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Does the extent of cheating depend on a proper reference point? We use a real-effort matrix task that implements a two (gain versus loss frame) times two (monitored performance versus unmonitored performance) between-subjects design with 600 experimental participants to examine whether the extent of cheating is reference dependent. Self-reported performance in the unmonitored condition is significantly higher than actual performance in the monitored condition—a clear indication of cheating. However, the level of cheating is by far higher in the loss frame than in the gain frame under no monitoring. The fear of a loss seems to lead to more dishonest behavior than the lure of a gain.

Data, as supplemental material, are available at https://doi.org/10.1287/mnsc.2015.2313.

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1. Introduction

People frequently cheat or lie to pursue their self-interests.[1] However, to protect a positive self-concept, they also refrain from profitable acts of cheating (Mazar et al. 2008). In economics, two basic approaches to understand cheating have been used. Following Becker (1968), people maximize the (expected) utility of monetary outcomes, regardless of whether such an optimization requires lies or cheating. On the basis of a cost–benefit calculation, the would-be cheater decides whether to cheat or not. A different view assumes that people are basically honest and dislike lying or cheating based on norms, but circumstances may tempt them and can lead them to lie or cheat (Mazar et al. 2008). In other words, they trade off possibly internalized norms or social norms not to lie or cheat (Kant 1949) with the potential benefits.

In this paper, we are particularly interested in the circumstances that prompt people to cheat, keeping the costs and benefits of cheating constant. Such circumstances will be especially important in the design of behavioral mechanisms and institutions that reduce the amount or costs of cheating in situations involving limited verifiability or monitoring possibilities or in which the latter are (very) expensive. Our focus here is on the gain–loss frame (Kahneman and Tversky 1979, Tversky and Kahneman 1991) of the cheating option. Indeed, evidence from lottery choices suggests that people are more sensitive to losses than to equivalent-sized gains considered from a proper reference point. Although point estimates of the size of such loss aversion depend on the decision-making framework, a factor of 2 is often mentioned as the psychological weight attached to losses compared with gains (Tversky and Kahneman 1991). Loss aversion as a behavioral tendency has been applied in a multitude of economic environments to explain empirical behavior that is inconsistent with expected utility theory (e.g., Herweg et al. 2010, Herweg and Schmidt 2015). Based on the fact that losses loom larger than gains in lottery choices, we hypothesize that it is perceptionally different to cheat to gain a certain advantage than to cheat to not lose a certain advantage, even when the underlying outcome and incentives are identical.

Relevant real-world analogies to such framing differences or reference dependence pertaining to

[1] Lying and cheating are forms of dishonest behavior. Whereas lying is usually associated with sending incorrect signals or messages with the intent to deceive, cheating is often associated with a dishonest act. Obviously, the definitions do not provide a sharp distinction.

cheating readily come to mind. A recurrent example of cheating relates to welfare assistance. It is well known that individuals can cheat *to benefit* from welfare assistance. However, an individual can lose welfare benefits if she no longer fulfills the required conditions. Thus, individuals also cheat *not to lose* welfare benefits they have been receiving. For example, "a Shepherd resident who illegally collected more than $124,000 in Social Security benefits for himself and his daughter admitted he got greedy and dodged agency requests about his employment.... [The resident] worked and was paid 'under the table' to hide his income and to *avoid losing benefits* he was receiving from the Social Security Administration' " (*Billings Gazette* 2009, emphasis added). In the same vein, there is anecdotal evidence that people are ready to cheat to *gain* status, but more so not to *lose* face or status. A recent example is the case of Lance Armstrong, who "believed it was impossible to win the Tour de France without doping, so he doped, which meant he had to lie about doping to keep winning" (Hall 2013). Cheating to not lose tax benefits or not lose a public office in politics are further examples. Again, casual evidence seems to imply that cheating is more prevalent when avoiding the loss than when trying to gain an advantage or gain an office.

We devised a laboratory experiment based on a real-effort matrix task (Mazar et al. 2008, Gino et al. 2009) that addresses the impact of loss perception on cheating in a 2×2 factorial, between-subjects study design. The design varies the factors verifiability (monitoring performance is possible versus impossible) and the frame (cheating generates a perceptional gain versus allowing avoidance of a perceptional loss). All other determinants are held constant, allowing us to causally assess our main hypothesis.

The gain–loss frame is introduced in the experiment by the timing (and tangibility) of payments. In the perceptional gain frame, participants in the experiments are paid according to their (reported) performance, after they have solved a certain number of matrices in a given amount of time (ex post payment). In the perceptional loss frame, participants receive the maximum possible amount before they start working on the matrix task, but clearly knowing that they have to return any money that they do not earn with their (reported) performance (ex ante payment). In both cases the performance-based piece rate, i.e., the payment per correctly finished matrix, is the same, and it is announced in the beginning and common knowledge.

