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Measure for measure: Effects of money exposure, reward size and loss aversion on cheating

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A B S T R A C T

People sometimes behave dishonestly to collect undeserved monetary rewards. Prior research has shown that people put more effort into avoiding monetary losses than into making gains, and accordingly they cheat more to avoid losses than to acquire the equivalent amount (loss aversion). However, there has been a lack of research about how reward size and money exposure affect levels of cheating. Using a real effort task, we implemented a between-subjects experimental design to test the effects of framing (loss vs gain), reward size (small vs large) and money exposure (money vs no money) on individual real performance and cheating levels. The results revealed no significant differences in real performance. However, for cheating levels, all two-way interaction effects turned out to be significant (i.e., frame by size – frame by exposure – size by exposure). To disentangle the effects of the loss frame on cheating levels, a double moderated model was tested with reward size and money exposure as moderators. The model was significant with conditional effects revealing that the loss frame generally causes increased cheating level unless (i) participants were informed about a possible large reward they had not been exposed to, and (ii) participants were informed about, and exposed to, a small reward. Our results offer a partial replication of the finding that the level of cheating is higher within the loss frame than in the gain framing, which suggests that the relationship between framing and cheating behaviour can be moderated by other variables such as reward size and exposure to a reward. They also pose new questions for future research about complex joint effects on cheating behaviour, such as the combined influence of framing and default choices.

1. Introduction

Immoral behaviour is frequently stigmatized in human societies because of its potentially harmful and even dangerous social consequences. Despite this stigma, instances of immoral behaviour such as dishonesty or cheating abound, and no human society is immune from them. They are commonly found in personal relationships (e.g. cheating to the partner), educational contexts (e.g. cheating on exams), the civic sphere (e.g. cheating on tax declarations), and in the financial world (e.g. fraud). It is therefore not surprising that the literature on dishonest behaviour – and on cheating in particular – has been steadily growing in recent decades.

The traditional economic approach to cheating entirely dispenses with the moral dimension and assumes that people are willing to cheat insofar as it is instrumental to the maximization of their reward, suitably measured (e.g. in terms of monetary outcomes; Becker, 1968). For example, employees cheat on their own performance to keep the job and reap monetary incentives. However, more recent research has questioned the assumption that people are willing to violate norms of conduct whenever it is convenient to them. In fact, it turns out that people do indeed lie, but not as much as they could to their own advantage (e.g. Fischbacher and Föllmi-Heusi, 2013; Sutter, 2009). On the other hand, children who have not been exposed yet to a full socialization into social norms of honesty tend to cheat more the larger the associated reward and be consistent in their lying behaviours through multiple tasks; however, only young girls but not young boys seem to be relatively loss-averse in their cheating habits (Markiewicz and Gawryluk, 2020). Explaining the reasons behind such partial moral compliance is therefore an important research question.

In general, two main lines of thought can be identified in the literature. Either people could basically be dishonest but despite being interested in maximizing their monetary outcomes, they might choose not to cheat whenever convenient as a result of an internal moral con-

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flict of some kind, which cannot be explained by strategic considerations but likely depends on psychological costs (Gneezy, 2005; Gneezy et al., 2013; Abeler et al., 2014) or because of an unfavourable cost-benefit balance (Shalvi et al., 2011). Or people could basically be honest although circumstances might tempt them to lie (Mazar et al., 2008) to protect their own monetary interests as well as to maintain a consistent self-image (Ariely, 2012).

Research on the determinants of cheating behaviour needs to consider the role of many different factors: the particular nature of the situation, individual characteristics (e.g. personality traits) and the nature and structure of the rewards can all effect the inclination to cheat or not, as well as the level of cheating. In particular, in the spirit of Prospect Theory (PT - Kahneman and Tversky, 1979), according to which '*losses loom larger than gains*', and subsequent research on endowment and loss-aversion effects on performance (e.g. Kahneman et al., 1991; Shah et al., 1998), it has been suggested that a loss-framed situation should exert a different influence on cheating behaviour than a gain-framed situation.

However, the evidence from the literature is mixed. Some studies using a performance-based paradigm have shown that, at the aggregate level, self-reported performance in an unchecked condition (i.e. when a participant has the possibility to lie) is significantly greater than the actual performance in a checked condition (i.e. when a participant has no possibility to lie) and that this difference is significantly larger in a loss-framed condition (Grolleau et al., 2016). Other studies have found the same frame effect on individual cheating levels for non-performance-based reward schemes (Hilbig and Thielmann, 2017; Schindler and Pfattheicher, 2017). However, little evidence has been provided about individual levels of dishonesty in performance-based cheating contexts (Friesen and Gangadharan, 2012). Moreover, prior studies have not addressed the issue of whether partially dishonest behaviour (i.e., the fact that people cheat in some circumstances but not, or less, in other seemingly analogous ones) can be attributed to specific features of the reward that increase or decrease the salience of guilt from moral transgression and thus influence the choice to cheat as well as the level of cheating. We address this specific issue in our experiment, working with the same real effort task used by Mazar et al. (2008), and manipulating the incentive schemes for framing (gain vs loss), reward size (small vs large) and money exposure (money vs no money). Moreover, we discuss in more detail the relationship between reward size and cheating in Section 2.2 below.

The value added of our study is that we show how complex effects from the interplay of several factors may arise, providing new insights and challenges to theoretical formulations. Apparently established phenomena such as loss aversion prove to be more nuanced once they are tested in an environment that approaches that of an actual organization, as resulting from our experimental design. We expect that our results will stimulate further research on the joint influence of several factors on cheating behaviors, helping us better understand the deep motivations and the behavioural variety of cheating, with important implications for the design of incentive schemes and policy guidelines.

The remainder of this paper is organized as follows: a review of the related literature is presented in Section 2; the design of the experiment and our methods are described in Section 3; the results are reported in Section 4; and finally, the results are discussed in Section 5, which concludes the paper.

2. Literature background

2.1. Dishonesty

In line with the traditional approach of Gary Becker, it has long been assumed that cheating (and dishonest behaviour more generally) is merely another way to pursue monetary maximization, and the decision to engage in cheating behaviour is based on simple cost-benefit computations (Shalvi et al., 2011). According to this perspective, people are driven to lie whenever it increases their expected utility and to cheat as much as needed when offered the opportunity.

However, people tend to abide by social norms more than economists have long assumed. The recent literature contains a growing body of evidence in which opportunistic cheating and dishonesty is far less common than expected. Although people engage in dishonest behaviour, they do it with moderation and contextual fine tuning and are not always willing to lie and deceive as much as they could to their maximum benefit, although this entails giving up part of the reward (Fischbacher and Föllmi-Heusi, 2013; Gneezy, 2005; Sutter, 2009). A meta-analysis has shown that people attach some value to truth-telling, as they typically tend to give up more than half of the potential gains from cheating (Abeler et al., 2019).

Amongst the various proposed explanations, the ones that have received substantial attention are the cheater's fear of being exposed (Lundquist et al., 2009; Rowatt et al., 1998) and the desire to maintain a self-concept of honesty (Mazar et al., 2008). In the former case, the critical variable is the probability of being exposed and the related consequences compared to the relative benefits of cheating, which leads to a trade-off such that partial dishonesty is a likely optimal solution; in the latter case, partial dishonesty is instead determined by the amount of cheating that people are able to admit without creating a conflict with their self-image of honesty (Shalvi et al., 2011). Another alternative explanation for partial dishonesty is social norm compliance, in which moral transgression beyond a certain threshold triggers negative social emotions such as guilt so that, as a result, people manifest some form of guilt aversion (Battigalli and Dufwenberg, 2007, 2009; Battigalli et al., 2013; Charness and Dufwenberg, 2006).

