GATE LYON SAINT-ÉTIENNE
UMR 5824

93, chemin des Mouilles
69130 Ecully - France

Maison de l'Université, Bâtiment B
10, rue Tréfilerie
42023 Saint-Etienne cedex 02 - France

http://www.gate.cnrs.fr
gate@gate.cnrs.fr

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Risk taking with unethical money: An experimental study

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Keywords:
Risk taking, fungibility, psychological cost, dishonesty, experiment

JEL codes:
C9, D01, D81

Working Paper

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Sorravich Kingsuwankul† Marie Claire Villeval‡

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†Univ Lyon, Université Lumière Lyon 2, GATE UMR 5824. 93, Chemin des Mouilles, F-69130 Ecully, France. Email: kingsuwankul@gate.cnrs.fr.

‡Univ Lyon, CNRS, GATE UMR 5824. 93, Chemin des Mouilles, F-69130 Ecully, France. IZA, Bonn, Germany. Email: villeval@gate.cnrs.fr

1 Introduction

The reputation of the financial sector in the recent decade has been tarnished by the prevalence of banking scandals and frauds revealing a lack of ethical standards and excessive risk taking with client's money (Guiso et al., 2008; Sapienza and Zingales, 2012; Kantšukov and Medvedskaja, 2013). According to a study by Egan et al. (2018), approximately 7% of financial advisors in the US between 2005 and 2015 have misconduct records, and this goes up to 15% in some large financial firms. While some studies showed how individuals tend to take more risk when making decision on behalf of others (Andersson et al., 2014; Füllbrunn and Luhan, 2017; Vieider et al., 2016), there might be another phenomenon - people may take more risk when the money has been earned unethically. We define unethical money as the undeserved monetary gain that the individual obtains through the use of deception. It is particularly important to investigate this phenomenon for two reasons. First, unethical money is not uncommon. One may think of how fraudulent financial advisors can gain unethically by lying to their customers (Tergiman and Villeval, 2019), kleptocrats can embezzle funds (Abbink et al., 2002), while under-regulated enterprises can cheat from their customers (Vranka et al., 2019). Due to the hidden nature of such a gain, it is nearly impossible to observe how people use it, and whether or not it is used differently from the money earned ethically. Second, we study such phenomenon in the context of risk taking because its negative outcome results in a financial loss. One may think of investing behavior for an example. If the unethical nature of money can boost fraudulent investors' willingness to take risk, this phenomena can be detrimental to the investment market due to lack of prudence and a tendency for risk.

In this study, we aim to investigate if individuals make different risky decisions when the bad outcome of risk taking can reduce the money previously earned unethically or ethically through luck or effort. The principle of economic fungibility (Abeler and Marklein, 2017) posits that any unit of money is substitutable. This implies that individual's consumption decision should only be influenced by the total wealth, and not by its composition. This, however, has been refuted by studies in mental accounting (Thaler, 1985, 1999), which showed that the source of income can influence how money is spent. This encompasses the notion of labels associated with the money (i.e., a bonus, a grant or a subsidy) and how it has been earned (i.e., through effort or luck, honestly or dishonestly). In fact, a recent study by Imas et al. (2020) explored the violation of fungibility of unethical money in the context of charitable donation. We differ from Imas et al. (2020) in that we investigate such a violation in the context of risk taking. Imas et al. (2020) proposed the notion of mental money laundering which is engaged by dishonest individuals to dissociate unethical money from its source, and thereby changes the propensity to use that money. This is, however, not a focus of our study as their mechanism rests on the physical exchange of cash for the same amount from an arbitrary clean source. Even though money laundering exposes the unethical money to some levels of risk, its objective is to clean the money. We differ here in that we are interested in *how much* risk individuals are willing to take with dishonestly earned money and whether or not it differs from when it was earned honestly through luck and effort.

Studies have shown that individuals tend use money earned through effort differently from a windfall money (i.e., Hoffman et al., 1994; Cherry et al., 2002; List and Cherry, 2008; Hvide et al., 2019). This can be explained by a sense of legitimacy because effort provision enhances the sense of entitlement. In the context of risk taking, a sense of entitlement should induce risk aversion. Obtaining a windfall gain through luck imparts a weaker sense of entitlement which then induces risk taking. How a person might take risk with unethical money is not so straightforward, for two reasons. On the one hand, such a gain is earned by deceiving other people. Thus, in principle, unethical money should not lead to a feeling of entitlement as it belongs to others. This could mean that the person can perceive unethical money as a windfall gain which, thereby, induces risk taking. On the other hand, a dishonest person may incur a psychological cost of lying to obtain the unethical money (Gneezy et al., 2018; Abeler et al., 2019). The existence of a psychological cost *could* act like an effort cost which then induces risk aversion. Simply put, dishonest individuals may feel a sense of entitlement for the unethical gain and thus behave *as if* they were actually entitled to it.

For example, Thielmann and Hilbig (2019) argued that even though a dishonest individual is not *objectively* entitled to an unethical gain, he may justify *subjectively* that it is 'his' because he incurred a psychological cost to obtain it. Using a dictator game, Thielmann and Hilbig (2019) found no significant difference in the willingness to share between dictators who lied to obtain the money and those who earned it through effort. They interpreted their finding such that the presence of a psychological cost engenders a sense of entitlement for the payoff such as in the case of effort provision. It might then be the case that the presence of a psychological cost also induces less risk taking as people justified their entitlement to the unethical gain. Therefore, while people might take more risk with unethical money because it is not fundamentally their money, it is plausible to observe risk averse behavior, as in the case of earned money, if dishonest people justify the entitlement with the psychological cost of lying.

We designed an experiment where participants, first, earned money and, then, made a risk taking decision whose bad outcome would reduce the earning initially realized. We have three treatments in a between-subject design that varied in *how* the participants earned the money before their risk taking decision. In the Lying treatment, participants could lie to obtain money in a truth-telling mini-game of Gibson et al. (2013). In the Effort treatment, participants performed a real-effort task to obtain the money. In the Windfall treatment, participants did not perform any task but earned the money through luck in a binary lottery. After the earning stage, participants made decision in the risk task. We adapted the Bomb Risk Elicitation Task (BRET) introduced by Crosetto and Filippin (2013) in the loss domain, whereby in the event of bad outcome participants would lose a part of the earnings in the initial stage of the experiment. As for our conjectures, if the psychological cost of lying generates a sense of entitlement, as posited by Thielmann and Hilbig (2019), there should be no difference in the risk taking between individuals whose earnings were earned through lying and those whose earnings were earned through effort, as both groups would exhibit a sense of entitlement. Along this line, we then conjecture that individuals whose earnings were earned unethically should exhibit lower risk taking than those whose earnings were earned through luck, as the former would exhibit a sense of entitlement but not by the latter.

Contrary to our conjectures, we found that dishonest individuals who earned money at a moral cost of lying took more risk in the BRET than those who earned the same ethically though effort. In addition, we found no significant difference in risk taking between individuals who earned money by lying or luck. Our results imply that dishonest individuals treated unethical gain more like a windfall gain than hard-earned money. The structural estimation reveals that how individuals earned money affected the loss aversion parameter. Dishonest individuals and those who earned money through luck were less loss averse compared to those who earned the same through effort. Our interpretation is that dishonest individuals who earned money from lying might have perceived it as 'easy money' and therefore might care to a lesser degree when it was at stake. Lastly, we explored the data and found that the increased risk taking with unethical money came from individuals who were relatively risk averse at baseline, while the increase in risk taking with windfall money came from those who were relatively risk loving at baseline. Our findings highlight the important impact of the unethical nature of money on risk taking decision, which is especially relevant in the financial industry where fraud is not uncommon, combined with the incentives and decision-making environment that already encourage risk taking behavior.

The remainder of the article is organized as follows. Section 2 reviews the related literature. Sections 3 and 4 outline the design and the behavioral conjectures. Section 5 reports the findings. Section 6 discusses the findings and concludes.

2 Related literature

Our study contributes to three strands of literature namely, the fungibility of money, contingency of risk attitudes, and the spillover effects of dishonesty on future decisions

The violation of fungibility is corroborated by evidence from both field (see Beatty et al., 2014; Kooreman, 2000; Hastings and Shapiro, 2013, 2018) and lab experiments. In particular, Abeler and Marklein (2017) observed the spending behavior of restaurant customers by giving them a coupon either earmarked for beverages or unlabeled (i.e., could be spent on both food and beverages). They found that customers receiving a coupon earmarked for beverages spent more on beverages than their counterparts who received an unlabeled one. Their finding was replicated with students in a laboratory setting - labeling a grant significantly increased the spending on the targeted commodity compared to when it was not labeled. Other works have examined the endowment effect in economic games. Hoffman et al. (1994) found that by allowing subjects to earn the right to be the proposer and dictator in the ultimatum and dictator games respectively, subjects significantly reduced the allocation decisions for their counterparts as they perceived to have earned the rightful entitlement of the endowment. Cherry et al. (2002) found that by introducing a pre-game stage where subjects earned an endowment, and then made an allocation decision in the dictator game, the proportion of zero offers significantly increased to 95%, compared to 19% when the endowment was a windfall money. A similar finding was found in Cherry (2001), Oxoby and Spraggon (2008), and List and Cherry (2008), but not by Clark (2002) and Cherry et al. (2005) in the context of a public good game. Regardless, the fact that an endowment has to be earned may create a sense of entitlement (or legitimacy) for the endowment compared to when it is a windfall money granted by the experimenter. This difference in the sense of entitlement then affects how subjects make decisions with regards to the endowment.