Our experimental results indeed indicate a very strong effect of advance payments. The level of reported performance—our measure for cheating—is doubled under advance payments compared with ex post payments when monitoring is not possible. Since the incentive mechanism is linear, this implies that advance payments are twice as expensive as ex post payments in the two conditions that allow for cheating. Notably, the timing of payment itself has no effect on performance when monitoring is possible. However, as soon as monitoring is credibly made impossible, reported performance increases with ex post payment, but much more so with advance payment. We interpret the results in terms of gain–loss framing of payments induced through the tangibility of payments in the advance payment setting.

The remainder of our paper is organized as follows. The following section provides an overview of the related literature. Section 3 presents the empirical strategy that we employ and formulates our main hypotheses. Section 4 discusses the results of our experiment. Section 5 concludes the paper by discussing implications and applications of our findings.

2. Overview of Related Literature

The traditional economic model—in the spirit of Becker (1968)—assumes that lying or cheating is not different from other actions. People lie or cheat if it increases their expected utility. However, more recently, a sizeable and quickly growing number of studies have addressed several additional aspects of lying or cheating in an economic context. We do not intend to survey the entire literature here (see, for instance, Ariely 2012, Abeler et al. 2014, Rosenbaum et al. 2014); we mainly focus on the papers that are most closely related to our approach and research question.

In economics, lies are frequently studied in two-person games, with a sender signaling to a receiver. In studies that address cheating, decision makers have the individual choice between an honest option and a dishonest option or a continuum between honest and dishonest choices. Most of the economics literature on lying and cheating started with an assessment of the question of whether people indeed follow a Beckerian approach (and cheat to the full extent possible) or whether people moderate the extent of their lying and cheating. Indeed, on average, the latter is true; i.e., people do not cheat as much as they can even if they forgo significant amounts of money when they remain honest (see, e.g., Gneezy 2005, Sutter 2009, Fischbacher and Föllmi-Heusi 2013, Gneezy et al. 2013). Reasons for restraining one's cheating and lying are numerous. Abstracting from the obvious influence of the detection probability (Rowatt et al. 1999, Lundquist et al. 2009), there might be a social norm or an internalized norm not to lie or cheat, and people might experience negative emotions when they lie or cheat (Batigalli et al. 2013). If that is the case, people are lying averse either because of social image concerns or because of self-image concerns. The combination of these concerns that could strongly depend on the context (think of an individual tax declaration versus a confession in front of a Catholic priest) determines the extent of lying or cheating behavior in combination with an individual's inclination to be honest and truthful.[2] Numerous circumstances that can contribute to a higher propensity of lying have been examined in the economics literature. Without purporting to be exhaustive here, the following determinants have been mentioned: people lie or cheat more when stakes and expected benefits are high (Gneezy 2005),[3] when the characteristics are prone to measurement error (Toma et al. 2008), when the benefits from cheating are shared (Wiltermuth 2011), if people expect not to be believed when they report private information in presence of an opportunity (Sutter 2009), if the specific content of the lie is less personal (Cappelen et al. 2013), when others lie (Gino et al. 2009), and after negative previous experience (Houser et al. 2012).

When it comes to the interpretation of gains and losses in situations that allow for cheating or lying, the literature is comparably small. Using hypothetical scenarios with professional tax preparers, Newberry et al. (1993) found that the preparers were more likely to sign tax returns containing a large deduction associated with an ambiguous tax aspect if the signing decision is made in relation to an existing client (a loss decision frame in the context of the study) compared with a situation where tax preparers attempted to win a new client (a gain decision frame). Using scenarios among self-employed and business entrepreneurs, Kirchler and Maciejovsky (2001) showed that tax compliance is higher when taxpayers expect a refund (a gain frame) than when they expect to pay additional taxes (a loss frame). In the same vein, Kern and Chugh (2009) demonstrated in a series of three experiments that people are more likely to engage in unethical behaviors when the outcomes are framed as possible losses, rather than as gains. All of the above-mentioned experiments are based on hypothetical scenarios, and the decisions are not monetarily incentivized.

[2] Sometimes lying may even be the norm. Such lies are also called "white lies" (see, e.g., Erat and Gneezy 2012). In the following, we abstract from them. We also disregard the large literature on promise keeping (e.g., Charness and Dufwenberg 2006, Vanberg 2008). There is also a large literature on sabotage in tournaments and contests that is clearly related to cheating (for a survey, see Chowdhury and Gürtler 2015). However, we have not found studies on sabotage that look at gain–loss framing.