In this vision, fear of exposure, self-image or social norms act as 'buffers' for a basically dishonest human nature and contribute to keeping it within socially functional limits. On the other hand, pre-registered and high-powered studies such as Dimant et al. (2020) show that norm-nudging, both in empirical and normative forms, is generally ineffective in that it fails to change norms and may even lend itself to instrumental, self-serving distortion in favour of cheating. Dimant and Shalvi (2022) find that a better alternative in this regard is offered by meta-nudging, that is, addressing dishonesty by eliciting behavioural change in a target group of social influencers who in turn affect the behaviour and norm compliance of a larger number of individuals.

It might alternatively be the case, however, that humans are basically honest and are only occasionally tempted to cheat – particularly in certain specific situations. In this case, rather than looking at factors that control cheating behaviour, we have to look for factors that promote it. Magnitude effects have been reported, for instance, such that people tend to lie more when the bet and the expected payoff are higher (Boles et al., 2000; Chib et al., 2012). An increase in cheating behaviour has also been recorded as a result of a previous negative experience (Houser et al., 2012), when others also lie (Gino et al., 2009), when the benefit is shared with others (Wiltermuth, 2011) or when the environmental context plays a role (Cappelen et al., 2013).

The role of individual variables such as gender is, however, unclear: whereas Clot et al. (2014) found that women tend to cheat more, Conrads et al. (2017) reported the opposite result; Muehlheusser et al. (2015) did not find significant differences between genders as to cheating behaviours.

The tendency to lie more frequently has also been related to personality traits and cognitive abilities, assuming that individuals with better cognitive abilities are not only more able to discern when it is more profitable to lie, but also, when this is the case, that they can be more effective liars. In this sense, whereas personality traits rule general behavioural trends for honesty/dishonesty depending on context and circumstances, intelligence draws the line beyond which cheating becomes an option – and to what extent. More specifically, individuals who score low in agreeableness and highly extroverted intelligent individuals tend to lie more, which suggests that intelligence may mediate the relation-

ship between personality and tendency to lie (Sarzyńska et al., 2017).
Loss Aversion & Dishonesty

The phenomenon known as loss aversion was first described in 1979 by Daniel Kahneman and Amos Tversky, who showed how often human beings violate the assumptions of expected utility theory (EUT; Von Neumann and Morgenstern, 1944) and proposed a new model, prospect theory (PT), which provides a better fit to observed behavioural patterns. PT is based on two basic blocks: the weighting function $\pi(p)$, which converts probabilities p into subjective weights, and the value function v, which converts the gains and losses into subjective values. The value function v has properties that refer to three fundamental hypotheses, as stated in the original version of PT, which derived directly from experimental observation: reference dependence (people evaluate prospects in terms of gains or losses from a status quo reference point rather than from absolute levels of wealth), decreasing sensitivity (v is concave in gains and convex in losses) and loss aversion (as v is steeper for losses than for gains, a loss has a larger psychological impact than an equal gain). Consequently, human behaviour is more sensitive to the prospect of a loss than to that of a gain, and choices should consequently be more strongly driven by the motivation of avoiding a loss than of acquiring an equivalent gain (Tversky and Kahneman, 1981).

Since it was first formulated, PT has been widely accepted as descriptive model of human choices and increasing attention has been devoted to the investigation of loss framing effects (Tversky and Kahneman, 1981) on performance (e.g. Shah et al., 1998) and, more recently, on (dis)honest behaviour, both at the individual and aggregate levels (e.g. Boyce et al., 2013). Various alternative strategies have been adopted to assess cheating and its levels (for a review, see Garbarino et al., 2017). The literature currently offers two main approaches to study cheating for economic rewards: incentive schemes based on hypothetical scenarios (non-performance-based paradigm) versus economic reward for performance in a real effort task (performance-based paradigm).

For tasks based on hypothetical scenarios (e.g. the 'Die under the cup' task[1]), recent research has reported conflicting results, as increased cheating may emerge both in a loss frame (Schindler and Pfattheicher, 2017) and in a gain frame (Blanco et al., 2015), whereas in other cases no differences between frames have been found (Ezquerra et al., 2018). Petrishcheva et al. (2022) found that loss aversion effects also apply to cheating behaviour when the reward is intangible, as in the case of social image. For tasks based on real performance (i.e. real effort tasks), however, research has yielded more consistent findings, as the loss frame is unambiguously found – although at an aggregate level – to promote higher cheating levels compared to an equivalent gain frame (Cameron and Miller, 2009; Grolleau et al., 2016) and in association with higher performance (Nagel et al., 2021). Taking into account factors with a clear potential influence on cheating such as positions of power and the consequent incentives to be corrupt, it is interesting that Kim and Guinote (2022) found, though, that power differences in corruption levels only tend to occur in a gain, and not in a loss, frame. In this complex and multifaceted panorama, growing neuroscientific evidence suggests that many behavioural effects such as loss aversion or tendency to lie depend upon functional and structural variability across individuals on neural (e.g. Canessa et al., 2013) and genetic grounds (Shen et al., al.,2016). Also, considering effects on cognitive function, Bogliacino and Montealegre (2020) found that, in a real effort task, cognitive load (and consequent inaccuracy) is affected by asset losses but not by income losses, without any significant effects on loss aversion or cheating. Therefore, to disentangle the role of individual differences in cheating behaviour across different incentive schemes and frames, it is necessary, despite the increased difficulty, to study cheating at the individual level.

This calls for special care in experimental design. For instance, the influence of frame can sometimes be affected from exposure. Unfortunately, previous studies did not properly distinguish between frame and exposure, as participants in the loss treatment were, almost always, not just told about the possibility to lose money but were also exposed to the full prospective reward and sometimes also had the opportunity to interact with money. There is, however, growing evidence that being exposed to and thinking about money leads people to think in 'business terms', and this situational framing is more easily conducive to unethical behaviours, such as lying, cheating and acting in one's self-interest without regard to others (Kouchaki et al., 2013).