There are studies that investigated how people perceive money earned from an unethical source and how the unethical nature affects its latter use. A psychology study by Tasimi and Gelman (2017) found that compared to money earned from a clean source, individuals find morally tainted money less desirable, are less likely to spend it on themselves, and prefer to donate it to a charity. The latter result is in line with Gneezy et al. (2014) who found that subjects who lied in the deception game were more likely to donate money to a charity. Closely related to ours is Imas et al. (2020) who explored the tendency of dishonest individuals to engage in motivated mental money laundering. Their mechanism of mental money laundering requires that the money earned unethically *'is physically exchanged for the same amount but from a different arbitrary source'*. In their main experiment, participants first played a Sender-Receiver game. After that, depending on the treatments, senders entered a lottery stage where they wired the money earned previously in a lottery. The lottery returned the same amount of money with 83%, while the amount was doubled or lost with a small probability of 8.3% each. The procedure in the lottery stage was varied to allow dishonest senders to engage in mental money laundering. In the laundered condition, the money wired through the lottery was replaced with *physically different bills* from an arbitrary clean source, while in the unlaundered condition, there was no such physical exchange. After the lottery stage, senders participated in a donation game. Imas et al. (2020) found that dishonest senders who exchanged the bills donated significantly less compared to those who did not enter the lottery. There was, however, no difference in the donation of those who did not enter the lottery stage and those who did not exchange the bills. They interpreted their finding in support of mental money laundering which violated the principle of fungibility. In an additional experiment, Imas et al. (2020) found that when allowed to choose the amount of money to be wired in the lottery, dishonest senders whose bills would be exchanged put significantly more at stake compared to those whose bills would not be exchanged. They interpreted this finding that people were aware of the motivation to launder unethical money, and thereby exploited the opportunity, even at some risks of losing it. We differ from Imas et al. (2020) in two major aspects. First, we study risk taking behavior which is not related to the moral domain, while Imas et al. (2020) studied charitable giving, which is directly related to the moral domain. Second, our risk task is very different from the one used in Imas et al. (2020). Their lottery was designed to launder money (i.e., high chance of equal return with minimal chances of doubling or losing). On the other hand, in our risk task participants decide *how much* risk they are willing to take, knowing that the negative outcome of the risk would reduce the money earned previously. Therefore, we contribute to the literature on fungibility by investigating how the unethical nature of money may influence how individuals use it, particularly, in the context of risk taking.

We also relate the literature of contingency of risk attitudes. Prior studies showed that the willingness to take risk depends on prior outcomes. For instance, studies found an increase in risk taking after gain (i.e., Ackert et al., 2006; Corgnet et al., 2015; Suhonen and Saastamoinen, 2017), which is consistent with the house money effect (Thaler and Johnson, 1990). Others found evidence that risk taking decreases after gains but increases after loss, which is in favor of the disposition effect (see Shefrin and Statman, 1985; Weber and Camerer, 1998). Imas (2016) showed that prior loss reduces risk taking when it is realized, but increases risk taking when it is a paper loss. Other studies also examined the effect of stake (i.e., Holt and Laury, 2002, 2005; Deck et al., 2008; Lefebvre et al., 2010; Fehr-Duda et al., 2010), emotions (i.e., Nguyen and Noussair, 2014; Cohn et al., 2014; Guiso et al., 2018), and risk taking for others (Andersson et al., 2014; Füllbrunn and Luhan, 2017; Vieider et al., 2016). We differ from these studies in that we show that the nature of money at stake matters for the willingness to take risk. In general, individuals decide more conservatively with earned money than when they do with 'unearned' money (Thaler and Johnson, 1990; Arkes et al., 1994). Hvide et al. (2019) found that subjects who had to earn the endowment from a real-effort task were less risk taking than those whose simply received an endowment. One psychology study by Chen et al. (2017) explored how the willingness to take risk can be influenced by the ethical nature of the money. Subjects in the lying condition were asked to describe a boring task as an *interesting* one, and they were told that the description would be used to recruit future participants for the experiment. They found that subjects in the lying condition were more likely to choose a risky option in the latter risk task. They argued that this tendency is driven by the feeling of guilt which caused subjects who lied to take more risk as a distancing strategy, which is opposite to the psychological cost hypothesis (Thielmann and Hilbig, 2019). However, since the protocol used in Chen et al. (2017) forced participants to tell a lie, such a situation is more likely to arouse the feeling of guilt among the subjects (see Charness and Dufwenberg, 2006; Battigalli et al., 2013). This could imply that the observed effect in Chen et al. (2017) might have been driven by people with an honest principle who experienced a strong cognitive dissonance from a misalignment of attitudes and actions, which eventually induces a disentitlement effect of unethical gain. Our study differs from Chen et al. (2017), as we focus on how the individuals who *decided to lie* to obtain money, rather than being forced to, would take risk with it later on. In other words, our context pertains to the risk taking behavior of dishonest people who gained money unethically rather than that of the honest ones handling the same money. In sum, we contribute to this literature by showing that the propensity to take risk may be influenced by the unethical nature of the money at stake.

Besides the contributions to the literature on fungibility of money and the contingency of risk attitudes, our study also contributes to the literature examining the spillover effects of dishonest decisions on future behavior in an unrelated activity. For instance, the theory of self-concept maintenance (Mazar et al., 2008) postulates that individuals have an innate desire to perceive themselves in a positive light. One phenomenon that supports the theory is moral cleansing (Monin and Miller, 2001; Shalvi et al., 2015), whereby people who committed an immoral action in the past are more likely to engage in moral behaviors later on to restore their positive self-image. A closely related concept is moral balancing whereby individual keeps checks and balances of good and bad actions (see Mazar and Zhong, 2010; Ploner and Regner, 2013; Brañas-Garza et al., 2013; Rahwan et al., 2018). Another example is how individuals who have committed unethical actions in the past tend to later experience *unethical amnesia* of their past immoral behaviors for strategic reasons, in expectation of future misbehavior (Galeotti et al., 2020). We differ from these studies in that we focus on the spillover effect of dishonesty in a risk taking context, which is entirely unrelated to the moral domain. We measure the spillovers on risk taking by comparing money earned from immoral behavior to that earned ethically through luck and effort. Therefore, we add to this growing literature by showing that the willingness to take risk can be affected by the money an individual has obtained unethically in the past.

3 Design

Our design consists of three between-subject treatments - Lying, Effort and Windfall. An experimental session consists of two parts. In Part 1, participants generated an endowment, depending on the treatment assigned. After that, they proceeded to the risk task in Part 2 in which a part of the endowment earned previously was put at stake. The procedure for each treatment is identical except for Part 1, where we varied how the endowment was earned. Participants received specific instruction at the beginning of each part. We first outline the general timeline of the experiment, present the treatment variations, and then discuss the procedures.

Self-reported measures of risk attitudes:

At the beginning of the experiment, we collected two self-reported measures of risk attitudes as used in the German Socio-Economic Panel (SOEP) (Dohmen et al., 2011) on a scale of 0-10: "How do you see yourself: are you generally a person who is fully prepared to take risk or do you try to avoid taking risks?".

We collected this measure of risk in general and in the financial domain. We used these measures to control for participants' baseline risk attitudes across treatments to ensure that any difference observed across our treatments is not based on the selection in terms of risk attitudes.

Part 1: Earning stage

Participants generated an endowment for the upcoming risk task. They could either earn \$2 or \$1. The nature of the task and how an endowment was earned depend on the treatment assigned. This will be discussed in detail later.

Part 2: Risk taking stage

After generating an endowment in Part 1, participants were presented with a risk task. We used the Bomb Risk Elicitation Task (BRET hereafter) developed by Crosetto and Filippin (2013) and adapted it in the loss domain whereby a part of the endowment generated in Part 1 was at stake in the risk task. The adapted BRET represents a set of 100 lotteries with the two extremes being the degenerate lotteries with no uncertainty, while the remaining 98 lotteries are mixed gambles. Therefore, in this version of the BRET, subjects *may* lose a part of the endowment earned previously.

In the risk task, participants were presented with 10x10 cells, each representing a box. They had to decide how many boxes they were willing to collect (0-100 inclusive). For each box collected, they could earn \$0.03. However, a bomb was hidden behind one of the boxes. Each box was equally likely to contain a bomb. The position of the bomb was randomly determined by the program and would be revealed to them at the end of the experiment. The payoff depended on whether the bomb had been collected or not. If the bomb was not collected, they earned the payoff from collecting the boxes, in addition to their endowment. If the bomb had been collected, they earned nothing from collecting the boxes and lost \$0.5 from their endowment.[1]

Before making their decision, participants answered some questions to test their understanding of the task, then they played one practice round to familiarize with the interface. After the practice round, they decided the number of boxes they wanted to collect.

We departed from the standard BRET in two ways. First, following Gioia (2017), participants provided the number of boxes they wished to collect. The program automatically collected the boxes in numerical order from the top left corner. Participants could modify their choice as they wished before validating the decision. (see Figures A3 and A4 in Section D of the Appendix for screenshots of the adapted BRET). Compared to pushing a stop button or manual selection, this version minimizes boredom or impatience which could introduce noise in the decision. Second, while in the standard BRET, collecting a bomb nullifies the earnings from the task, in our design collecting a bomb also destroys

[1]Thus, the set of available lotteries are (\$0, 1), (\$0.03, 0.99; -\$0.5, 0.01), (\$0.06, 0.98; -\$0.5, 0.02), (\$0.09, 0.97; -\$0.5, 0.03), (\$0.12, 0.96; -\$0.5, 0.04), ... , (\$2.88, 0.04; -\$0.5, 0.96), (\$2.91, 0.03; -\$0.5, 0.97), (\$2.94, 0.02; -\$0.5, 0.98), (\$2.97, 0.01; -\$0.5, 0.99), (-\$0.5, 1).

a part of the participant's endowment. This is similar to the variant used in Nielsen (2019) where subjects lose their endowment if a bomb is collected.

3.1 The three treatments

Our three treatments varied in how the participants generated their endowment in Part 1. We explain below the detail of the task used in each treatment.

3.1.1 Lying treatment:

We used the truth-telling mini-game of Gibson et al. (2013). Participants were presented with a hypothetical situation of a CEO who had to announce earnings per share for the previous quarter. They were told that, as a CEO, their compensation depended on the earnings they *announce*. They were also told that the market currently anticipated the announcement of 35 cents per share as earnings, but the true earnings was 31 cents per share. Participants were informed that for this task, they would be paid based on the CEO's compensation (their decision).

In this task, participants could earn \$1 by choosing to announce 31 cents per share (telling the truth), or \$2 by choosing to announce 35 cents per share (telling a lie). We opted for this particular task over other cheating tasks in the literature because it allows us to identify the cheaters at the individual level[2] since the decision to lie in the CEO task is observable ex-post. Alternatives include variants of the cheating game (i.e., Fischbacher and Föllmi-Heusi, 2013; Cohn et al., 2014; Abeler et al., 2019). While these tasks have the advantage of a lower reputation concern, they could give rise to interpretation issues. For instance, in the cheating game *à la* Fischbacher and Föllmi-Heusi (2013), participants reporting a high payoff outcome *could have* got lucky and thereby did not earn the money through lying. Any observed effect could then be an artifact of getting lucky in disguise of 'lying'. Repeating the task as in Cohn et al. (2014) creates either several levels of wealth (in case of paying all rounds) or self-serving interpretation of the payoff (in case of one randomized round) since even dishonest participants have *in some rounds* actually observed the high payoff outcome.