[3] Some studies have also found the opposite. Using a field experiment on returning excessive change in a restaurant, Azar et al. (2013) show that customers who receive 10 extra shekels are less likely to return them to the waiter than those who receive 40 extra shekels. However, as the authors discuss, it might be harder to detect a small mistake in the change than a larger mistake; hence, some people might not realize the extra change given to them in the low-stake condition.

Most closely related to our contribution, Cameron et al. (2008)—also reported in Cameron and Miller (2009)—implemented an incentive-compatible experiment in which 10 anagrams had to be solved in a particular order, with (almost) unsolvable anagrams at the second and seventh place, and participants were not aware of this fact. Each solved anagram yielded \$1, but if participants were unable to solve one, they were not paid for any of the solved anagrams that came after it. Their main result is in line with our hypothesis, i.e., that an implemented loss frame has a tendency to increase cheating behavior compared with a gain frame. In a related study, based on a coin toss design, Shalvi (2012) showed that people are particularly inclined to behave dishonestly when such a behavior can help them turn a loss into a gain. Engström et al. (2015) provided evidence from real-world data on a large-scale level. They showed, based on a quasi-experimental setup using a regression kink and discontinuity approach, that individuals are more likely to claim deductions if their initial tax balance shows a deficit (i.e., is in the loss domain) than if not.

Gravert (2013) provided a link between entitlements and stealing. In her experiment, she found that participants who had earned their payoff according to performance were much more likely to take the (undeserved) maximum payoff than participants in a random payment scheme. Supposedly, an endowment effect has an impact on the inclination to cheat. Linking the endowment effect to reference dependence provides the connection between her study and ours. A similar effect is reported for goal setting by Schweitzer et al. (2004). Indeed, goals can serve as reference points (Heath et al. 1999), and unmet goals could put the decision maker in the domain of losses. Schweitzer et al. (2004) found in their laboratory experiment that unmet goals lead to a higher rate of unethical behavior, such as overstating performance. In Jacobsen and Piovesan (2016), a tax frame is combined with a cheating option. As expected, the tax frame is used as an excuse to rationalize cheating behavior more so than a neutral frame. The paper shows that framing is relevant for the degree of cheating, but it does not vary the framing over gains and losses.

Finally, Fryer et al. (2012) implemented a field experiment to examine the effect of incentives for teachers on the performance of students. They found that students trained by teachers who were given bonuses in the beginning of the year obtained better scores than those trained by teachers that received their bonuses at the end of the year. In other words, the prospect of losing a reward seems to motivate individuals to perform better than the possibility of gaining the same reward after the test ends.[4] In their paper, they did not take cheating into account as a potentially detrimental force, but in an earlier paper (Jacob and Levitt 2003), they noted that the "observed frequency of cheating appears to respond strongly to relatively minor changes in incentives" (p. 843).

In the next section, we present the design of an experiment that aims to test whether cheating levels differ in an environment that includes financial incentives framed either as a gain or as a loss. Given that the neoclassical cost–benefit weighing is identical in the two framings, we can detect whether the framing influences cheating levels. The unique contribution of our study is the systematic and causal assessment of a potential sensitivity of cheating to a gain–loss frame based on a large-scale real-effort study. Compared to existing studies, we can investigate possible interaction effects of the gain–loss frame and the availability of monitoring. Cameron et al. (2008), for instance, cannot rule out completely (even though it is unlikely given the task in their experiment) that the difference in reported performance between the loss frame and the gain frame is induced at least partly by a higher level of effort in the loss condition, regardless of whether monitoring is available (no option to cheat) or not (cheating is possible), because their experiment does not have a comparison of the frames under monitoring. In our 2×2 design, it is possible to disentangle potential incentive effects from the frame and the effect from monitoring. Our matrix task allows us to implement a more or less continuous cheating range, whereas the anagram task in Cameron et al. (2008) makes the decision quasi-binary, putting much more emphasis on deservingness of reward than in our case. Notice that it is possible to earn a decent amount of money in our experiment without cheating. Likewise, the piece-rate incentives in the matrix task resemble real-world working environment incentives. Nonetheless, we think of the findings in Cameron et al. (2008) and here as complementary.