Another factor that can make a difference at the individual level is the effect of the size of the reward. At the aggregate level, reward size is typically found to have an effect only in a social context of choice. Whereas it is commonly believed that the size of the reward typically favours increased cheating – and, in particular, cheating increases the more it is incentivized – it turns out that such incentives are effective when they bring about positional advantages (i.e. increasing an individual's reward compared to that of other participants, e.g. Conrads et al., 2013; Boles et al., 2000; Gneezy et al., 2013), but no differences have been reported in studies in which cheating only increases the participant's reward in the absence of social comparisons (e.g. Fischbacher and Föllmi-Heusi, 2013; Gino et al., 2013; Mazar et al., 2008; Wiltermuth, 2011). Kaushik et al. (2022) find that, in a performance-based context, financially rewarding cheating is favored by the salience of social comparisons but also by psychological rewards in the absence of monetary payments. As to framing effects, Garbarino et al. (2019) found that cheating in a loss-aversion frame becomes more likely the larger the loss that is avoided by cheating. Moreover, in a recent study on a Vietnamese sample, Huynh (2020) found that cheating in a coin-flip experimental setting only emerges in a loss aversion frame but not when small monetary incentives are provided in a non-framed condition. Additionally, a recent meta-analysis concluded that the size of the reward is not particularly relevant in deciding whether to cheat (Abeler et al., 2019). This seems to suggest that the loss frame matters more in the emergence of cheating than the size of the reward. However, in several such studies, the compared rewards did not differ much in terms of size (e.g. $0.50/$1 vs $2; Gino et al., 2013; Mazar et al., 2008). Recent research using a non-performance based cheating paradigm has reported that reward size becomes relevant when considering individual differences. Specifically, when individual characteristics are taken into account, four behavioural patterns emerge: (i) brazen liars, who almost always cheat, no matter the size of the reward; (ii) corruptible individuals, whose level of cheating increases along with the incentives; (iii) small sinners, who cheat when incentives are small (minor moral transgressions) but refrain from cheating when stakes get big; and (iv) honest individuals, who almost never cheat no matter the size of the reward (Hilbig et al., 2017). Therefore, to study framing effects, the influence of the reward size can be better analysed by assessing cheating at an individual level. Indeed, when consider framing with a focus on individual differences, the fact that reward size can elicit different moral behaviours can work in subtle ways: clearly, a higher reward may incentivize people to cheat more, but also, conversely, small rewards can stimulate honesty (Wang and Murnighan, 2016). As revealed by the extensive meta-analysis by Gerlach et al. (2019) that covers 565 experiments on four different experimental paradigms, the existing evidence leaves little room for easy generalizations. Cheating depends both on situational factors such as reward size and on individual factors such as gender and age, and there are even relevant differences between laboratory and field settings, with a larger relevance of cheating in the former case and in the absence of deception, thus suggesting the existence of possible ecological validity issues in laboratory environments. Moreover, different cheating patterns emerge in different paradigms, with considerable differences in cheating amount for comparable shares

[1] In the 'Die under the cup' task, participants roll a die under a cup, report the outcome and receive payment according to the number they report without any effort linked to the performance. As participants are the only ones who see the rolls, they can cheat to increase payoffs.

Table 1
Descriptive Statistics of Real Performance, Reported Performance and Cheating Level across groups (N = 244). SE = Standard Error.

	Min.	Max.	Mean	SE
Real Performance	0	15	3.76	.182
Reported Performance	0	20	4.77	.211
Cheating Level	0	18	1.00	.154

of cheaters. In addition, publication bias may play a significant role in our understanding of the size and levels of cheating behaviours. Finally, as far as interventions as concerned, Hertwig and Mazar (2022) show that whereas a substantial amount of research has focused so far on the analysis of norm-based and priming interventions, less attention has been paid to architectural nudges, so that our understanding of the sensitivity of cheating behaviours to different intervention settings may be substantially affected by such differences in coverage.

In view of the previous remarks, it is of special importance to study the effect of loss frame and reward size on individual cheating behaviour in a context that may be thought of as a reasonable approximation of a real-world organizational setting. Given our focus, in our experiment, we chose to use an incentive scheme based on real effort. As in real organizational life, deciding whether to cheat and to what extent may be influenced by the fear of being considered unskilled after a bad performance. Even in the absence of cheating, bad performance can be due to time pressure, anxiety or many other factors (e.g. Kellogg et al., 1999), and this paves the way for convenient excuses to masque bad performance due to cheating as unfortunate failure despite goodwill. The issue is more serious if the organizational setting incentivizes this possibility: for instance, previous knowledge that performance will not be checked by the investigator can lead to cheating, because individuals are not motivated to perform well as they know that they can get away with a good enough reward by cheating afterwards. As a consequence, lack of monitoring can represent a sizeable source of financial loss in organizations. In addition, previous research has reported that dishonesty is higher in a performance-based, compared to a non-performance-based, cheating paradigm (Gravert, 2013), so a performance-based paradigm is the most critical one in which to study cheating with an organizational focus in mind. All things considered, therefore, an experiment on cheating in a performance-based paradigm that evokes a real organizational setting is of special interest in terms of its potential implications.

In the next section we introduce our experiment, which had the goal of testing whether individuals increase their propensity to, and the extent of, cheating when – all other things being equal – incentive schemes are framed as loss versus gain with larger versus smaller reward sizes, and in the physical absence versus presence of the reward. This experimental design, in our view, provides insight into various open issues that have not been investigated thoroughly enough in the literature, as discussed above.

3. Design & methods

We used a real effort task to implement a 2 (Frame: gain vs loss) × 2 (Reward size: large vs small) × 2 (Exposure: yes vs no) between-subjects experimental design. A total of 244 students (71% female, mean age = 22.6, SD = 2.9 years) were recruited through online public announcement disseminated during university courses. Recruited participants were randomly assigned to one of eight conditions (see Table 1). Sample size for ANOVA analysis with eight groups was determined via a priori power analysis (GPower*) with a medium effect size (= 0.25), $\alpha = 0.05$ and power = 0.90 which led to a suggested number of 231 participants. After providing written informed consent, participants completed a simple paper and pencil task, similar to the one proposed by Mazar et al. (2008), also known as the *matrix test*. The aim of the task was to solve in five minutes 20 simple addition problems. Each problem consisted of a matrix of 12 numbers and the participant had to find two numbers that added up to 10 (see Appendix A for the matrix test). After five minutes, participants received a second sheet (solution sheet) where they were asked to report how many matrices, out of 20, they had solved correctly. They were then asked to destroy the first sheet (task sheet) in a paper-shredder as a guarantee that their actual performance could not be later assessed by the experimenter.

Before starting the task, participants were told that they would receive a payment according to their performance as self-reported on the solution sheet, and that their real performance could not be verified in any way. However, every task sheet contained a false VAT number, which was different for every participant. The paper-shredder had previously been modified for the purposes of the study, so task sheets were not actually destroyed, and we were able to compare each participant's actual performance with what they had reported.

Participants in the 'small reward' condition were told that every solved matrix had a value of €0.10, with a payoff distribution of €0–2, while for participants in the 'large reward' condition every matrix had a value of €1, with a payoff distribution ranging from €0 (minimum) to €20 (maximum). As to the frame, the 'gain' and 'loss' conditions differed in that participants in the former were told that they would get a reward unit (€0.10 or €1 depending on the reward size treatment) for every solved matrix they reported at the end of the task. Participants in the loss treatment were told that the full available reward (€2 or €20) was prepared for them, but that at the end of the task a reward unit (€0.10 or €1 depending on the reward size treatment) would be taken away for every unsolved matrix they reported. These four conditions were repeated by adding money exposure. Participants in the 'exposure' condition were presented with a box containing the full available reward (€2 or €20) at the start of the task in addition to the verbal and written instructions and were asked to check the box contents before carrying out the task.