3.1.2 Effort and Windfall treatments:

In the Lying treatment, participants could earn \$2 or \$1, depending on their choice in the CEO task. We, therefore, similarly implemented two levels of endowment for the Effort and Windfall treatments. In the Effort treatment, participants took part in the Encoding task (i.e., Erkal et al., 2011; Gangadharan et al., 2017; de Quidt et al., 2017). They were given a table with letter-number

[2]Like the CEO task, the task by Gneezy et al. (2018) offers the same advantage. However, in their task some participants can get lucky and actually observe a high payoff state. Since all participants are presented with the same hypothetical situation in the CEO task, there are no lucky people in our setting.

pairs and were asked to encode as many words as possible within 8 minutes by entering the number corresponding to each letter of each given word. They earned \$2 if they correctly solved at least 39 words; otherwise they earned \$1. In the Windfall treatment, participants did not have to perform any task. Instead, they were informed that they would receive either \$2 or \$1 with an equal chance. We chose these thresholds such that we expected to have in each treatment about 50% of participants with a high or a low endowment.

3.2 Procedures

Individuals located in the United States were recruited through Amazon Mechanical Turk to participate in the experiment. In total, 1048 individuals participated in the experiment.[3] 373 participated in the Lying treatment, 372 in the Windfall treatment, and 303 in the Effort treatment. We removed 8 individuals from the analysis since they collected 100 boxes in the BRET, revealing a misunderstanding of the rules of the game. Therefore, we are left with 1040 observations. The summary statistics of their characteristics are shown in Table A1. There is no significant differences in the characteristics, except for the age between participants in the Effort and Windfall treatments. Participants in the Effort ($\text{Mean}_{\text{Age}} = 42.54$, SD = 12.94) are slightly older than those in the Windfall treatment ($\text{Mean}_{\text{Age}} = 40.55$, SD = 12.83; $p = 0.0355$, Mann-Whitney U test). At the end of the experiment, participants learned about the location of the bomb in the BRET, and answered a short questionnaire and attention checks. They received a fixed payment of \$0.50, plus an additional payment depending on their earnings in the CEO task, the Encoding task or the lottery, and the outcome of the BRET. They earned on average \$2.39 (SD = 0.82). The average duration of the experiment was 10 minutes (SD = 0.19). Instruction can be found in Section D of the Appendix.

A total of 557 individuals earned \$2 in Part 1 of the experiment. 194 are in the Lying treatment, 183 in the Windfall treatment, and 180 in the Effort treatment. The proportions of individuals who earned \$2 in the Lying and Windfall treatments are not statistically different ($p = 0.534$, chi-square test), but are different between the Lying and Effort treatments ($p = 0.047$, chi-square test) and between the Windfall and Effort treatments ($p = 0.01$, chi-square test). Their characteristics are summarized in Table A2 in the Appendix. They are comparable except for the household size of those in the Effort and Windfall treatments.

[3]The number of observations is based on the following power calculation we pre-registered. Assuming a type-I error rate of 0.05, a power level of 0.8 and a small effect size (Cohen's d = 0.3), the required number of observations to uncover the hypothesized effect between the Lying and Windfall treatments is 184 observations per treatment. No existing study gives a direct insight on the lying rate in the CEO task with the MTurk samples. The average lying rate (excluding no lying incentive) among student samples in Gibson et al. (2013) is 68%. The pilot conducted yields a similar lying rate at 63%. Given this, we conservatively assume a lying rate of 60% and set the required number of observations per treatment at 307, resulting in a total number of observations of 921 (307x3). However, contrary to this initial power calculation, the empirical lying rate turned out to be only 50%. Given this lower lying rate, we collected about 65 additional observations for the Lying and Windfall treatments each in order to uncover the hypothesized effect.

Reported household size in the Effort treatment ($\text{Mean}_{\text{HH}} = 2.494$, SD = 1.31) is significantly smaller than that in the Windfall treatments ($\text{Mean}_{\text{HH}} = 2.825$, SD = 1.36, M-W test). Larger household may have larger expenditure, which may then affect risk taking. Since they are positively correlated, we choose to control only for expenditure in the regression analysis to minimize collinearity. Besides this, at the end of experiment we asked participants to rate how easy was it to understand the instruction of the experiment, and those in the Windfall treatment reported slightly poorer understanding compared to those in the Lying and Effort treatments. Since the instructions of each treatment were different, this measure is somewhat noisy. Despite that, it may raise concerns if participants in the Windfall treatment collected more boxes because of their poorer understanding. This is, however, unlikely as the correlation between the number of boxes collected and understanding rating (i.e., higher rating implies poorer understanding) is low (Pearson's Correlation Coeff. = -0.0239).

4 Conjectures

In this section, we formulate two behavioral conjectures regarding participants' risk taking conditional on the type of money at stake in the BRET. Our treatments varied in *how* participants earned their endowment in Part 1. To answer our research questions, we focus on the risk taking of the participants who earned $2 endowment in the different treatments as only those who earned $2 in the Lying treatment earned unethical money through lying, while those who earned $1 in the Lying treatment earned it honestly. The analysis of participants who earned $1 in Part 1 is reported in Section C in the Appendix.

In the Effort treatment, participants earned money through effort, while in the Windfall treatment, they earned it through luck. The comparison between the Effort and Windfall treatments allows us to replicate the entitlement effect, which posits that people are more protective of an endowment generated through effort rather than luck, because of a stronger sense of entitlement. In the context of our experiment, we anticipate that participants in the Effort treatment should exhibit relatively lesser risk taking in the BRET compared to those in the Windfall treatment because the former group earned their endowment through effort while the latter group earned it through luck.

The comparison of risk taking in the Lying and Effort treatment allows us to identify whether a moral cost and a cognitive cost both lead to a more conservative risk taking. In the Lying treatment, participants who lied in the CEO task by announcing '35' instead of '31' gained $2. These dishonest participants earned the money that did not belong to them at a possible psychological cost of lying. In the Effort treatment, participants ethically earned $2 in exchange of their cost of effort. Controlling for the SOEP, we can compare the risk taking behavior of the dishonest participants in the Lying treatment and those who earned money ethically through effort in the Effort treatment. Dishonest individuals may *subjectively* feel entitled to the unethical gain as they incurred the cost of lying even though it is *objectively* not their money. If the psychological cost hypothesis (Thielmann and Hilbig, 2019) holds, we expect that those using money earned unethically in the CEO task do not take risk differently from those who earned it ethically through effort. This should be the case if both groups exhibit a sense of entitlement. We therefore formulate the first conjecture as follows.

Conjecture 1 (Unethical vs. Effort money) *Controlling for their general attitudes towards risk, individuals whose previous earnings were earned unethically do not take risk differently from those who take risk with the money earned ethically from providing effort.*

In the Windfall treatment, participants earned \$2 by luck and without any effort cost. If a psychological cost generated by lying engenders a sense of entitlement, as posited by Thielmann and Hilbig (2019), we then anticipate that dishonest subjects should exhibit lower risk taking relative to those whose endowment was a windfall gain. We can therefore formulate the second conjecture as below.

Conjecture 2 (Unethical vs. Windfall money) *Controlling for their general attitudes towards risk, individuals whose previous earnings were earned unethically exhibit less risk taking with these earnings than those whose previous earnings were windfall money.*

The design and behavioral conjectures have been pre-registered at AsPredicted (#49535).

5 Results

As our research questions concern the comparisons of risk taking with unethical money with that earned though luck and effort respectively, this section reports an analysis of individuals who earned \$2 in Part 1 of the experiment. Please refer to Section C in the Appendix for the analysis of participants who earned \$1 in Part 1. We first report the results using non-parametric tests, followed by regression analyses. We then report results from the structural estimation to gain additional insights as to which underlying parameters drive the change in risk taking across treatments. Finally, we report an exploratory analysis.

Figure 1 plots the cumulative distribution of the number of boxes collected in the BRET by individuals in each treatment. Two points are noteworthy. First, participants in the Effort treatment seem to collect fewer boxes compared to those in the Windfall or Lying treatments. Second, there seems to be no difference in the number of boxes collected by those in the Lying and Windfall treatments. Kolmogorov-Smirnov tests (KS test hereafter) indicate a significant difference in risk taking in the BRET between participants in the Effort and Windfall treatments. Those in the Effort treatment ($\text{Mean}_{\text{BRET}} = 23.85$, SD =

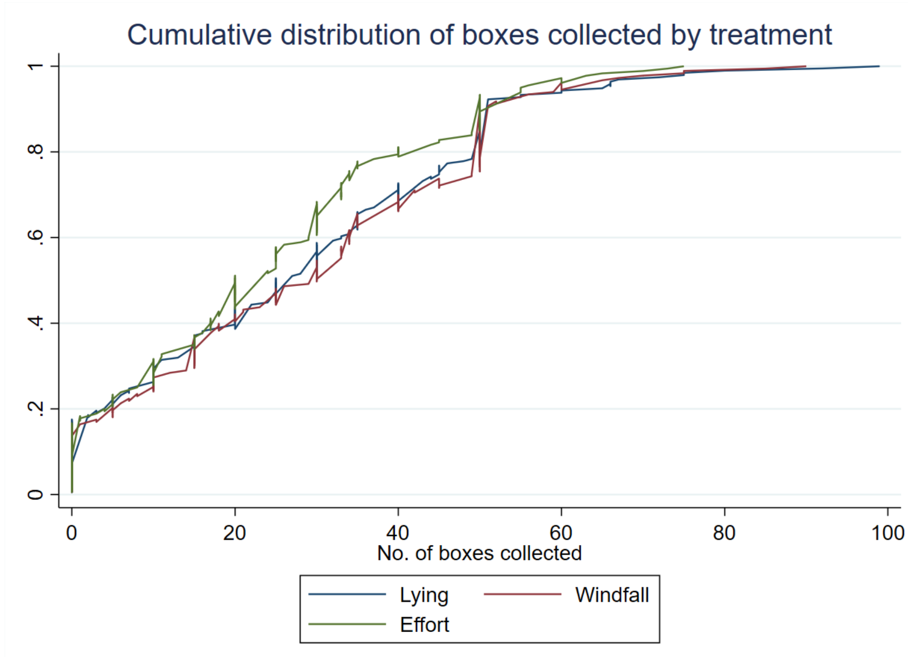

Figure 1: Cumulative distribution of boxes collected in the BRET by treatment

18.75) collected significantly fewer boxes than those in the Windfall treatment (Mean$_{\mathrm{BRET}}$ = 28.13, SD = 20.95; $p = 0.018$, KS test). However, this difference is only weakly significant using Mann-Whitney U test (M-W test hereafter) ($p =$ 0.0571). These findings replicated the entitlement effect found in the literature whereby individuals who earned an endowment through effort feel entitled to their wealth and, thereby, are relatively more protective of it compared to those who received a windfall endowment.