The large-scale nature of our experiment compared with other laboratory experiments on dishonest behavior that in some way address gain–loss framing effects enables us to look at one additional variable of interest: a potentially different reaction to the framing across the two genders. There is a huge literature on gender differences in unethical behavior. Rosenbaum et al. (2014) reviewed 63 experiments studying dishonesty and discussed factors affecting it, including gender. For instance, Dreber and Johannesson (2008) implemented a sender–receiver game in which the sender had a monetary incentive to send a deceptive message to the receiver, showing that men are more inclined to lie than women are (55% versus 38%). The finding is consistent with results in Houser et al. (2012), who used the coin-throw paradigm. Looking at the extent of lying rather than on the propensity, men are also more dishonest (about twice as much as women), as reported by Friesen and Gangadharan (2012).[5] We are not aware of results in the literature on gender differences based on potential gain–loss framing effects in decisions that might involve cheating. The literature on simple lottery choices seems to be inconclusive with regard to a gender difference in loss aversion (for surveys, see, e.g., Eckel and Grossman 2008, Croson and Gneezy 2009).

3. Experimental Design, Identification Strategy, and Hypotheses

We use an experimental design for our real-effort laboratory experiment that was introduced by Mazar et al. (2008); it is called the matrix task. More precisely, we implement a 2 (gain or loss) × 2 (monitored performance or unmonitored performance) between-subjects design with a total of 600 experimental participants (see Table 1). Individuals in the laboratory are given a sheet of paper with a series of 20 different pairs of matrices containing nine noninteger numbers each and are asked to find in each of the pairs two numbers that add up to exactly 10 (for an example of a matrix pair, see the online appendix, available as supplemental material at https://doi.org/10.1287/mnsc.2015.2313). In written instructions (see the online appendix), participants are told that they have five minutes to solve as many of the pairs as possible and that they get paid based on how many they solve correctly. Each correctly solved pair is worth €1.50; this piece rate is clearly stated in the instructions.

People can cheat on the matrix task in the two "cheating conditions" because the procedure in the instructions involves destroying the solutions. Subjects are asked to count their correct answers on their own, report the results on a result form, and then put their work sheets through a paper shredder at the back of the room. They then state to the experimenter how many pairs of matrices they solved correctly and get paid accordingly. This procedure is made clear in the instructions. Regardless of whether the shredder condition applied or whether the experimenter

[4] Interestingly, Levitt et al. (2013) do not observe a significant difference between gain and loss frames for student test performance in schools.

[5] Erat and Gneezy (2012) looked at gender difference for white lies. Women tell more altruistic white lies than do men if the lie hurts the other person only a little but helps him or her a lot, and they are less likely to tell Pareto white lies than are men. Field evidence from free riding on the bus (Bucciol et al. 2013), returning excess change at the restaurant (Azar et al. 2013), and cheating on exams (Tibbetts 1999) also reported a gender gap in cheating, with men being more likely to cheat.

Table 1 Our 2 × 2 Factorial, Between-Subjects Experimental Design

	Monitored performance (No cheating opportunity)	*Unmonitored performance* (Cheating opportunity)
Gain frame (payment ex post; according to (self-reported) performance)	GM: Control treatment ($N = 150$)	GU: Level of cheating in gain frame ($N = 150$)
Loss frame (payment in advance and reimbursement according to (self-reported) performance)	LM: Effect of loss frame on performance ($N = 150$)	LU: Level of cheating in loss frame ($N = 150$)

Note. N is the number of observations.

could verify the number of correctly solved matrices, the remuneration for each solved pair was always €1.50. After verifying the number of solved matrices by the experimenter in the "noncheating conditions," the work sheets were also shredded.

Our gain frame corresponds to payment of the participants after they solve the matrix task according to the number of solved matrices. The loss frame is implemented by payment of the participants in advance, asking for the excess amount to be given back to the experimenter at the end of the experiment. Again, this procedure was clearly described in the experimental instructions. In the loss frame, we gave each participant the maximum possible amount of €30 (20 pairs times €1.50) in advance in cash.[6] The exact wording in the instructions for treatment LU was as follows (translated from the French original): "Once the 5 minutes are finished, please report on the sheet RESULTS the number of correct answers you had. Subtract the corresponding number of euros for the number of unsolved pairs of matrices from the envelope, keep the earned amount with you, and give back the envelope to the experimenter with the remaining money. Destroy your TASK sheet through the paper shredder in the back of the room. Give back to the experimenter only your RESULT sheet and the remaining money."

Introducing sufficient levels of loss aversion in a standard utility model taking cheating aversion into account would immediately provide our main hypothesis, i.e., as indicated earlier, that the gain–loss frame will impact performance reports. Since the result is obvious, we omit a formal model here. As already discussed, we expect to observe a higher (reported) performance in loss-framed treatments than in gain-framed treatments. Moreover, because in our setting there are little exogenous costs related to cheating (full anonymity, no possibility of individual detection, etc.), the standard prediction is that when given the opportunity to cheat, people will take it because it corresponds to profit maximization. Hence, we expect the unmonitored performance to exceed the monitored performance also in the gain frame. This prediction would lead to a reported performance of solved matrices up to the maximum (i.e., 20 pairs). However, existing papers reported nonmaximal levels of cheating in comparable experimental situations (Mazar et al. 2008, Fischbacher and Föllmi-Heusi 2013, Abeler et al. 2014), and several theoretical papers (starting with Crawford and Sobel 1982) argued in favor of a trade-off between psychological costs of cheating and monetary benefits. Hence, our expectation is that cheating levels are, on average, bounded away from the maximum.