A preliminary test was used to select the two full rewards (€2 and €20) to ensure that they were actually perceived as a small versus large reward, respectively. A total of 38 independent participants (mean age= 23.2 SD = 1.8) completed a brief questionnaire about the reward size in which, using a 7-points Likert scale (1= extremely negative; 7= extremely positive), they were asked to assess how they would feel if they lost/gained €2 or €20. Results from the pre-test showed that while losing or gaining €2 was not perceived as relevant ($mean_L$= 3.4, $mean_G$= 3.6), losing or gaining €20 was considered significantly negative or positive, respectively ($mean_L$= 1.9, $mean_G$= 6.1). Because age can strongly influence the perceived value of money, participants' mean age in the preliminary test and in the study were matched.

In addition to the matrix test, participants in the study completed the Italian version of the following scales: South Oaks Gambling Screen (SOGS, Lesieur and Blume, 1987; Guerreschi and Gander, 2000) to check for pathological gambling, which could influence their cheating decision; the Barratt Impulsiveness Scale (BIS-11, Patton et al., 1995; Fossati et al., 2001) to assess the personality/behavioural construct of impulsiveness, which has been considered predictive of cheating (McTernan et al., 2014); and the General Decision-Making Styles (GDMS, Scott & Bruce, 1995; Gambetti et al., 2008) test to assess individual decision-making style. The BIS is a widely used measure of impulsiveness that includes 30 items (example item: " I say things without thinking ") scored to yield a total of six first-order factors (attention, motor, self-control, cognitive complexity, perseverance and cognitive instability impulsiveness) and three second-order factors (attentional, motor, and non-planning impulsiveness.). Cronbach's alpha for BIS-11 was 0.82. The GDMS is a 25-item scale (example item: "When I make decisions, I tend to rely on my intuition") designed to assess how individuals approach decision-making situations. It makes it possible to sort out five decision-making styles: a rational style, which emphasizes a logical evaluation of alternatives; an avoidant style, which emphasizes procrastinating and avoiding decisions; a dependant style, which emphasizes seeking advice from others; an intuitive style, which em-

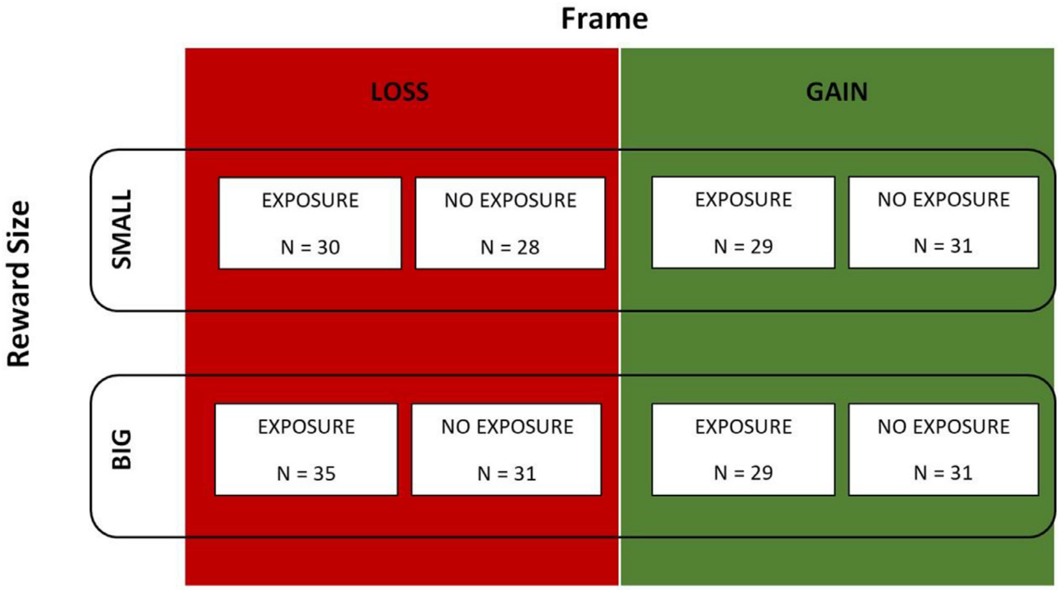

Fig. 1. Between Subjects Experimental Design (2 × 2 × 2).

Table 2
Fixed-Effects ANOVA results with real performance as criterion.

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	Partial η^2
Intercept	3451.53	1	3451.53	423.64	.000	
Exposure	1.72	1	1.72	.21	.645	.001
Frame	15.45	1	15.45	1.89	.170	.008
Size	2.02	1	2.02	2.49	.618	.001
Exposure x Frame	10.58	1	10.58	1.29	.256	.005
Exposure x Size	.31	1	.31	.03	.844	.000
Frame x Size	2.51	1	2.51	.30	.579	.001
Exposure x Frame x Size	2.18	1	2.18	.26	.605	.001
Error	1922.76	236	8.14			

phasizes reliance on personal feelings; and a spontaneous style, which emphasizes the desire to get through the decision-making process as soon as possible. Our sample reported a Cronbach's alpha = 0.87 for this scale.

4. Results

None of the 244 participants included in this study showed a risk for pathological gambling (all scored from 0 to 2 at SOGS), so they were all included in the final sample. Table 1 reports the descriptive statistics for real performance, reported performance and cheating level in the whole sample. Cheating level was obtained by subtracting the real performance score from the reported score. At the aggregate level, single sample *t*-test results showed a significant difference between reported performance (the one reported to obtain the reward) and the real score on the matrix test with participants reporting higher scores (M = 4.77, SD = 3.29), t (243) = 5.07, $p < 0.001$) than the real ones (M = 3.76, SD = 2.83). Moreover, a Pearson product-moment correlation coefficient was used to evaluate the association between individual real performance and cheating level. The results revealed a negative significant correlation between the two variables, ($r = -.219$, $n = 244$, $p = 0.001$). A slight negative correlation was also detected between real performance and spontaneous decision-making style as assessed by the GDMS questionnaire ($r = -.135$, $n = 244$, $p = 0.03$).

A three-way ANOVA was run on a sample of 244 participants to examine the effect of frame, reward size and money exposure on real performance. There was not significant three-way interaction, $F(1236) = 0.268$, $p = .605$ with participants performing quite similarly across conditions (see Table 2 for full ANOVA results).

The same analysis was carried out to test the influence of frame, size and money exposure on cheating level. The results again revealed there was no significant three-way interaction, $F(1236) = 0.854$, $p = 0.3565$, but revealed significance for all of the two-way interactions: frame by size $F(1236) = 5.14$, $p = 0.02$; size by exposure $F(1236) = 6.62$, $p = 0.01$; and exposure by frame $F(1236) = 16.78$, $p < 0.001$ (see Table 3 for full ANOVA results).

To further explore whether reward size and money exposure moderated the relationship between frame and cheating level, a moderation model was run using PROCESS (Hayes et al., 2013). PROCESS is an SPSS macro that allows mediation and moderation analysis. Within PROCESS, we selected model 2 (see Fig. 2) as representative of our hypothesized model, and we used a 1000 resamples bootstrap method with the confidence interval set to 95%. In the moderation model, the reward frame (loss, gain) was entered as the predictor (*X*), and the cheating level for the matrix task functioned as the outcome (*Y*). Reward size (large, small) and money exposure (yes, no) were added as moderators (W, Z).

The results indicated that the moderation model was significant with $F(5238) = 5.625$, $p < .001$, $R^2 = 0.106$ (see Table 4) and that, by introducing both the interaction terms (size × frame and exposure × frame), an increase in R^2 was registered ($R^2 = 0.086$).