The main results go against both of our conjectures. The dishonest individuals who earned money by lying in the CEO task (Mean$_{\mathrm{BRET}}$ = 27.33, SD = 21.51) collected significantly more boxes in the BRET than those who earned the same ethically through effort (Mean$_{\mathrm{BRET}}$ = 23.85, SD = 18.75; p=0.023, KS test). There is no significant difference between the number of boxes collected by the dishonest subjects and those who earned the same amount through luck in the Windfall treatment (Mean$_{\mathrm{BRET}}$ = 28.13, SD = 20.95; $p = 0.983$, KS test). Note, however, that M-W tests do not yield significant differences between any treatment pair at conventional levels (p=0.162 and 0.588 respectively).

Next, we performed regression analysis to confirm the results of our non-parametric tests. Though individuals who earned $2 across the three treatments are not significantly different in their SOEP, age and gender (see Table A2), there can be concerns about selection issues into the $2 group in Lying and Effort treatments as decisions in Part 1 are endogenous in these treatments. Table A3 in the Appendix reports, for each treatment, a Probit regression in which the dependent variable is equal to one if the participant earned $2 in Part 1 and zero otherwise. We included three key socio-demographics (SOEP, age and gender) as independent variables because we believe they may influence the chance of receiving $2 in Part 1 in Lying and Effort treatments. The coefficient of age is negative and significant at 1% level for Lying and Effort treatments, which indicates that we need to control for the selection issue in our regression analysis.

Our preferred model is the Poisson regression with sample selection (i.e., Stata's 'Heckpoisson'). Like the Heckman Selection model, this model handles endogenous sample selection, but is more appropriate in our case as the dependent variable is a count data. To correctly account for the selection issue, we ran the heterogeneous treatments model in the selection equation, where the independent variables are the interaction terms of treatment dummies and SOEP, age and gender respectively.[4] Table 1 reports the marginal effects from the Poisson regressions with sample selection, in which the dependent variable is the number of boxes collected in the BRET. In Model 1, the independent variables include the treatment dummies (with the Effort treatment as a reference category). We also controlled SOEP, age[5] (reported in z-scores), and gender, which are important determinants of risk taking. Model 2 replicates model 1, but further controlled for educational attainment and weekly expenditure.[6] The estimated correlation between the selection errors and the outcome errors (ρ) and the Akaike's and Schwarz's Bayesian information criteria (AIC and BIC) are reported for each model.

The Wald tests of independent equations indicate that ρ is statistically significant ($p < 0.01$), confirming that there is selection. Model 1 indicates that dishonest individuals who earned money through lying collected about 7 more boxes than those who who earned the same through effort. Individuals who earned money through luck collected about 22 more boxes than those who who earned the same through effort. This estimate is quite large, which may be due to a lack of control variables. When further controlling for educational attainment and weekly expenditure (model 2), compared to individuals in the Effort treatment, dishonest individuals earned money from lying collected 20 more boxes, and those who earned money through luck collected 17 more boxes. Though the marginal effect of the Lying treatment is slightly higher than that of the Windfall treatment, the difference is not significant (Wald test, $p =$ 0.1180). Based on the values of AIC and BIC, model 2 fits our data slightly

[4]We model the selection equation this way to correctly estimate the impact of these characteristics on the probability in receiving $2 for each treatment separately. If we were to estimate without the treatment interactions, it implies that we assume that their effects on the probability of receiving $2 are same across treatments, which is certainly not the case.

[5]Exclusion of the selection variable from the outcome equation is not necessary, but it is often recommended in the literature whenever possible (see Heckman, 1978; Wilde, 2000; Miranda and Rabe-Hesketh, 2006). Compared to the models that exclude age from the outcome equation, the Information Criteria of the models with age indicate a better fit for our data.

[6]Weekly expenditure positively correlates with household size (i.e., the larger the household size, the larger the expenditure.) Therefore, to minimize collinearity, we included only weekly expenditure which is more intuitive to interpret.

Table 1: Determinants of risk taking in the BRET (Main results: $2 group)

	(1)		(2)	
	ME	St.Err.	ME	St.Err.
Effort	ref.		ref.	
Lying	6.970***	(1.489)	19.97***	(1.581)
Windfall	22.42***	(2.340)	17.47***	(1.493)
SOEP	11.52***	(0.799)	10.32***	(0.784)
Male	2.806*	(1.487)	17.03***	(1.332)
Age	-11.15***	(0.982)	1.630**	(0.726)
High school			ref.	
Bachelor			8.912***	(1.451)
Graduate			-9.427***	(1.582)
$0 - $29			ref.	
$30 - $49			2.508	(2.273)
$50 - $79			29.30***	(2.938)
$80 - $119			10.83***	(2.263)
$120 - $174			0.872	(2.018)
$175 - $249			6.896***	(2.394)
$250 - $350			6.975***	(2.481)
More than $350			28.71***	(3.246)
N	1040		1040	
ρ	-0.44		-0.40	
AIC	6502.49		6453.85	
BIC	6601.43		6597.31	

Notes: The table reports the marginal effects (ME) using Poisson regression with sample selection. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

better, though the marginal effects are still quite large. We will later show in the exploratory result the estimates that are more in line with the results of our non-parametric analysis after allowing for heterogeneous treatment effects based on individual baseline risk attitudes. Despite large marginal effects, the estimations of Table 1 are consistent with the non-parametric results. This leads us to the two following results.

Result 1 (Unethical vs. Effort money). Dishonest individuals who earned money through lying collected significantly more boxes in the BRET compared to those who earned money ethically through providing effort. Therefore, conjecture 1 is not supported.

Result 2 (Unethical vs. Windfall money). There is no significant difference between the number of boxes collected in the BRET by dishonest individuals who earned money through lying and those who earned it through luck. Therefore, conjecture 2 is not supported.

To gain additional insights on different parameters that underlie the results shown above, we performed the structural estimation with Maximum likelihood to estimate the concavity of the utility function, loss aversion parameter and probability weighting function of the participants who earned \$2 in the three treatments. Prior studies have employed this approach to estimate the treatment effects on the estimated risk preference parameters. For instance, Andersson et al. (2014) found that making risky decisions for others reduces loss aversion. When risky decisions may result in losses, individuals take less risk for themselves than when they decide for others. They interpreted their finding that loss aversion is 'a bias in decision making driven by emotions and that these emotions are reduced when making decisions for others'. Similarly, Vieider et al. (2016) found a reduction in probabilistic sensitivity and loss aversion when individuals are responsible for other's and own payoffs compared to making individual decisions. In the context of this study, we are interested if the nature of money affects the estimated risk preference parameters. For instance, an individual can be loss averse, but may become less or more loss averse, depending on the type of money at stake. Section B in the Appendix provides a detailed outline of our parametric assumptions.

We estimated the concavity of the utility function (α), loss aversion parameter (λ) and probability weighting function (a) by making them depend on the treatment dummies. We added SOEP, age, gender, education attainment and weekly expenditure as control variables (as done in the regression analyses). We allowed for heteroskedasticity by making the variance of the error term (ε) depend on educational attainment.

Table 2 reports the estimated risk preference parameters. How individuals earned money in the experiment does not affect the utility curvature. There is no significant difference in the curvature between each treatment pair (Wald tests: Lying vs. Effort: $p = 0.618$; Lying vs. Windfall: $p = 0.774$; Effort vs. Windfall: $p = 0.802$). The SOEP is significant at positive at 5%. The loss aversion parameter, however, somewhat varies by the treatments. The value of loss aversion in the Lying treatment is the smallest, followed by that in the Windfall and Effort treatments respectively. The difference between the Lying and Effort treatments is significant (Wald test, $p < 0.01$), but there is no significant difference with the Windfall treatment (Wald test, $p = 0.171$). There is a significant difference in the loss aversion parameter between the Windfall and Effort treatments (Wald test, $p = 0.05$). The coefficients of male and age are negative and significant at 1% and 5% respectively. Finally, how individuals earned money does not affect the probability weighting function. These estimates are in line with our results that dishonest individuals and those who earned money through luck took more risk in the BRET compared to those who earned the same through effort, and this is mainly reflected in the loss aversion parameter.

Table 2: Maximum Likelihood estimation

	(1)	
	CRRA Specification	
	Coeff.	St.Err.
α		
Lying	1.38706***	0.136
Windfall	1.37807***	0.135
Effort	1.36997***	0.137
SOEP	0.040971**	0.016
Male	0.016923	0.028
Age	0.018573	0.016
$30 - $49	0.064025	0.142
$50 - $79	-0.23697*	0.134
$80 - $119	0.18727	0.145
$120 - $174	0.13105	0.144
$175 - $249	-0.23135*	0.133
$250 - $350	0.12999	0.149
More than $350	-0.24854*	0.140
High School	-0.0099708	0.061
Bachelor	-0.061607	0.056
λ		
Lying	2.66767***	0.395
Windfall	2.87960***	0.399
Effort	3.20039***	0.409
SOEP	0.0072388	0.075
Male	-0.43733***	0.145
Age	-0.16851**	0.080
$30 - $49	-1.07862**	0.474
$50 - $79	0.13522	0.375
$80 - $119	0.45636	0.420
$120 - $174	0.13873	0.422
$175 - $249	0.27223	0.377
$250 - $350	-0.49277	0.493
More than $350	0.35944	0.391
High School	0.12106	0.217
Bachelor	0.11471	0.181
a		
Lying	-0.057336	0.134
Windfall	-0.068689	0.134
Effort	-0.11873	0.135
SOEP	-0.030841***	0.011
Male	0.057378**	0.028
Age	-0.0013197	0.011
$30 - $49	-0.017780	0.131
$50 - $79	0.45412***	0.140
$80 - $119	0.040112	0.125
$120 - $174	0.051670	0.125
$175 - $249	0.40406***	0.141
$250 - $350	0.10130	0.126
More than $350	0.42771***	0.148
High School	-0.046735	0.052
Bachelor	-0.022693	0.050
σ		
High School	-0.00014364	0.000
Bachelor	-0.00071714*	0.000
Constant	0.0049617***	0.000
N	557	

5.1 Exploratory results

In this section, we report two additional regression analyses that were not included in our pre-registration, but fit the data better. In particular, we explored if individuals with different baseline risk attitudes (measured by SOEP) reacted differently to our treatments.

Table 3 reports the marginal effects of the Poisson regression with sample selection, in which the dependent variable is the number of boxes collected in the BRET. We ran two models, which correspond to those reported in Table 1, except that we additionally included the interaction terms of the treatment dummies and SOEP in the independent variables in the outcome equation.

