table 6: Marginal effects from regressions including interaction terms

Variable	Conditional on	ME	SE
Panel A. Marginal effects from column (2) incl. payoff*info			
Payoff Low	No info	Ref.	Ref.
	With info	Ref.	Ref.
Payoff High	No info	-0.057	0.098
	With info	0.035	0.07
Payoff Very High	No info	-0.157*	0.091
	With info	-0.139**	0.065
Panel B. Marginal effects from column (3) incl. believes*info, actual*info			
Actual 0/4 dishonest	No info	Ref.	Ref.
	With info	Ref.	Ref.
Actual 1/4 dishonest	No info	-0.004	0.011
	With info	0.023*	0.013
Actual 2/4 dishonest	No info	0.003	0.011
	With info	0.021	0.013
Actual 3/4 dishonest	No info	0.007	0.025
	With info	0.034**	0.015
Actual 4/4 dishonest	No info	-0.016	0.023
	With info	0.059**	0.029
Believes 0/4 dishonest	No info	Ref.	Ref.
	With info	Ref.	Ref.
Believes 1/4 dishonest	No info	0.077***	0.02
	With info	0.025**	0.012
Believes 2/4 dishonest	No info	0.093***	0.025
	With info	0.045***	0.017
Believes 3/4 dishonest	No info	0.12***	0.03
	With info	0.032	0.022
Believes 4/4 dishonest	No info	0.143***	0.039
	With info	0.077	0.051

6. Summary and discussion

The question about how both monetary incentives and others' behavior affect people's tendency to cheat has long puzzled economists. We contribute to the existing literature by studying the effect of payoffs and information about others' behavior in a laboratory experiment. In contrast to previous literature, we are able to distinguish the extensive and intensive margin.

We show that payoffs do not only influence the extensive margin of dishonesty but also the intensive margin. Individuals are less likely to lie to the maximum extent when payoffs increase. Our results are consistent with previous non-strategic cheating games showing that increasing monetary incentives does not increase dishonesty (e.g., Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013; Andersen et al., 2018) or even decreases it (Balasubramanian et al., 2017).

In line with previous studies (Diekmann et al., 2015; Kroher and Wolbring, 2015; Rauhut, 2013), we find that on average information about others' behavior has at most a weak effect. Information also has no impact on the share cheating to the maximum extent. We confirm Rauhut (2013) that it is important to take into account peoples' belief when studying the effect of information. Our results weakly suggest that information has an impact on the over- and underestimators' intensity of the lie, however, the effects are not significant. We find that the effect of information is largely the same across payoff levels.

We find that dishonesty increases over time, even in absence of information about others. One may argue that it could be due to a pure learning effect. However our game was simple, which makes this conjecture rather unrealistic. Furthermore self-reported answers to the question "how did you perceive the game" tend to indicate that subject well understood the game. Another possible reason behind this finding is that participants may have had the feeling of being observed and that this effect decreased over time. Note however that our risk aversion measure was never significant. Last, one may reasonably argue that disutility of cheating may decrease with previous experience.

A possible objection to our study is that our game is simple and does not fit with real life, thus lacking of external validity. In line with an expanding body of literature (see the recent review by Abeler et al., 2019) our cheating game was designed without any penalty and monitoring. In most of situations of real life, there is a positive probability of detection and penalties associated with dishonesty. Our purpose is to test how cheating is influenced by payoffs and information in absence of any material cost for doing so. This simplification allows us to focus our attention on the non monetary costs of cheating. Potters and Stoop

(2016) and Dai et al. (2017) show that simple games like ours predict behavior in the field.

Another concern is that the possibility to observe dishonesty influences behavior. The participants cannot conceal dishonesty from the experimenter; this may evoke higher honesty. This approach is common in tax evasion games (see e.g., Malezieux, 2018). Abeler et al. (2019) find that observability of the true state decreases the likelihood that very high states are reported. The results by Gneezy et al. (2018a) suggest that more participants lie partially when their outcomes cannot be observed by the experimenter than when the experimenter can later verify the actual outcome. This suggests that the effect on the size of the lie might be even stronger when cheating is observable. However, although the fraction of maximum cheaters may be different in other settings, our main interest is in how behavior varies across treatments. We argue that the possibility to observe dishonest behavior does not influence the observed treatment effects.

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A.1. Experimental instruction

General information. Welcome. This experience will last about an hour and a quarter. We ask you not to communicate with other participants for the duration of this experiment. We also ask you not to write on the instructions. For your participation, you will receive a payoff of 2.50 Euros, whatever the decisions made during the experiment. In addition, you can increase your earnings. The experience is divided into several parts for which you will receive separate instructions. Your earnings will be calculated at the end of the experience. You will receive by check all the gains obtained during the different parts, in addition to 2.50 Euros.