Moreover the conditional effect of *X* (frame) on *Y* (cheating level) at different values of the moderators revealed significance in just two cases: when participants were exposed to the large reward, a loss frame predicted higher cheating (with $t = 3.82$; $p < .001$; 95% CI: LLCI = 0.934; ULCI = 2.92), and, on the contrary, when participants were not exposed to a small reward, a gain frame predicted higher cheating ($t = -3.71$; $p < 0.001$; 95% CI: LLCI = −2.94; ULCI = −.90). In other words, conditional effects of frame on cheating level are significant when participants are

Table 3
Fixed-Effects ANOVA results with cheating level as criterion.

Predictor	Sum of Squares	*df*	Mean Square	*F*	*p*	Partial η^2
Intercept	221.25	1	221.25	42.64	.000	
Exposure	.007	1	.007	.001	.970	.000
Frame	.000	1	.000	.000	.994	.000
Size	24.03	1	24.03	4.63	.032	.019
Exposure x Frame	87.07	1	87.07	16.78	.000	.066
Exposure x Size	34.38	1	34.38	6.62	.011	.027
Frame x Size	26.70	1	26.70	5.14	.024	.021
Exposure x Frame x Size	4.43	1	4.43	.854	.356	.004
Error	1224.50	236	5.18			

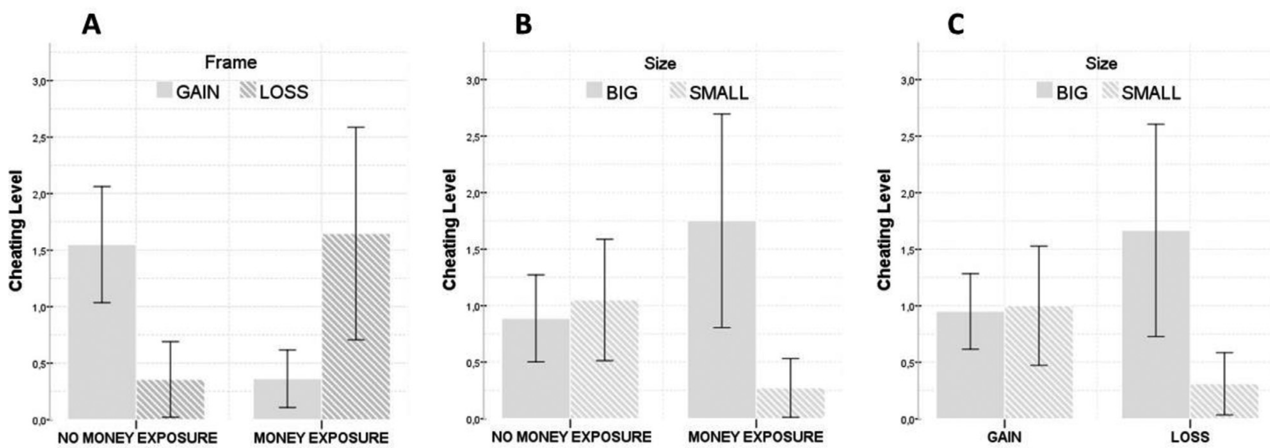

Fig. 2. (A) Interaction effect Exposure x Frame; (B) Interaction effect Exposure x Size; (C) Interaction effect Frame by Size on Cheating Level.

not exposed to small reward and when they are exposed to big ones (all conditional effects in Table 5).

5. Discussion and conclusion

Our experimental design replicated several characteristics of real-life organizational environments. Participants were asked to carry out a task with a clear criterion for evaluation of success/failure but subject to a significant level of discretion in reporting. They had to report their performance and were therefore potentially exposed to the judgement of a principal, with the ensuing psychological incentives. They were exposed to various levels of reward, under different frames, as is typical of complex organizations with a rich range of situational change. Participants were also sometimes physically exposed to the reward, in both high and low stakes conditions, whereas in other situations no direct exposure was given. Overall, this was a complex, varied experiential setting in which participants were called upon to recruit many different behavioural schemes and to assess subtle trade-offs mixing cognitive, affective and moral elements. By collecting participant level data, we found that real performance and cheating levels are related. In particular, the effects of framing on cheating levels were dependant on reward size, as well as on exposure. Whereas an influence of loss aversion on cheating behaviour was detected when participants were exposed to large rewards, the opposite was true when participants were not exposed to small rewards, with higher levels of cheating found in the gain condition compared to the loss condition. As reported in the previous section, results from three-way ANOVA showed that real performance was not influenced either by the frame, the reward size or money exposure, because participants showed quite similar performances in all the conditions. Moreover, our results did not support the idea that better performers feel more entitled to cheat, because actual performance and cheating level were negatively related so that, as performance increased, cheating level decreased. This result is partially in contrast with findings from a paper showing that the best performers in a game display a higher tendency to engage in unrelated dishonest behaviour subsequently (Schurr and Ritov, 2016). Our task differed from that used in the latter paper, as our task was not designed to be a competition, and the adoption of dishonest behaviour (i.e. cheating) was directly related to individual task performance. In this sense, the negative association between real performance and cheating level could be due to two possible factors: either participants who actually scored high on the matrix test had a smaller 'cheating space' (i.e. they could choose within a narrower range of cheating levels) compared to participants with lower actual scores, or there could be a kind of 'skill-related social desirability' that led participants who scored low on the matrix test to be more motivated to cheat because of the fear of being considered unskilled or below average.

Another interesting result concerned the negative association between cheating and a spontaneous decision-making style. More specifically, cheating level was negatively associated with a decision-making style focused on the need for immediacy. This result, in connection with the non-significant correlation between cheating and impulsiveness, supports the idea that the decision to engage in dishonest behaviour recruits several higher-order evaluation processes rather than being a mere consequence of lack of impulse control.

At the aggregate level, results from three-way ANOVA and moderation model only partially replicated previous findings (Grolleau et al., 2016), but did not completely support the hypothesis of a loss aversion effect on cheating, rather suggesting that the relationship between framing and cheating behaviour can be moderated by other variables such as reward size and exposure to the reward. More specifically, according to our findings, a loss frame (compared to a gain frame) seemed to increase cheating when participants were told about – and exposed to – a large reward, whereas the gain frame (compared to the loss frame) increased cheating when participants were just told about a small reward. All other combinations produced no effect on cheating. In other words, participants were willing to cheat solely in two situations: under the prospect of a large loss of money they were physically exposed to in advance, and when promised a small gain of money that they were not physically exposed to beforehand.

This inverted effect is, in part, not surprising if we consider contributions that call for a reconsideration of the idea that losses always loom larger than gains (e.g. Gal and Rucker, 2018; Higgins and Liberman, 2018). More specifically, Gal and Rucker (2018), after reviewing several studies, concluded that findings do not support a 'strong' form of loss aversion such that losses always have a stronger psychological impact than gains, but a 'weak' one – that is to say, depending on the context, it is possible for gains to be more impactful than losses. Higgins and Liberman (2018) added that, although loss aversion is not strongly confirmed by the results, the role of reference points in increasing people's sensitivity to changes in reward is supported by the existing literature on counterfactual thought or goal pursuit, and that individual characteristics (e.g. higher sensitivity to negative than positive outcomes and vice versa), as well as context, should be considered when investigating the effect of loss/gain frames on behaviour. It is also possible that people may tend to use more than one reference point at a time.