Hypothesis 1. *A higher unmonitored performance will be self-reported in the loss frame compared with the gain frame.*

Hypothesis 2. *A higher unmonitored performance will be self-reported than the actual monitored performance both in the gain frame and the loss frame. Yet the self-reported unmonitored performance will not be at the maximum.*

Based on existing studies on potential gender differences in cheating surveyed in the previous section, we can also formulate a hypothesis on gender effects. Note, however, that any gender effect could be modulated by gender differences in task performance, and thus the direction of the overall effect is an empirical question. We do not have a directed hypothesis with regard to the gain–loss framing and gender.

Hypothesis 3. *Men are more likely to cheat than women and will consequently self-report higher levels of performance in both unmonitored treatments.*

By comparing performance in treatments GM and LM, we are able to explore whether a loss frame in itself improves monitored performance ceteris paribus, as exisiting evidence in the literature suggests. By comparing the level of performance in treatments GU and LU, we are able to evaluate to what extent a loss frame pushes people to behave more dishonestly than the gain frame.[7] This will fully test

[6] Obviously, the maximum amount to be earned (€30) is comparably high for a very short experiment.

[7] As stressed by a referee, it is very likely that any overreporting is due to cheating, but given our procedure in the unmonitored treatments, we can of course not completely rule out the possibility of outlier performers driving parts of the effects.

Hypothesis 1. By comparing performance in treatments GU versus GM and LU versus LM, we test Hypothesis 2. Hypothesis 3 can be tested for all our treatments and for pairwise comparisons.

The experiment was conducted in the Laboratory for Experimentation in Social Sciences and Consumer Behaviour (LESSAC) in Dijon in September and October 2012 as well as January 2015. A total of 600 subjects (first- and second-year students from various academic programs that had not participated in any economic experiment before) were recruited via the Online Recruitment System for Economic Experiments (Greiner 2015) and randomly allocated to sessions (31 sessions in total) and one of the four treatments. Each subject participated in only one session. To make instructions and all procedures common knowledge and thereby increase the credibility of the experimental procedures, each session implemented only one treatment. However, treatments were randomized over sessions and day times.

Experimental participants remained anonymous throughout the experiment, and cash payments were made privately. The gender of each subject was recorded by the experimenter when administering payments. An experimental session lasted for about 30 minutes. Subjects earned an average of €8.60 (at LESSAC, show-up fees are not commonly used). All sessions were conducted by the same female experimenter.

4. Results

We start by looking at the main treatment effects. Table 2 provides a descriptive overview of our results. First, it is worthwhile to note that we do not find a significant difference in performance between loss frame and gain frame payments with monitored performance (two-sided Mann–Whitney U-test, $p = 0.66$). For our task and setting, there is no additional motivational effect of putting ex ante money on the table. Put differently, there is no significant incentive effect of the frame in the monitored condition. This result is consistent with one from Levitt et al. (2013), who found in their field experiment that monetary and nonmonetary incentives framed as losses do not induce better test scores among students than those framed as gains.

Second, we observe considerable cheating when taking reported self-performance as a proxy. In the unmonitored treatments, the number of matrices solved is higher than in the corresponding monitored ones. Comparing the gain frame results under monitored and unmonitored performance, we obtain an increase in the number of pairs of matrices (reported as) solved of about 43% from 3.61, on average, to 5.15 (two-sided Mann–Whitney U-test, $p < 0.001$). However, the more important comparison for our study is between monitored and unmonitored performance in the loss frame. Here, the increase in the number of pairs of matrices (reported as) solved is approximately 296%. The difference between 3.45 and 10.22 matrices, on average, is highly significant (two-sided Mann–Whitney U-test, $p < 0.001$).

Finally, it is immediately clear that the frame matters in the unmonitored conditions, i.e., when there is the opportunity to cheat. Whereas the change in performance from the gain to the loss frame is even negative with monitoring (though, not significantly so), it is strongly positive without monitoring. The self-reported number of solved matrices rises from 5.15 to 10.22, on average. This difference is highly significant (two-sided Mann–Whitney U-test, $p < 0.001$). Since we control for all relevant determinants, the average differences can be attributed to differences in the extent of cheating by our participants.