Table 3: Determinants of risk taking in the BRET (Exploratory results: $2 group)

	(1)		(2)	
	ME	St.Err.	ME	St.Err.
Effort	ref.		ref.	
Lying	11.30***	(1.967)	3.449**	(1.540)
Windfall	8.685***	(1.996)	4.563***	(1.470)
SOEP	9.207***	(0.878)	11.25***	(0.690)
Male	1.464	(1.453)	16.21***	(1.260)
Age	-5.400***	(0.767)	-6.652***	(0.668)
High school			ref.	
Bachelor			-19.09***	(1.708)
Graduate			-31.55***	(1.914)
$0 - $29			ref.	
$30 - $49			3.355	(3.027)
$50 - $79			-2.789	(2.757)
$80 - $119			-7.856***	(2.493)
$120 - $174			-6.632**	(2.677)
$175 - $249			-12.24***	(2.499)
$250 - $350			-3.276	(2.660)
More than $350			1.259	(2.843)
N	1040		1040	
ρ	-0.28		-0.24	
AIC	6476.38		6427.89	
BIC	6585.22		6581.25	

Notes: The table reports the marginal effects (ME) using Poisson regression with sample selection. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

The Wald tests of independent equations indicate that ρ is statistically significant ($p < 0.01$), confirming that there is selection. Based on the Information

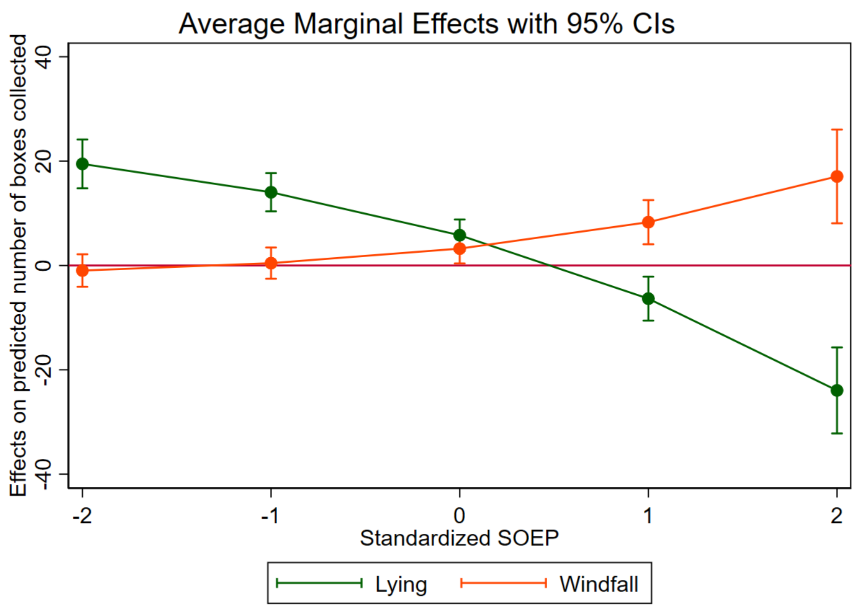

Figure 2: Average marginal effects of the treatments at given baseline risk attitudes ($2 group)

Criteria, the inclusion of the interaction terms improves the fit to the data for each corresponding model. After accounting for how individuals with different baseline risk attitudes reacted to our treatments (model 1), dishonest individuals who earned money through lying collected about 11 more boxes than those who earned the same through effort. Those who earned money through luck collected about 9 more boxes than those who earned the same through effort. The difference between the marginal effects of Lying and Windfall treatments is only weakly significant (Wald test, $p = 0.054$). When further controlling for educational attainment and weekly expenditure (model 2), compared to individuals in the Effort treatment, dishonest individuals earned money from lying collected 4 more boxes, and those who earned money through luck collected 5 more boxes. The difference between the marginal effects of Lying and Windfall treatments is significant (Wald test, $p = 0.3625$). Compared to model 2 of Table 1, these estimates are more in line with the results of the non-parametric analysis, and confirms both of our results. Since the Information Criteria indicates a better fit, the interaction terms seem to be important in explaining risk taking behaviors in the BRET.

To examine the interaction effects, Figure 2 plots the marginal effects of the Lying and Windfall treatments of model 2 of Table 3 (Effort treatment as a reference category) on the predicted number of boxes collected in the BRET for a given level of SOEP (reported in z-score). This figure suggests that though the marginal effects are positive for the Lying and Windfall treatments, they come from different groups of individuals. For the Lying treatment, the marginal effects are positive for risk averse and average risk takers (see from below the mean SOEP), while for the Windfall treatment the effects are positive for risk loving people (see from above the mean SOEP). Thus, we can conclude from Figure 2 that the increase in risk taking with unethical money is driven by individuals who are 'risk averse' at their baseline.

6 Discussion and conclusion

We investigated in this paper whether individuals make different risky decisions when the negative outcome of risky decision reduces the earnings previously realized by lying, or as a result of luck or effort. We test whether unethical money is treated like the money earned through effort which could occur if there is a moral cost of lying that leads to an entitlement effect. If the psychological cost of lying triggers a sense of entitlement as in the case of effort cost (Thielmann and Hilbig, 2019), there should be no difference between risk taking when the money was obtained unethically through lying and when it was earned ethically through effort, and it should be lower than the risk taking when the money was earned through luck.

Contrary to these conjectures, we found that dishonest individuals who earned money at a moral cost of lying undertook more risk when the negative outcome could reduce that earning compared to when they earned it ethically through effort. In addition, there was no difference in risk taking between individuals who earned money by lying or luck. This should imply that dishonest individuals treated unethical gain similar to a windfall gain. The structural estimation reveals that how participants earned money mainly affected the loss aversion parameter. Dishonest individuals and those who earned money through luck were less loss averse than those who earned the same through effort. Lastly, we found that the increase in risk taking with unethical money came from individuals who were relatively risk averse at baseline, while the increase in risk taking with windfall money came from those who were relatively risk loving at baseline.

We can rule out money laundering as a motivation for an increased risk taking with money earned by lying. In one of the experiments of Imas et al. (2020), the authors found that individuals who lied in the deception game were more willing to expose more unethical money to risk when the money would be laundered, compared to when it would not be laundered. We argue that an increased risk taking with unethical money in our experiment is not a motivation to launder the unethical gains as in Imas et al. (2020). The premise of mental money laundering proposed by Imas et al. (2020) rests on the notion of a *physical exchange* of cash for the same amount from a different arbitrary source. This feature is not present in our setting. In addition, their lottery task was designed to *launder* money (i.e., 'dirty' bills are exchanged with clean ones), while our risk task involved deciding *how much* risk to take with part of the money previously earned at stake. A major difference with our risk task is that in the adapted BRET, the more boxes participants collect, the higher is the probability of losing the money at stake, while in their laundering lottery, the risk of losing is fixed. Thus, money laundering does not explain risk taking of participants in our experiment.

An explanation as to why we did not observe an entitlement effect of psychological cost of lying, as posited by Thielmann and Hilbig (2019), may be that the lying cost incurred in the CEO task might have been low. This, however, is not to say that lying in the CEO task does not entail any moral cost, as there is evidence that subjects in the experiment perceive lying in the CEO task as socially inappropriate (see Huber and Huber, 2020) but since lying in the CEO task is observable ex-post, individuals who choose to lie may be those who do not care about the moral cost of lying, while those who choose an honest option have a higher moral cost of lying. It is then plausible that dishonest individuals in our experiment did not suffer *enough* moral cost to engender a sense of entitlement. Thus, our sample of dishonest individuals may perceive the unethical gain simply as an *'easy money'*. This interpretation is consistent with the result from structural estimation where the loss aversion parameter was smaller in the Lying treatment than in the Effort treatment, while there was no difference in the loss aversion between the Lying and Windfall treatments. This could imply that dishonest individuals may care to a *lesser* degree when it comes to risking unethical money since it was earned easily. As Andersson et al. (2014) has noted, loss aversion being a bias may be attenuated by emotions, which in our case, may be reduced since it was easily obtained. Future research can explore the interplay of emotions and moral cost to extend our understanding of risk taking with unethical money. Another possible extension would be to investigate the effect of partial lying, which is challenging given it is difficult to identify at an individual level if the person had actually lied or not. Given the identification issue aside, partial liars may be susceptible to justify the entitlement of unethical gain.

Overall, the results from our experiment suggest that the mere nature of unethical gain matters in the context of risk taking. Individuals treat money earned unethically through lying more like a windfall gain rather than hard-earned money. In addition, we found that an increase in risk taking with unethical money comes from those individuals who are risk averse at their baseline. This, therefore, implies that they are willing to take more risk with unethical money than what they typically do with money earned ethically. This calls for a need to monitor and curb risk taking behaviors in poorly regulated industries where fraud is common to avoid unnecessary negative repercussions of risk taking by dishonest individuals. This phenomenon is especially relevant for the financial industry where the decision-making environment is already inducive to risk taking behavior. For instance, Abdellaoui et al. (2013) documented that financial professionals were less loss averse than typically observed in the student sample, while Haigh and List (2005) found that professionals exhibited myopic loss aversion to a greater extent compared to the student sample. Individuals have been shown to take more risk when they decide for others (Andersson et al., 2014; Vieider et al., 2016). Incentive schemes such as ranking and tournament have been shown to promote risk taking among underperforming professionals (Kirchler et al., 2018, 2019). The result of our paper brings attention to an additional driver of risk taking, which is the unethical nature of money.

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A Additional tables

Table A1: Summary Statistics (All participants)

	(1) Lying		(2) Windfall		(3) Effort		(1-2)	(1-3) p value	(2-3)
	Mean	SD	Mean	SD	Mean	SD			
Male (dummy)	0.513	0.500	0.531	0.500	0.502	0.501	0.626	0.761	0.445
Age (years)	41.500	12.691	40.553	12.832	42.542	12.942	0.2174	0.2660	0.0355**
Spending (1-8)	4.710	1.969	4.564	1.948	4.761	1.896	0.2155	0.8519	0.1617
Education (1-4)	2.901	0.676	2.853	0.678	2.850	0.664	0.3327	0.3445	0.9904
SOEP (0-10)	4.487	2.548	4.578	2.704	4.372	2.454	0.6443	0.6807	0.3986
SOEP Fin (0-10)	4.121	2.647	4.180	2.646	3.983	2.483	0.7435	0.6425	0.4383
Household size (1-6)	2.624	1.317	2.760	1.370	2.608	1.366	0.2065	0.7238	0.1221
Income source (0-3)	1.734	0.750	1.774	0.698	1.844	0.605	0.6337	0.1239	0.2716
Employment (1-4)	2.871	0.475	2.886	0.515	2.930	0.414	0.4701	0.0844*	0.3396
Understanding (0-9)	2.417	3.503	2.736	3.548	2.598	3.540	0.1288	0.3381	0.6233
Proportion of $2	0.522	0.500	0.499	0.501	0.598	0.491	0.534	0.047**	0.010***
Observations	372		367		301				

Notes: The p-values reported are from chi-square tests for binary variables and ranksum tests for interval variables.