As to the effects of reward size, our results on the levels of cheating supported findings such as those of Mukherjee et al. (2017), who found that when stakes are low, participants rate gain as more psychological impactful than loss, whereas, with higher stakes, loss is rated to have a stronger impact than gain. Moreover, they show that, if a larger anchor is provided, the loss aversion effect vanishes even for high stakes. The same reversed pattern has been reported in another previous work (Harinck et al., 2007), in which the authors explained their results on the basis of a 'hedonic principle' (a classical Benthamian framework in which people seek to maximize pleasure and avoid pain) and on the assumption that the ease with which participants apply cognitive discounting depends on reward magnitude. Nevertheless, our results can be interpreted as the consequence of negative emotional involvement (e.g., guilt) in the cheating evaluation process (e.g. Battigalli et al., 2013). In this view, when people are physically exposed to the reward, the psychological impact of giving up a large amount is stronger than the psychological impact of guilt aversion, while when people are not physically exposed to the reward, the psychological impact of getting a small reward by cheating elicits lower levels of guilt ('This is not real cheating'), whereas it is acceptable to bear a small cost (i.e. accept giving up a small reward) to feel not guilty.

The results of our study revealed that different combinations of frame, reward size and exposure have different effects on cheating behaviour, although the limit of using a between-subjects instead of a within-subject design does not allow verification of the effect of different conditions at the individual level. Future research should address this issue. As a general point, we find that the effects of the loss frame on cheating behaviours tend to be more complex and nuanced than predicted by PT. Furthermore, as it has been shown that the value function in PT is dependant on magnitudes and that including a higher anchor can neutralize the loss aversion effect, future studies should examine whether the introduction of another reference point can prevent or reduce cheating. Future studies should also investigate the role of risk-taking propensity and sensation-seeking traits (e.g. Zimerman et al., 2014), as a stronger tendency to be involved in risky activities could function as a predictor of cheating behaviour. Likewise, it would be interesting to investigate how the joint effects of framing and default (Giuliani et al., 2022) may influence cheating. Also, future research should better consider the role of sensitivity to guilt in modulating cheating decisions not just across different frames, but also across different levels of exposure to the rewards, as people are becoming increasingly used to electronic payments so that most economic transactions are already carried out without the physical presence of money. Moreover, the role of other social emotions such as shame, anger or (social) anxiety should be better investigated as to their relationship with cheating behaviours.

The main theoretical implications of our study largely agree with those of recent meta-analyses of the literature such as Gerlach et al. (2019). Although cheating behaviours are sensitive to a significant extent to well-studied factors such as the loss frame, reward size, or money exposure, the evidence suggests that such relations are more complex and context-dependant than previously thought, and considerably more research is needed to elucidate them in a systematic way. Our study contributes to indicating some of the most interesting and promising directions of future research in such a spirit, in particular in terms of joint effects of several factors in settings with stronger ecological validity than traditional experimental ones (Table 4).

Our study entailed a deception of the experimental subjects, and while it would be ideal to design experiments in which no deception is involved, in the case of studying cheating at the individual level it is

Table 4
Moderation Model. Se = standard error. LLCI = Lower level confidence interval. ULCI = Upper level confidence interval. Significant effects in bold.

	B	se	t	*p*	LLCI	ULCI
constant	4.26	2.03	2.09	.037	.24	8.27
Frame	−1.60	1.28	−1.24	.214	−4.13	.93
Exposure	−3.64	.93	−3.88	**.000**	−5.49	−1.79
Frame x Exposure	2.45	.59	4.16	**.000**	1.29	3.62
Size	1.43	.93	1.53	.126	−0.40	3.28
Frame x Size	1.38	.59	−2.35	**.019**	−2.55	−0.22

Table 5
Conditional effects of Frame on Cheating at values of the moderators (Exposure and Size). Significant effects in bold.

Exposure	Size	Effect	se	t	*p*	LLCI	ULCI
No	Big	−0.53	.50	−1.04	.269	−1.53	.47
No	Small	−1.92	.51	−3.71	**.000**	−2.94	−0.90
Yes	Big	−1.93	.50	3.82	**.000**	.93	2.92
Yes	Small	.54	.51	1.03	.299	−0.48	1.55

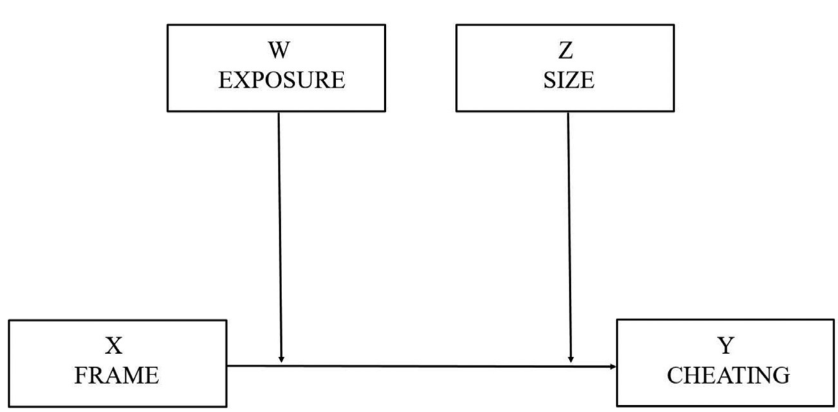

Fig. 3. Moderation Model. Size (W) and Money Exposure (Z) Moderate the Relationship Between Frame and Cheating Level.

difficult to conceive of meaningful settings in which no deception occurs. However, this is a limitation of our study that should be taken into account. Another important limitation relaters to the fact that, although our experimental design has been carefully carried out to reproduce realistic organizational conditions as much as possible, the laboratory setting suffers, as discussed above, from potential issues of ecological validity that can only be partially accounted for. An interesting alternative, with all the implied corresponding limitations, is that of field or natural experiments where individual data become available, but again, in the case of cheating, it is not simple to reliably measure individual or aggregate levels of cheating except through some form of data leakage, which is not less ethically questionable than the deception of experimental subjects. Developing new experimental designs that avoid these problems is, in turn, a very challenging and interesting avenue for future research (Figs. 1, 3).

Data availability

Data will be made available in a public repository at the time of publication and will be available upon request before publication.

Declaration of Competing Interest

The authors declare no competing interest

Data availability

Data will be made available on request.