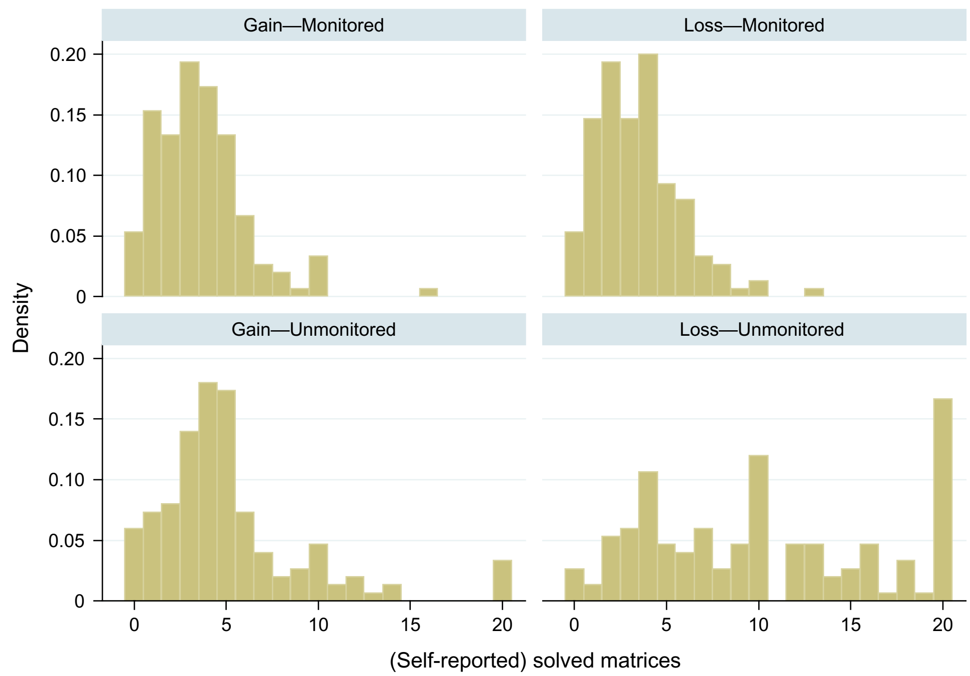
It is also interesting to look at the distributions of the reported number of matrices solved (see Figure 1). Whereas very few participants solve more than 10 matrices under monitoring, many people report 10 to 20 solved matrices under no monitoring. Interestingly, only about 16.67% of the participants report the maximum performance of 20 solved matrices in the loss frame payment treatment without monitoring. Thus, we confirm results from previous studies (e.g., Fischbacher and Föllmi-Heusi 2013) that imply that few people cheat to the full possible extent (maximizing payoffs). Instead, many people choose to report levels of performance that do not seem outrageous. Whether this behavior is due to self-image concerns,

Table 2 Number of Pairs of Matrices (Reported as) Solved

	Monitored performance (No cheating opportunity)	*Unmonitored performance* (Cheating opportunity)	*Two-sided Mann–Whitney U-tests*
Gain frame (payment ex post, according to performance)	GM: 3.61 (2.48)	GU: 5.15 (4.09)	$p < 0.001$
Loss frame (payment in advance and reimbursement according to (self-reported) performance)	LM: 3.45 (2.27)	LU: 10.22 (6.29)	$p < 0.001$
Two-sided Mann–Whitney U-tests	Not significant	$p < 0.001$	

Note. Standard deviations are shown in parentheses.

Figure 1 **(Color online) Number of Pairs of Matrices (Reported as) Solved—Distribution**



social image concerns, or potential beliefs regarding the experimenter's response to outrageous performance reports, is an interesting question that cannot be answered in our setup.

Result 1 (Related to Hypothesis 1). Cheating is significantly more often observed in the loss frame than in the gain frame: self-reported performance increases from 5.15 to 10.22 solved matrices.

Result 2 (Related to Hypothesis 2). Without monitoring, the self-reported performance is significantly higher than the actual performance with monitoring both in the gain and in the loss frame. However, cheating is not going to the payoff-maximizing level.

We now address potential gender effects, stressing that the analysis is exploratory. Table 3 provides an overview of averages. Women's actual performance under monitoring is slightly positively affected by the framing going from the gain to the loss frame, whereas men's actual performance is slightly negatively affected (both far from being significant on conventional levels, with both $p > 0.54$; two-sided Mann–Whitney U-tests).