Table A2: Summary Statistics ($2 group)

	(1) Lying		(2) Windfall		(3) Effort		(1-2)	(1-3) p value	(2-3)
	Mean	SD	Mean	SD	Mean	SD			
Male (dummy)	0.531	0.500	0.541	0.500	0.489	0.501	0.845	0.416	0.321
Age (years)	38.799	10.919	39.754	12.619	40.017	11.726	0.7480	0.3447	0.6423
Spending (1-8)	4.773	1.937	4.536	1.935	4.789	1.861	0.1423	0.9066	0.1724
Education (1-4)	2.861	0.672	2.907	0.693	2.911	0.645	0.5271	0.4363	0.9125
SOEP (0-10)	4.474	2.545	4.612	2.717	4.361	2.281	0.6438	0.7734	0.4583
SOEP Fin (0-10)	4.098	2.584	4.197	2.645	4.056	2.330	0.7689	0.9351	0.8280
Household size (1-6)	2.675	1.393	2.825	1.364	2.494	1.318	0.2631	0.2116	0.0134**
Income source (0-3)	1.773	0.705	1.820	0.676	1.856	0.580	0.6725	0.3983	0.6956
Employment (1-4)	2.881	0.409	2.880	0.531	2.911	0.400	0.8249	0.3369	0.5578
Understanding (0-9)	2.340	3.517	2.814	3.579	2.044	3.244	0.0956*	0.7126	0.0347**
Observations	194		183		180				

Notes: The p-values reported are from chi-square tests for binary variables and ranksum tests for interval variables.

Table A3: Determinants of receiving an endowment of $2

	(1) Lying	(2) Windfall	(3) Effort
Pr($2)			
SOEP	-0.0637	0.00774	-0.0144
	(0.0689)	(0.0634)	(0.0804)
Male	0.0362	0.0325	-0.152
	(0.135)	(0.134)	(0.155)
Age	-0.302***	-0.0762	-0.314***
	(0.0705)	(0.0660)	(0.0750)
Constant	0.0341	-0.0264	0.361***
	(0.0954)	(0.0963)	(0.111)
N	372	367	301

Notes: SOEP and Age reported in z-scores.
Standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

B Structural estimation

We follow the modeling strategy outlined in Harrison and Rutström (2008) to estimate the concavity of the utility function, loss aversion parameter and probability weighting function of subjects in our sample.

In our experiment, we adapted the Bomb Risk Elicitation Task (or BRET) of Crosetto and Filippin (2013). Participants' decision in the task can be summarized as the desired choice of lottery among the set of lotteries.

$$L = \begin{cases} -\theta & \text{with probability } \frac{k}{100} \\ \gamma k & \text{with probability } \frac{100-k}{100} \end{cases} \tag{1}$$

In this adapted version, participants may gain a certain amount of money (γk) or lose a part of the payoff θ earned in the previous task at certain probabilities determined by the parameter $k \in [0, 100]$, while $\gamma > 0$ is a scale factor and $\theta > 0$. By determining the value of k, subjects reveal their preferred lottery among 101 lotteries, which is fully described in terms of gain, loss, and their associated likelihood.

Under prospect theory (Tversky and Kahneman, 1992), subjects value the lottery L according to

$$PT(L) = w_+\Big(\frac{100-k}{100}\Big)v(\gamma k) + w_-\Big(\frac{k}{100}\Big)v(-\theta) \tag{2}$$

where $w_+(p)$ and $w_-(p)$ denote the probability weighting functions in the gain and loss domains respectively, and $v(\cdot)$ denote the value function.

Therefore, subjects choose k to maximize their utility function described in (2). The first order condition with respect to k can be written as

$$\begin{aligned} \frac{dPT(L)}{dk} =& \frac{-1}{100}w_+^{'}\Big(\frac{100-k}{100}\Big)v(\gamma k) + \gamma v^{'}(\gamma k)w_+\Big(\frac{100-k}{100}\Big) \\ &+ \frac{1}{100}w_-^{'}\Big(\frac{k}{100}\Big)v(-\theta) = 0 \end{aligned} \tag{3}$$

In the loss domain, we fixed the level of outcome at θ.

In the experiment, we allowed participants to choose $k = 0$. So, to ensure that (3) is well defined at $k = 0$, we need to assume that the utility function and weighting functions are differentiable at zero. Therefore, we assume that the utility function is given by the variation of power utility function (see Vendrik and Woltjer, 2007) and the probability weighting function is given by Rieger and Wang (2006).

$$v(x) = \begin{cases} \frac{(x+\gamma)^\alpha - \gamma^\alpha}{\alpha}, & x \geq 0 \\ -\lambda\frac{(-x+\gamma)^\alpha - \gamma^\alpha}{\alpha}, & x < 0 \end{cases} \tag{4}$$

$$w(p) = p + \frac{3(1-b)}{a^2 - a + 1}(ap - (1+a)p^2 + p^3) \tag{5}$$

where α is the concavity of the utility function. With this specification in terms of utility curvature in the gain domain (loss domain), $\alpha = 1$ signifies risk neutrality, $0 < \alpha < 1$ signifies risk aversion (risk seeking) and $\alpha > 1$ signifies risk seeking (risk aversion). For (5), a is the probability at which the weighting function crosses the 45° line. For the same value of b, the parameter a captures the elevation (i.e., optimism/pessimism) of the weighting function of the subjects.

For simplicity purpose, we assume identical weighting function (Kahneman and Tversky, 1979; Nielsen, 2019). Similarly, with Nielsen (2019), we will fix $b = 0.50$ and just estimate the value of a.[7]

We assume that $\frac{dPT(L)}{dk}$ given by (3) is observed with an additive error term $\varepsilon \sim N(0, \sigma^2)$, so that

$$\begin{aligned} \varepsilon_i =& \frac{-1}{100} w_+^{'}\Big(\frac{100-k_i}{100}\Big) v(\gamma k_i) + \gamma v^{'}(\gamma k_i) w_+\Big(\frac{100-k_i}{100}\Big) \\ &+ \frac{1}{100} w_-^{'}\Big(\frac{k_i}{100}\Big) v(-\theta) = 0 \end{aligned} \tag{6}$$

where i denotes the individual participant in the experiment, and $v(\cdot)$ and $w(\cdot)$ are given by (4) and (5) respectively.

The log likelihood of the sample can be written as

$$LogL = -nln(\sigma) - nln(\sqrt{2\pi}) - \frac{1}{2}\sum_i^n (\frac{\varepsilon_i}{\sigma})^2 \tag{7}$$

where ε_i is given by (6).

The maximization of the log likelihood function given in (7) with respect to α, a, λ and σ provides the estimates of these parameters.

There are three treatments in our experiment and we want to test our hypotheses that k differ across treatment. We estimate the treatment effect on α, a, λ by making them dependent on the treatments.

$$z = z_1 T_1 + z_2 T_2 + z_3 T_3 + z_4 X \tag{8}$$

where $z \in \{\alpha, a, \lambda\}$ and T are the treatment dummy for each of our treatment. X contains additional control variables (SOEP, age and gender).

[7] We obtained $b = 0.50$ by fitting Tversky and Kahneman (1992) results on the probability weighting function of Rieger and Wang (2006).

C Analysis of the $1 group

In this section, we report an exploratory analysis of the risk taking behavior of the $1 group.

How participants earned $1 differ, depending on the treatment assigned. In the Lying treatment, participants purposefully chose an honest option in the CEO task. Therefore, they earned $1 by being honest, forgoing the gain from being dishonest. We refer to this group as ‘honest individuals’. In the Effort treatment, participants could not reach the threshold set in the Encoding task. Since their performance fell short, they received only $1 (which was the base pay irrespective of their performance). We refer to this group as ‘low performers’. In the Windfall treatment, participants received $1 from the lottery with an equal chance. Therefore, they received $1 by being unlucky. We refer to them as ‘unlucky individuals’.

Figure A1 reports the number of boxes collected in the BRET by treatment and endowment level.[8] Note that unlike $2 group, participants who obtained $1 in Part 1 of the experiment are not comparable in terms of age (see Table A4). Thus, the differences in the graph must be viewed with care.

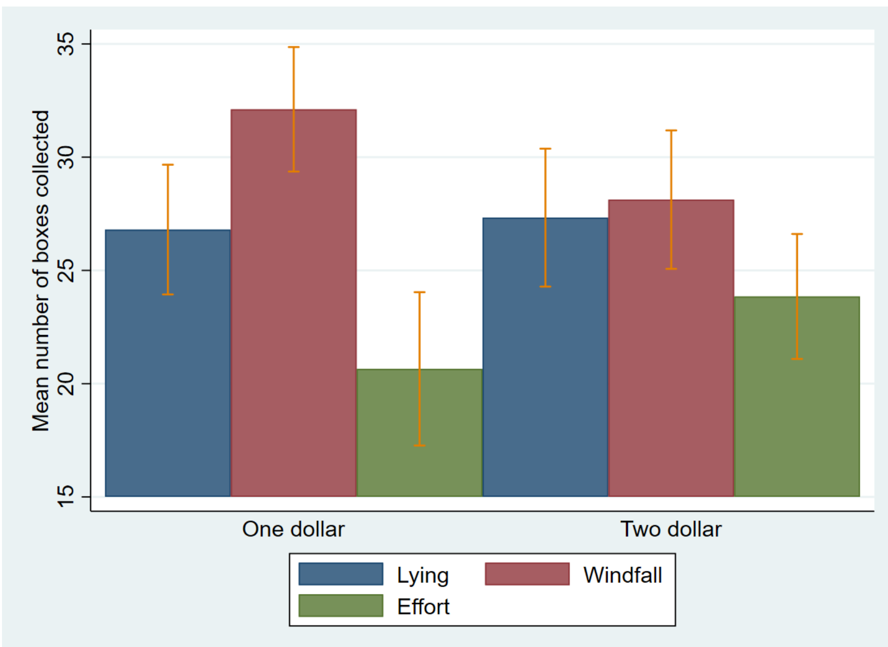
Table A4: Summary statistics ($1 group)

	(1) Lying		(2) Windfall		(3) Effort		(1-2)	(1-3) p value	(2-3)
	Mean	SD	Mean	SD	Mean	SD			
Male (dummy)	0.494	0.501	0.522	0.501	0.521	0.502	0.603	0.656	0.985
Age (years)	44.444	13.816	41.348	13.026	46.298	13.779	0.0254**	0.2003	0.0015***
Spending (1-8)	4.640	2.007	4.592	1.965	4.719	1.955	0.7697	0.7494	0.5376
Education (1-4)	2.944	0.678	2.799	0.659	2.760	0.683	0.0417**	0.0212**	0.5765
SOEP (0-10)	4.500	2.558	4.543	2.698	4.388	2.700	0.8295	0.8258	0.6886
SOEP Fin (0-10)	4.146	2.721	4.163	2.654	3.876	2.701	0.8883	0.4249	0.3482
Household size (1-6)	2.567	1.230	2.696	1.377	2.777	1.423	0.5097	0.2752	0.6579
Income source (0-3)	1.691	0.795	1.728	0.718	1.826	0.641	0.7547	0.2248	0.3153
Employment (1-4)	2.860	0.539	2.891	0.500	2.959	0.436	0.4341	0.1386	0.3890
Understanding (0-9)	2.500	3.495	2.658	3.525	3.421	3.807	0.6342	0.0301**	0.0738*
Observations	178		184		121				

Notes: The p-values reported are from chi-square tests for binary variables and ranksum tests for interval variables.