Appendix A. Matrices used in the test

1

3.91	0.82	3.74
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

2

1.69	1.82	2.91
4.67	4.81	3.05
5.82	5.06	4.28
6.36	5.19	4.57

3

5.87	2.13	6.64
6.79	3.44	4.07
4.23	1.68	3.32
3.21	2.48	7.13

4

0.89	5.66	7.61
4.32	2.28	3.78
7.79	5.41	4.56
2.37	7.71	2.21

5

0.41	2.06	7.43
2.68	9.43	0.56
7.96	0.53	2.58
9.47	7.31	9.56

6

2.32	6.97	7.71
4.02	3.12	2.22
6.89	7.66	5.89
5.98	3.02	4.21

7

7.74	9.98	1.83
7.87	1.63	2.24
8.37	2.14	7.68
1.24	0.12	8.27

8

4.15	6.95	3.75
6.35	3.72	6.65
3.25	5.85	7.18
4.35	3.05	5.75

9

2.09	4.13	2.73
6.38	3.71	7.91
7.29	5.77	3.61
5.21	4.69	5.89

10

3.08	8.84	1.14
2.66	3.68	2.54
1.12	7.36	6.42
7.44	6.22	8.86

11

6.53	3.32	4.57
3.97	5.41	6.67
3.17	4.52	3.07
6.02	6.83	5.47

12

5.73	2.18	4.27
5.02	4.88	7.76
2.03	7.81	5.93
4.17	2.26	7.87

13

4.45	5.65	8.74
1.16	6.14	2.16
3.96	4.15	1.96
5.75	8.04	5.94

14

0.77	9.07	2.67
2.93	8.57	1.08
7.32	8.93	0.43
0.93	7.09	9.13

15

5.62	4.92	7.22
5.32	2.68	7.08
2.14	2.82	5.08
4.58	7.76	4.28

16

7.85	6.35	1.55
2.25	8.45	8.15
3.05	2.05	7.65
8.05	1.75	3.55

17

3.33	2.04	3.23
6.23	6.17	6.87
2.13	3.93	7.67
6.67	7.43	3.67

18

7.87	4.86	2.15
5.14	2.23	4.16
2.17	7.12	5.76
5.74	4.14	7.95

19

7.43	3.78	7.86
2.47	2.86	2.98
6.42	7.02	8.18
2.16	1.72	7.13

20

6.91	2.19	4.29
3.71	5.61	2.67
5.43	7.61	7.23
3.19	6.29	4.59

References

Abeler, J., Becker, A., Falk, A., 2014. Representative evidence on lying costs. J. Public Econ. 113, 96–104.
Abeler, J., Nosenzo, D., Raymond, C., 2019. Preferences for truth-telling. Econometrica 87 (4), 1115–1153.
Ariely, D., 2012. The (honest) Truth About dishonesty: How We Lie to Everyone –Especially Ourselves. HarperCollins.
Battigalli, P., Dufwenberg, M., 2007. Guilt in games. Am. Econ. Rev. 97 (2), 170–176.
Battigalli, P., Dufwenberg, M., 2009. Dynamic psychological games. J. Econ. Theory 144 (1), 1–35.
Battigalli, P., Charness, G., Dufwenberg, M., 2013. Deception: the role of guilt. J. Econ. Behav. Organ. 93, 227–232.
Becker, G.S., 1968. Crime and punishment: an economic approach. In: Fielding, N.G., Clarke, A., Witt, R. (Eds.), The Economic Dimensions of Crime. Palgrave Macmillan, pp. 13–68.
Blanco, C., Ezquerra, L., Rodriguez-Lara, I., 2015. Incentives to Cheat Under Loss Aversion. Mimeo.
Bogliacino, F., Montealegre, F., 2020. Do negative economic shocks affect cognitive function, adherence to social norms and loss aversion? J. Econ. Sci. Assoc. 6, 57–67.
Boles, T.L., Croson, R.T., Murnighan, J.K., 2000. Deception and retribution in repeated ultimatum bargaining. Organ. Behav. Hum. Decis. Process. 83 (2), 235–259.
Boyce, C.J., Wood, A.M., Banks, J., Clark, A.E., Brown, G.D., 2013. Money, wellbeing, and loss aversion: does an income loss have a greater effect on well-being than an equivalent income gain? Psychol. Sci. 24 (12), 2557–2562.
Cameron, J.S., Miller, D.T., 2009. Different ethical standards in gain versus loss frames. In: de Cremer, D. (Ed.), Psychological Perspectives on Ethical Behavior and Decision Making. Information Age Publishing, pp. 91–106.
Canessa, N., Crespi, C., Motterlini, M., Baud-Bovy, G., Chierchia, G., Pantaleo, G., Tettamanti, M., Cappa, S.F., 2013. The functional and structural neural basis of individual differences in loss aversion. J. Neurosci. 33 (36), 14307–14317.
Cappelen, A.W., Konow, J., Sørensen, E.Ø., Tungodden, B., 2013. Just luck: an experimental study of risk-taking and fairness. Am. Econ. Rev. 103 (4), 1398–1413.
Charness, G., Dufwenberg, M., 2006. Promises and partnership. Econometrica 74 (6), 1579–1601.
Chib, V.S., De Martino, B., Shimojo, S., O'Doherty, J.P, 2012. Neural mechanisms underlying paradoxical performance for monetary incentives are driven by loss aversion. Neuron 74 (3), 582–594.
Clot, S., Grolleau, G., Ibanez, L., 2014. Smug alert! Exploring self-licensing behavior in a cheating game. Econ. Lett. 123 (2), 191–194.
Conrads, J., Ellenberger, M., Irlenbusch, B., Ohms, E.N., Rilke, R.M., Walkowitz, G., 2017. Team Goal Incentives and Individual Lying Behavior. Otto Beirsheim School of Management (WHU Working Paper 17/02).
Dimant, E., van Kleef, G.A., Shalvi, S., 2020. Requiem for a Nudge: framing effectsd in nudging honesty. J. Econ. Behav. Org. 172, 247–266.
Dimant, E., Shalvi, S., 2022. Meta-nudging honesty: past, present and future of the research frontier. Curr. Opin. Psychol. 47, 101426.
Ezquerra, L., Kolev, G.I., Rodriguez-Lara, I., 2018. Gender differences in cheating: loss vs. gain framing. Econ. Lett. 163, 46–49.
Fischbacher, U., Föllmi-Heusi, F., 2013. Lies in disguise—an experimental study on cheating. J. Eur. Econ. Assoc. 11 (3), 525–547.
Fossati, A., Di Ceglie, A., Acquarini, E., Barratt, E.S., 2001. Psychometric properties of an Italian version of the Barratt Impulsiveness Scale-11 (BIS-11) in nonclinical subjects. J. Clin. Psychol. 57 (6), 815–828.
Friesen, L., Gangadharan, L., 2012. Individual level evidence of dishonesty and the gender effect. Econ. Lett. 117 (3), 624–626.
Gal, D., Rucker, D.D., 2018. The loss of loss aversion: will it loom larger than its gain? J. Consum. Psychol. 28 (3), 497–513.
Gambetti, E., Fabbri, M., Bensi, L., Tonetti, L., 2008. A contribution to the Italian validation of the general decision-making style inventory. Pers. Individ. Dif. 44 (4), 842–852.
Garbarino, E., Slonim, R., Villeval, M.C., 2017. Loss Aversion and Lying Behavior: Theory, Estimation and Empirical Evidence. CNRS Lyon-Saint Etienne (GATE Working Paper 1631).
Garbarino, E., Slonim, R., Villeval, M.C., 2019. Loss Aversion and lying behavior. J. Econ. Behav. Organ. 158, 379–393.
Gerlach, P., Teodorescu, K., Hertwig, R., 2019. The truth about lies: a meta-analysis on dishonest behavior. Psychol. Bull. 145 (1), 1–44.
Gino, F., Gu, J., Zhong, C.B., 2009. Contagion or restitution? When bad apples can motivate ethical behavior. J. Exp. Soc. Psychol. 45 (6), 1299–1302.
Gino, F., Ayal, S., Ariely, D., 2013. Self-serving altruism? The lure of unethical actions that benefit others. J. Econ. Behav. Organ. 93, 285–292.