The effect of a loss frame on self-reported performance in the unmonitored conditions seems stronger for men than for women. For men, we observe an increase from 5.62 to 11.86 (i.e., +211%), whereas for women, the increase goes from 4.73 to 8.44 (i.e., +178%). However, the difference in self-reported performance from framing is highly significant for both genders (two-sided Mann-Whitney U-tests, $p < 0.001$). More generally, all the significant results for the entire sample remain significant when looking at the two genders separately.[8]

Result 3 (Related to Hypothesis 3). For both genders, (self-reported) performance is increased significantly from the monitored to the unmonitored conditions. The reaction of men to the framing is stronger than that of women.

All our nonparametric results are confirmed when using Tobit regressions that take the censoring of the dependent variable, the (self-reported) number of solved pairs of matrices, into account.[9] Table 4 gives the results of three models, one for females only, one for males only, and one for both genders, introducing the appropriate dummy variables and interaction terms. The coefficients reveal that both genders cheat when it is possible (the unmonitored conditions), but the extent of cheating is larger for men than for women. As already discussed above, males react more strongly to the gain–loss frame than females. Notice that the frame has a significant impact on the (reported) performance of females and males, and the

[8] We do not aim to explain the gender difference in the two monitored treatments. The difference in performance of men and women is significant at the 5% level in treatment GM (two-sided Mann–Whitney U-test, $p = 0.01$), but not in treatment LM (two-sided Mann–Whitney U-test, $p > 0.1$).

[9] Ordinary least squares regressions provide qualitatively the same results and similar levels of significance. The same holds true for regressions that include session dummies to account for session-specific effects.

Table 3 Number of Pairs of Matrices Reported as Solved

	Monitored performance			Unmonitored performance		
	(All)	Female	Male	(All)	Female	Male
Gain frame	**3.61**	3.12 (77)	4.12 (73)	**5.15**	4.73 (79)	5.62 (69)
Loss frame	**3.45**	3.16 (89)	3.86 (61)	**10.22**	8.44 (72)	11.86 (78)
Two-sided MWU tests	n.s.	n.s.	n.s.	**$p < 0.001$**	$p < 0.001$	$p < 0.001$

Notes. Bold values show the same information (averages) as in Table 2. The numbers of observations are in parentheses. Gender information is missing for two observations. MWU, Mann–Whitney *U*; n.s., not significant.

Table 4 Tobit Regression Explaining the (Self-Reported) Number of Pairs of Matrices Solved

(Self-reported) number of pairs of matrices solved	*Female*	*Male*	*All*
Female	—	—	-3.78^{***}
			(0.72)
Gain frame	-3.85^{***}	-6.81^{***}	-6.72^{***}
	(0.64)	(0.82)	(0.73)
Monitoring possible	-5.48^{***}	-8.58^{***}	-8.48^{***}
	(0.62)	(0.84)	(0.75)
Gain frame × *Monitoring possible*	3.84^{***}	7.01^{***}	6.92^{***}
	(0.88)	(1.18)	(1.05)
Female × *Gain frame*	—	—	2.85^{***}
			(1.02)
Female × *Monitoring possible*	—	—	2.97^{***}
			(1.02)
Female × *Gain frame* × *Monitoring possible*	—	—	-3.05^{**}
			(1.44)
Constant	8.48^{***}	12.35^{***}	12.27^{***}
	(0.46)	(0.56)	(0.50)
Log likelihood	−845.29	−782.74	−1,634.29
No. of observations	317 (293 unc.)	281 (246 unc.)	598 (539 unc.)

Notes. Standard errors are reported in parentheses. unc., uncensored.
$^{**}p < 0.05$; $^{***}p < 0.01$.

interaction term of the frame with the monitoring condition countervails this effect.

5. Discussion and Conclusion

We have shown that ethical decision making can be vulnerable to the power of framing. In the monitored decisions, gain–loss framing does not affect performance. Without monitoring, the self-reported performance increases significantly over the actual performance in both the gain and loss domains. We interpret this increase as cheating. Most importantly, many people cheat more to avoid a loss than to acquire a similar gain when cheating is possible. Interestingly, men react more to the framing than women. There are at least two mutually nonexclusive rationales that can explain why we observe such a strong framing effect in our experiment when monitoring is impossible. First, the loss frame (advance payments) can provide individuals with a construal that makes them feel entitled to the money received at the beginning. Indeed, dishonest behavior could be just a way to protect this entitlement, making dishonesty more acceptable than in the gain frame condition. In other words, the money provided in advance serves as a reference point that is higher than the reference point of participants in the gain frame. If losses loom larger than gains (Kahneman and Tversky 1979; see also Brewer and Kramer 1986), then individuals in the loss frame (gain frame) are more (less) likely to cheat.