Treatment-specific information (high payoff, (with) information). Please read these instructions carefully. You can earn a certain amount of money depending on your decisions. You will be randomly assigned to a group of five participants for a series of twenty periods. The group remains unchanged during the twenty periods. In each period, on the screen you will see six boxes marked a, b, c, d, e, f with numbers hidden behind (1, 2, 3, 4, 5, and 6). These numbers are placed in a random order that will change each time. In each period, you will have to click on a box. Once clicked, you will see a number appear in bold. For example, in the screen below, you clicked on box "c" and the hidden number is 4. You can click on the

Période 1/20

S'il vous plaît, cliquez sur une des boîtes :

a	b	c	d	e	f
		4			

Retenez le chiffre que vous avez vu. Vous pouvez cliquer sur les autres boîtes mais seule la première boîte compte.

OK

other boxes but only the first box on which you clicked matters. You will be asked to report the number you saw at the first click, as described in the screen below:

The reported figure is necessarily between 1 and 6. Your gain will be determined by the number you entered according to the following table:

Période 1/20

S'il vous plaît indiquez le chiffre que vous avez vu au premier clic :

OK

Reported figure	1	2	3	4	5	6
Payoff	1 euro	2 euros	3 euros	4 euros	5 euros	6 euros

For example, if you wrote "1", you will receive 1 euro. If you wrote "2", you will receive 2 euros; if you wrote "3", you will receive 3 euros, and so on. The higher the reported figure, the higher your payoff.

In each period, six new boxes will appear on the screen. You will need to click on one of them and, again, fill in the input boxes. This part of the experiment ends after twenty periods. At the end of the experiment a period will be drawn randomly to determine your payoff and you will be paid according to the figure you have entered at this time.

In each period, we will also ask you to guess the percentage of those in your group who have correctly reported their first click (you excluded). For example, in the screen below, you are asked to choose between 0%, 25%, 50%, 75% or 100%.

Période 1/20

D'après vous, dans cette période, quel est le pourcentage des chiffres correctement reportés par les autres membres de votre groupe ?

☐ 0%
 ☐ 25%
 ☐ 50%
 ☐ 75%
 ☐ 100%

OK

[*Treatment with information:* A screen will appear next and give you the correct answer]. One of the percentages you have entered will be randomly selected at the end of the experiment, and you will receive 50 euro cents if you guessed right.

Important: your decisions are anonymous and private. The computer program does not allow us to make the link between your identity and your answers. Errors will not be sanctioned and the experience will continue even in case of mistakes. You will be paid according to what you report. If you have any questions, please raise your hand and we will come to see you!

Memory game. [*On paper*]. You will now participate in a memory game. Be careful: numbers will appear on the screen. You will have to retain them and then report them as a whole. The sequence of numbers to remember will be longer and longer. It is forbidden to use the pencil or the calculator. The participant of this session having obtained the highest score in this memory game will receive two additional euros. A draw will be made in case of a tie.

A.2. Additional results

Table A.1: Description and statistics of control variables

Variable	Description	Total	Treatment					
			1	2	3	4	5	6
Age	Age of subject	21.50	22.67	22.57	22.96	20.18	19.97	21.34
Female	Is subject female (Y/N)	0.51	0.53	0.56	0.52	0.48	0.60	0.38
Economics	Is economics student (Y/N)	0.43	0.16	0.30	0.52	0.71	0.34	0.41
Risk aversion	Number of safe choices in Holt/Laury 2002 risk aversion game, higher=more risk averse	6.22	5.96	6.12	6.14	6.18	6.42	6.42
Cheating attitude	Average assessment of justifiability of 11 practices on scale 1-10 (taken from World Value Survey), higher=less morale	3.23	3.07	3.31	3.38	3.32	3.15	3.07
Religious	Importance of god in life, 1=no importance, 10=high importance	3.52	3.74	3.66	3.41	3.60	3.37	3.38
Political orientation	1 leaning to left, 10 leaning to right	4.61	4.59	4.26	4.36	5.08	4.75	4.48
Finance	Financial knowledge, 1=none, 2=some, 3=high	2.33	2.29	2.36	2.20	2.45	2.29	2.34
Memory game	Points achieved in memory game, higher=better at memorizing	6.23	5.99	6.20	6.11	6.36	6.28	6.38