[8]Number of observations (Lying, Windfall, Effort): $1 group: (178, 184, 121); $2 group: (194, 183, 180).

Figure A1: Number of boxes collected by treatment and endowment level



Notes: Error bars indicate standard errors of the mean.

We performed similar regression analyses as done for the \$2 group. Table A5 reports the marginal effects from the Poisson regression with sample selection, in which the dependent variable is the number of boxes collected in the BRET. In Model 1, the independent variables include the treatment dummies (with the Effort treatment as a reference category). We also controlled SOEP (reported in z-score), and gender.[9] Model 2 replicates model 1, but further controlled for educational attainment and weekly expenditure. Models 3 and 4 replicate models 1 and 2 respectively, but included the interaction terms of treatment dummies and SOEP. The estimated correlation between the selection errors and the outcome errors (ρ) and the Akaike's and Schwarz's Bayesian information criteria (AIC and BIC) are reported for each model.

Table A5: Determinants of risk taking in the BRET (\$1 group)

	(1)		(2)		(3)		(4)	
	ME	St.Err.	ME	St.Err.	ME	St.Err.	ME	St.Err.
Effort	ref.		ref.		ref.		ref.	
Lying	4.205**	(1.748)	7.277***	(0.721)	3.641***	(1.046)	7.181***	(0.774)
Windfall	11.23***	(1.776)	15.60***	(0.810)	10.72***	(1.103)	15.53***	(0.819)
SOEP	5.978***	(0.583)	2.363***	(0.298)	6.410***	(0.537)	2.394***	(0.305)
Male	8.954***	(1.117)	3.456***	(0.658)	8.846***	(1.076)	3.715***	(0.683)
High school			ref.				ref.	
Bachelor			-1.968***	(0.669)			-2.235***	(0.694)
Graduate			-1.643	(1.004)			-2.131**	(0.997)
\$30 - \$49			11.40***	(1.222)			12.19***	(1.429)
\$50 - \$79			11.91***	(1.166)			12.03***	(1.195)
\$80 - \$119			5.762***	(1.045)			5.720***	(1.104)
\$120 - \$174			9.173***	(1.183)			9.221***	(1.110)
\$175 - \$249			7.130***	(1.055)			7.167***	(1.095)
\$250 - \$350			11.77***	(1.217)			11.86***	(1.177)
More than \$350			12.90***	(1.484)			13.31***	(1.735)
N	1040		1040		1040		1040	
ρ	0.15		0.36		0.16		0.37	
AIC	5800.87		5771.86		5798.69		5769.91	
BIC	5894.86		5910.38		5902.57		5918.32	

Notes: The table reports the marginal effects (ME) using Poisson regression with sample selection.
Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

The Wald tests of independent equations indicate that ρ is statistically significant ($p < 0.01$) for all models, confirming that there is selection. Model 1 indicates that honest and lucky individuals collected about 4 and 11 boxes respectively more than the low performers. When further controlling for educational attainment and weekly expenditure, model 2 suggests that honest and lucky individuals collected about 7 and 16 boxes respectively more than the low performers. The difference between the marginal effects of the Lying and Windfall treatments is significant (Wald test, $p < 0.01$). Unlike for the \$2 group, models 3 and 4, which include the interaction terms of the treatment dummies and SOEP, give a very similar estimation as models 1 and 2 respectively. In addition, the values of AIC and BIC of models 3 and 4 (compared to those of

[9] Unlike the \$2 group, inclusion of age does not improve the Information Criteria. Thus, age is excluded in the outcome equation.

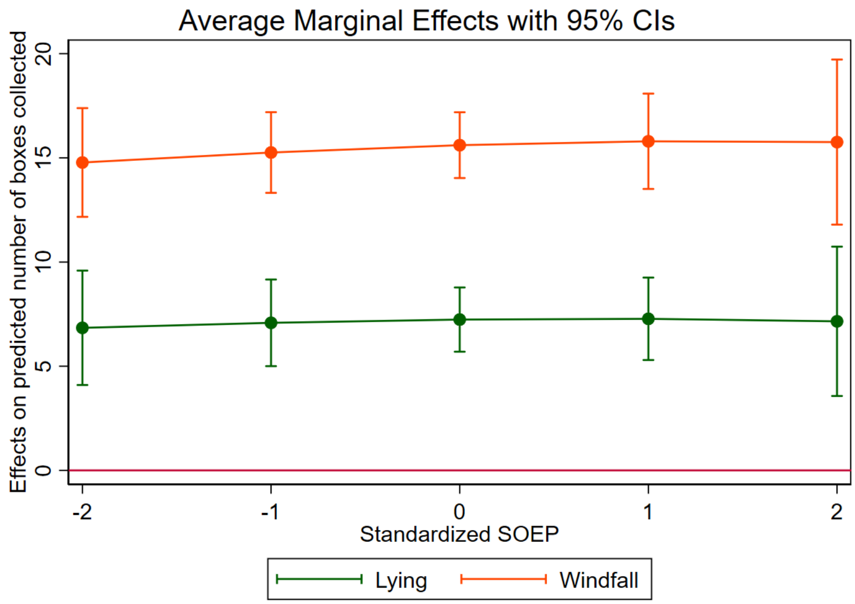


Figure A2: Number of boxes collected by treatment and endowment level

models 1 and 2 respectively) do not change. This implies that the inclusion of the interaction terms does not improve the models, and that individuals of different baseline risk attitudes reacted similarly in the treatments. Figure A2 plots the average marginal effects from model 4 of the treatments (Effort treatment as a reference category) on the predicted number of boxes collected in the BRET for a given level of SOEP (reported in z-score). This figure shows that the marginal effects of the Lying and Windfall treatments do not change for each level of SOEP. We can thus conclude that regardless of their baseline risk attitudes, individuals reacted similarly in the treatments. We discuss these findings below.

Gambling for resurrection: We argue that participants who earned \$1 in the Windfall treatment compensated for having been 'unlucky' in the lottery in Part 1. This interpretation is very likely since unlucky participants ($\text{Mean}_{\text{BRET}} = 32.11$, S.D. $= 18.90$) collected more boxes than the lucky participants ($\text{Mean}_{\text{BRET}} = 28.13$, 20.95). Non-parametric tests confirm the significant difference ($p = 0.0717$, M-W test; $p = 0.001$, KS test). There is no significant difference in SOEP ($p = 0.8199$, M-W test), age ($p = 0.2025$, M-W test) and gender ($p = 0.712$, chi-square test) between lucky and unlucky participants.

Entitlement, discouragement or tiredness?: In the Encoding task, participants would earn \$1 *irrespective* of their performance below the threshold (i.e., 39 words). It may thus be the case that \$1 is perceived as a gift money. If this is so, it should be more prevalent among individuals who did not encode many words in the task. We split the low performers by the median performance (below vs. above median), and performed Poisson regression. Table A6 shows the marginal effects from the regression, in which the dependent variable is the number of boxes collected in the BRET. It can be seen that low performers whose efforts were above the median collected about 4 more boxes than those whose efforts were below the median. This suggests that below median low performers did not perceive their endowment as a gift money. In addition, discouragement may explain why below median low performers took lesser risk than the above median low performers. We can rule out the role of tiredness. Assuming that encoding the words consumes cognition, one may say that subjects in Effort treatment are more tired than those in the Windfall. This is unlikely as the correlation between the number of words solved and the number of boxes collected are very weak (Pearson's Correlation Coeff.= 0.0813 (\$1 group); -0.0372 (\$2 group)).

Compensating for the unethical gain forgone: In the CEO task, participants faced two options- lying or being honest. Those who earned \$1 chose an honest option and gave up the financial gain from lying. This group is very likely to value honesty as they purposely did not choose the lying option in the CEO task. If we believe that they value their honesty, they should think that it is the earning that they truly deserve. Thus, the honest people should perceive \$1 as earned money.

We argue that the difference in the risk taking in the BRET of honest subjects in the Lying treatment and the low performers in the Effort treatment can be explained by the difference in their status quo in Part 1. In the CEO task, honest individuals were presented with the lying option to earn \$2, while low performers had to encode words to reach the threshold to earn \$2. Therefore, honest players *gave up* \$2, while lower performers did not give up anything. This could imply that honest individuals compensated for the unethical gain foregone in the CEO task. Table A7 reports the marginal effects from Poisson regression, comparing honest and dishonest individuals. There is no difference in the risk taking of honest and dishonest individuals. The fact that these honest individuals took as much risk as the dishonest group who earned more may imply that the former compensated for having forgone the financial gain of being dishonest. This effect might not be as strong as how unlucky participants compensated for being unlucky in the lottery (see Table A5 and Figure A2). Honest people *purposefully* chose the honest option (i.e., valuing honesty, being responsible for their own choice), while unlucky people could not control the outcome of the lottery and therefore might wish to take some actions (here collecting more boxes in the BRET) to have more control of the situation. More research is needed to study the behavior of such honest individuals.