Giuliani, F., Cannito, L., Gigliotti, G., Rosa, A., Pietroni, D., Palumbo, R., 2022. The joint effect of framing and defaults on choice behavior. Psychol. Res..
Gneezy, U., 2005. Deception: the role of consequences. Am. Econ. Rev. 95 (1), 384–394.
Gneezy, U., Rockenbach, B., Serra-Garcia, M., 2013. Measuring lying aversion. J. Econ. Behav. Organ. 93, 293–300.
Gravert, C., 2013. How luck and performance affect stealing. J. Econ. Behav. Organ. 93, 301–304.
Grolleau, G., Kocher, M.G., Sutan, A., 2016. Cheating and loss aversion: do people cheat more to avoid a loss? Manage Sci. 62 (12), 3428–3438.
Guerreschi, C., & Gander, S. (2000). Versione Italiana del South Oaks Gambling Screen (SOGS) di HR Lesieur e SB Blume. Giocati dal gioco. Quando il divertimento diventa una malattia: il gioco d'azzardo patologico Milano: San Paolo, 137–142.
Harinck, F., Van Dijk, E., Van Beest, I., Mersmann, P., 2007. When gains loom larger than losses: reversed loss aversion for small amounts of money. Psychol. Sci. 18 (12), 1099–1105.
Hayes, A.F. (2013). The PROCESS macro for SPSS and SAS (version 2.13).
Hertwig, R., Mazar, N., 2022. Toward a taxonomy and review of honesty interventions. Curr. Opin. Psychol. 47, 101410.
Higgins, E.T., Liberman, N., 2018. The loss of loss aversion: paying attention to reference points. J. Consum. Psychol. 28 (3), 523–532.
Hilbig, B.E., Thielmann, I., 2017. Does everyone have a price? On the role of payoff magnitude for ethical decision making. Cognition 163, 15–25.
Houser, D., Vetter, S., Winter, J., 2012. Fairness and cheating. Eur. Econ. Rev. 56 (8), 1645–1655.
Huynh, T.L.D., 2020. Replication: cheating, loss aversion and moral attitudes in Vietnam. J. Econ. Psychol. 78, 102277.
Kahneman, D., Tversky, A., 1979. Prospect theory: an analysis of decisions under risk. Econometrica 47 (2), 263–292.
Kahneman, D., Knetsch, J.L., Thaler, R.H., 1991. Anomalies: the endowment effect, loss aversion, and status quo bias. J. Econ. Perspect. 5 (1), 193–206.
Kaushik, M., Singh, V., Chakravarty, S., 2022. Experimental evidence of the effect of financial incentives and detection on dishonesty. Sci. Rep. 12, 2680.
Kellogg, J.S., Hopko, D.R., Ashcraft, M.H., 1999. The effects of time pressure on arithmetic performance. J. Anxiety Disord. 13 (6), 591–600.
Kim, K.H., Guinote, A., 2022. Cheating to win or not to lose: power and situational framing affect unethical behavior. J. Appl. Soc. Psychol. 52 (3), 137–144.
Kouchaki, M., Smith-Crowe, K., Brief, A.P., Sousa, C., 2013. Seeing green: mere exposure to money triggers a business decision frame and unethical outcomes. Organ. Behav. Hum. Decis. Process. 121 (1), 53–61.
Lesieur, H.R., Blume, S.B., 1987. The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. Am. J. Psychiatry.
Lundquist, T., Ellingsen, T., Gribbe, E., Johannesson, M., 2009. The aversion to lying. J. Econ. Behav. Organ. 70 (1–2), 81–92.
Markiewicz, L., Gawryluk, K., 2020. Cheating among children: temptation, loss framing, and previous cheating. J. Behav. Decis. Mak. 33 (2), 151–165.
Mazar, N., Amir, O., Ariely, D., 2008. The dishonesty of honest people: a theory of self–concept maintenance. J. Mark. Res. 45 (6), 633–644.
McTernan, M., Love, P., Rettinger, D., 2014. The influence of personality on the decision to cheat. Ethics Behav. 24 (1), 53–72.
Muehlheusser, G., Roider, A., Wallmeier, N., 2015. Gender differences in honesty: groups versus individuals. Econ. Lett. 128, 25–29.
Mukherjee, S., Sahay, A., Pammi, V.C., Srinivasan, N., 2017. Is loss-aversion magnitude-dependent? Measuring prospective affective judgments regarding gains and losses. Judgm. Decis. Mak. 12 (1), 81–89.
Nagel, J.A., Patel, K.R., Rothstein, E.G., Watts, L.L., 2021. Unintended consequences of performance incentives: impacts of framing and structure on performance and cheating. Ethics Behav. 31 (7), 498–515.
Patton, J., Stanford, M., 1995. Barratt impulsiveness scale, version 11 [BIS 11]. In: Schutte, N.S., Malouff, J.M. (Eds.), Sourcebook of Adult Assessment Strategies. Plenum Press, pp. 361–364.
Petrishcheva, V., Riener, G., Schildberg-Hörisch, H., 2022. Loss aversion in social image concerns. Exp. Econ..
Rowatt, W.C., Cunninghan, M.R., Druen, P.B., 1998. Deception to get a date. Personal. Soc. Psychol. Bull. 24 (11), 1228–1242.
Sarzyńska, J., Falkiewicz, M., Riegel, M., Babula, J., Margulies, D.S., Nęcka, E., Grabowska, A., Szatkowska, I., 2017. More intelligent extraverts are more likely to deceive. PLoS One 12 (4), e0176591.
Schindler, S., Pfattheicher, S., 2017. The frame of the game: loss-framing increases dishonest behavior. J. Exp. Soc. Psychol. 69, 172–177.
Schurr, A., Ritov, I., 2016. Winning a competition predicts dishonest behavior. Proc. Natl. Acad. Sci. 113 (7), 1754–1759.
Shah, J., Higgins, T., Friedman, R.S., 1998. Performance incentives and means: how regulatory focus influences goal attainment. J. Pers. Soc. Psychol. 74 (2), 285–293.
Shalvi, S., Dana, J., Handgraaf, M.J., De Dreu, C.K., 2011. Justified ethicality: observing desired counterfactuals modifies ethical perceptions and behavior. Organ. Behav. Hum. Decis. Process. 115 (2), 181–190.
Shen, Q., Teo, M., Winter, E., Hart, E., Chew, S.H., Ebstein, R.P., 2016. To cheat or not to cheat: tryptophan hydroxylase 2 snp variants contribute to dishonest behavior. Front. Behav. Neurosci. 10, 82.
Sutter, M., 2009. Deception through telling the truth?! Experimental evidence from individuals and teams. Econ. J. 119 (534), 47–60.

Tversky, A., Kahneman, D., 1981. The framing of decisions and the psychology of choice. Science 211 (4481), 453–458.
Von Neumann, J., Morgenstern, O., 1944. Theory of Games and Economic Behavior. Princeton University Press.
Wang, L., Murnighan, J.K., 2016. How much does honesty cost? Small bonuses can motivate ethical behavior. Manage Sci. 63 (9), 2903–2914.
Wiltermuth, S.S., 2011. Cheating more when the spoils are split. Organ. Behav. Hum. Decis. Process. 115 (2), 157–168.