A second rationale relates to the insight that seeking to avoid a loss could make an unethical decision more acceptable not only by the individual but also by third parties. If the norm of not cheating is less strict in the loss domain, many lying aversion models would predict more lying under losses than under gains. One emotional reason for such an asymmetry could be a reduced level of guilt felt, when lying under losses than when lying under gains. Somewhat related, Kahneman et al. (1986) showed that individuals are more willing to accept company decisions that would otherwise be considered as unethical if the company attempts to compensate for losses than if it follows the same action in order to increase its profits.

There is some evidence that guilt could be perceived differently by men and women (Ludwig and Thoma 2014), which is consistent with the gender difference that we observe for the framing.

Our main finding seems relevant in several ways. First, it may help to identify circumstances under which people are more tempted to cheat. Indeed, when individuals are in a situation that is construed as a possible loss from a reference point (e.g., being fired, losing welfare benefits, paying more taxes, retaining a customer), they seem to be more likely to adopt unethical behaviors compared with a situation framed as a gain. For instance, if a person's situation changes, and the change increases a person's tax liability compared with the previous years, this person might be tempted to a greater extent to evade taxes than someone who is supposed to pay the same tax amount as in the preceding years. A similar argument holds for preliminary tax information or statements that might put people in a loss state and increase inflated or fraudulent claims (see Engström et al. 2015).

Second, if resources for monitoring are limited, ceteris paribus, it might be more efficient to target individuals who risk losing something rather than individuals who risk winning something. For instance, when looking at welfare fraud, our findings indicate that monitoring strategies should focus on those who are already beneficiaries and stand to lose parts of their benefits. In sports contests, antidoping authorities could focus their efforts slightly more on previous winners and record holders that stand to lose their status or titles rather than on newcomers. Importantly, these are often cheating environments that are interactive; the level of monitoring is not completely exogenous but chosen by an authority. Hence, the results from our individual (noninteractive) working task have to be applied with caution and cannot be translated directly to all relevant interactive situations. Furthermore, focusing monitoring efforts on specific groups might be perceived as unfair or inappropriate in some situations (e.g., existing beneficiaries versus new beneficiaries from a welfare program).

Third, a natural implication of our result for decision makers is to devote enough attention to gain–loss perception and to potentially unintended effects from framing. Consequently, an inexpensive policy (whenever available) with first-order effects on cheating would be to reframe situations, avoiding loss framing.

Our findings also point toward two additional interesting issues that have, however, not been at the center of our interest. Loss frames or ex ante payments have been sometimes shown to be or used as performance-enhancing devices. The setup we implement is related to a work environment with incomplete contracts and nonverifiability. Our findings indicate that the positive view of advance payments as a means to increase effort reciprocity (e.g., Fryer et al. 2012) has to be qualified. When cheating is possible, ex ante payments (loss frames) can obviously backfire and can lead to an increase of unethical or dishonest behavior. Whether and when potential cheating effects offset positive incentive effects is an open research question. It will potentially depend very much on the strength of the reference point and feelings of deservingness.

Furthermore, gender differences are not trivial. Females seem to cheat to a lesser degree than males, even though cheating in the unmonitored performance conditions is still substantial among women. However, they seem to be somewhat less prone to the gain–loss framing differential than men. It is important to note that gender is obviously not a treatment variable, and it could therefore interact with the treatment variables and the task at hand in several ways. Thus, we do not want to overemphasize the gender differences that we find.

Several extensions seem to present themselves as relevant for future research: For instance, it would be worthwhile to analyze whether the gain–loss difference in cheating is mainly driven by the perception of social norms depending on a reference point or by internalized reactions such as difference in feelings of guilt. There might even be other explanations for the observed difference that we could not uncover in our noninteractive setting. Hence, extending our experimental design to a fully interactive (game) environment seems worthwhile. Field experiments using gain–loss framing as a device to limit cheating would be another interesting opportunity for future research. Finally, the gender differences in the reaction to the gain–loss framing are surprising. If at all, one would probably have expected women to be more sensitive to the framing than men (Croson and Gneezy 2009, Ellingsen et al. 2013). We have only post hoc explanations for this finding, and it would be good to first have it substantiated in future research and then have its causes analyzed in greater detail. Obviously, it would be useful to also look at whether our main result is robust to different sociocultural settings (see, e.g., Ariely et al. 2014, Mann et al. 2014), even though there is no a priori reason to believe that our participants, French university students, are somewhat more particular than other cohorts of experimental participants in the economics laboratories around the world. Finally, we believe that the incentive effects of gain–loss framing in monitored environments are an interesting area of research. Deriving conditions under which a loss frame elicits higher levels of effort and when it does not seems a worthwhile empirical exercise.

Supplemental Material

Supplemental material to this paper is available at https://doi.org/10.1287/mnsc.2015.2313.

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