Table A6: Determinants of risk taking in the BRET ($1 group: Effort treatment)

	(1)	
	ME	St.Err.
Above median performance	4.122***	(0.882)
SOEP	1.612***	(0.431)
Male	1.005	(0.938)
Age	-0.634	(0.455)
High school	ref.	
Bachelor	-5.003***	(0.981)
Graduate	-2.227	(1.476)
$0 - $29	ref.	
$30 - $49	9.265***	(2.203)
$50 - $79	-7.477***	(1.636)
$80 - $119	0.236	(1.761)
$120 - $174	9.843***	(1.892)
$175 - $249	11.83***	(1.991)
$250 - $350	20.99***	(2.502)
More than $350	5.240***	(2.017)
N	121	

Notes: The table reports the marginal effects (ME) using Poisson regression. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table A7: Determinants of risk taking in the BRET (Lying treatment only)

	(1)	
	ME	St.Err.
Dishonest	-0.790	(0.562)
SOEP	1.508***	(0.287)
Male	4.255***	(0.552)
Age	-2.964***	(0.311)
High school	ref.	
Bachelor	0.436	(0.653)
Graduate	-3.001***	(0.830)
$0 - $29	ref.	
$30 - $49	1.633	(1.361)
$50 - $79	6.276***	(1.262)
$80 - $119	-0.245	(1.111)
$120 - $174	2.502**	(1.152)
$175 - $249	1.601	(1.173)
$250 - $350	6.677***	(1.289)
More than $350	3.038**	(1.339)
N	372	

Notes: The table reports the marginal effects (ME) using Poisson regression. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

D Instruction

[Lying treatment]

Participant information statement
1. What does the study involve?
This study involves several tasks and a short questionnaire. We strongly recommend you complete this study using a computer/laptop or a tablet/Ipad.

2. Who is carrying out the study?
The study is being conducted by Professor Marie Claire Villeval and Sorravich Kingsuwankul from the University of Lyon.

3. How much time does it take?
This study should take approximately 10 to 15 minutes to complete.

4. Can I withdraw from the study?
Participation is voluntary. If you do consent to participate, you can still withdraw from the study at any time without penalty and without having to give any reason. However, there will be no payment in case you withdraw. Withdrawing will not affect the relationship between you, the researchers and Mturk in any way. Once you have completed the study anonymously, your responses cannot be withdrawn.

5. Will anyone else know the results?
All aspects of the study, including results, will be confidential and anonymous. We do NOT ask for your name or any information that will make you identifiable. A report of the study may be submitted for publication, but all information will be used in an aggregated form, and you will never be identified.

6. Will this study benefit me?
By participating in this study, you will receive a flat payment of $0.50, plus an additional payment. This additional payment depends on the decisions you make in the study.

7. Can I tell other people about the study?
The researchers request that for the purpose of maintaining study integrity, you do not share with anybody the nature of the questions asked of you.

8. What if I require further information about the study?
If you have any specific question regarding the study, please contact us via email at kingsuwankul[at]gate.cnrs.fr.

If you agree to our terms, please select 'I agree' and then click 'Next' to continue.

[I agree / I do not agree]

(Next)

Overview

You are now participating in the study. It should take approximately 10 to 15 minutes to complete. We request you not to stop in between. After you finish the study, you will receive a flat payment of $0.50, **plus an additional bonus** depending on the decisions you make during the study within 48 hours. **The exact amount depends on your decisions, so please pay attention.**

Your job today is to perform two tasks and participate in a brief questionnaire.

Please click Next to continue

(Next)

Please respond to the questions

Before we proceed, please respond the questions:

Q.1 How do you see yourself: are you generally a person who is fully prepared to take risk or do you try to avoid taking risks?

Please give a value between 0 and 10, with 0 for "not at all willing to take risk" and 10 for "very willing to take risks":

(Likert scale 0-10)

Q.2 How would you rate your willingness to take risks concerning financial matters?

(Likert scale 0-10)

Please click Next to continue

(Next)

First task

The first task is called 'CEO Task'

Imagine you are the Chief Executive Officer (CEO) of a publicly listed company and one of your tasks is to inform shareholders each quarter about the course of business and the earnings per share. There are two options: announcing 31 cents per share or 35 cents per share. **The higher the announced earnings, the higher will be your compensation as the CEO.** As the

CEO, you know the actual earnings (31 cents per share), but shareholders do not. Shareholders anticipate the announcement of 35 cents as earnings per share, but you know that earnings of 31 cents per share would more accurately reflect the actual number.

The earnings you announce determine how much money you will be paid for this task.

- Announcing 31 cents per share when the actual earnings per share is 31 cents. In this case, you will earn $1.
- Announcing 35 cents per share when the actual earnings per share is 31 cents. In this case, you will earn $2.

Please click Next to continue

(Next)

In the situation described, how many cents of earnings per share will you announce?

- Announcing 31 cents per share when the actual earnings per share is 31 cents. In this case, you will earn $1.
- Announcing 35 cents per share when the actual earnings per share is 31 cents. In this case, you will earn $2.

After making your choice, please, press 'Next' to continue

(Next)

End of the First task

You completed the CEO task. You chose to announce *[choice is displayed here]* cents per share. Therefore, your earning for this task is *[earning associated with choice is displayed here]*.

Please press Next to continue

(Next)

Second task

The second task is called "Grid Task".

You have earned *$[earning of the first task is displayed here]* in the CEO Task. In this second task, $0.50 of this earning is put at stake.

You will see a grid representing 100 boxes, as shown below. The boxes are numbered from 1-100. Starting from the top-left corner.

[Picture of Grid task is displayed here]

The value of each box is $0.03. Your task is to choose how many boxes to collect. So, you will be asked to choose a number between 0 to 100. Boxes will be collected in numerical order.

99 of these boxes are empty, **but** the program has hidden a 'bomb' in one box. You do not know where the bomb lies. You only know that the bomb can be in any box with an equal chance. Moreover, even if you collect the bomb, you will not know it **until the end of the study.**

At the end of the study, the program will randomly determine the number of the box that contains the bomb. **Your earning for this task depends on whether you have collected the box that contains the bomb or not.**

Please click Next to continue

(Next)

There are 2 possible situations.

- If you have only collected empty boxes, you will earn **$0.03 for each box collected.**
- If you have collected the box that contains the bomb, you will earn **nothing from collecting the boxes** and **$0.5 will be deducted** from what you earned in the CEO task (earning of the task is displayed here).

When you choose a number of boxes you would like to collect, you have to write than number twice. Then, the program will display a grid with collected boxes marked. Once you are satisfied with your decision, you have to click 'Confirm' to submit your choice.

Note: If you do not wish to lose any of the earnings in the CEO task, you can choose to collect zero box.

Before the actual task, you will have to respond to some questions and perform a practice round. **This gives you the opportunity to understand the task and how your decision may affect your earnings.** The decision in the practice round does NOT count towards your additional payment. After the practice round, the actual task will begin.

When you are ready, please click Next to proceed to the quiz.

(Next)

Please answer the following question. *[Question appears one by one]*

1. When will you know about the location of the bomb?
    - Immediately when you collect the box that contains a bomb

- At the end of today's study

2. What happens if one of the boxes you collected contains the bomb?
   - Nothing happens
   - You lose all the earnings from the collected boxes
   - You lose all the earnings from the collected boxes and $0.5 is deducted from your earning from the CEO task.

3. Jane decided to collect 25 boxes. What is the chance that Jane find a bomb?
   - 75 chances out of 100
   - 25 chances out of 100
   - 100 chances out of 100

4. John decided to collect 25 boxes. Therefore, the program collected boxes no.1 to 25 for him. At the end of the study, the program randomly determined the location of the bomb, among 100 boxes, and it is behind box no. 52. Did John collect the bomb?
   - Maybe
   - Yes
   - No

Please click Next to continue

(Next)

Practice round

You have completed the quiz about the Grid Task. The next page is a practice, so you can get to know the interface of the task. Your decision in this practice round is NOT counted for any payment.

When you are ready, please, click Next to begin.

(Next)

Practice round

Your decision in this practice round is **NOT** counted for any payment.

[Grid task displayed here]

Please enter the number of boxes that you like to collect

(Input box)

Please enter the same number again

(Input box)

Then, please click ‘Confirm my decision’ to continue.

(Confirm my decision)

Practice round

Your decision in this practice round is **NOT** counted for any payment.

You decided to collect [subject's decision is displayed here] box(es).

- If there is no bomb behind the selected box(es), you would earn (display correct earning here) for this task.
- If there is a bomb behind the selected box(es), you would earn nothing from collecting the box(es) and $0.50 would be deducted from your earning in the CEO task.

[The program displays the grid with the first N boxes collected]

Please, click Next to continue

(Next)

End of the instruction for the Grid Task

This is the end of the instruction for the Grid Task.
On the next page, you will find the actual Grid Task. When you are ready, please press "Next" to begin

(Next)

Grid task

(Grid task displayed here)

Please enter the number of boxes that you like to collect

(Input box)

Please enter the same number again

(Input box)

Then, please click ‘Confirm my decision’ to continue.

(Confirm my decision)

Grid task

You decided to collect (subject’s decision is displayed here) box(es).

- If there is no bomb behind the selected box(es), you earn (display correct earning here) for this task.
- If there is a bomb behind the selected box(es), you earn nothing from collecting the box(es) and $0.50 is deducted from your earning in the CEO task.

[The program displays the grid with the first N boxes collected]

Please, click Next to continue

(Next)

The end of the second task

You have completed the Grid task.

Please, press "Next" to continue.

(Next)

Feedback of the bomb location

You have completed all the tasks in this study!

The program will now randomly determine which box contains a bomb. Each box is equally likely to contain the bomb.

- If you collected the bomb, a red bomb will be shown.
- If you did <u>**NOT**</u> collect the bomb, a black bomb will be shown.

Then, you will answer a brief questionnaire. At the end, the program will summarize your compensation for today’s study.

Please press Next to continue.

(Next)

Your decision in the Grid Task

You decided to collect (subject's decision is displayed here) box(es).
[The program displays the grid with the first N boxes collected]

Please, click 'Reveal bomb' to continue.

(Reveal bomb)

[If subject did not collect the bomb]

Your decision in the Grid Task

You decided to collect (subject's decision is displayed here) box(es). The bomb was behind box number (display bomb location here). You did not collect a bomb. Therefore, you earned (display earning for Grid Task here) for this task.

[Grid is displayed with a black bomb in one of the boxes not collected]

Please, click Next to continue.

(Next)

[If subject collected the bomb]

Your decision in the Grid Task

You decided to collect (subject's decision is displayed here) box(es). The bomb was behind box number (display bomb location here). You collected a bomb. Therefore, $0.50 is deducted from your earning in the CEO Task.

[Grid is displayed with a red bomb in one of the boxes collected]

Please, click Next to continue.

(Next)

Final questionnaire

Please provide the following information.

1. What year were you born? (e.g. 1980)
2. What is your gender?

- Male
- Female

3. What is your status?
    - Student
    - Unemployed
    - Employed or self-employed
    - Pensioner
    - Others: please indicate
4. What is the main source of personal finance?
    - Allowance and/or social benefits
    - Salary
    - Pension
    - No personal income
5. What is the size of your household?
    - I live alone
    - 2 persons
    - 3 persons
    - 4 persons
    - 5 persons
    - More than 5 persons
6. What is the highest education degree obtained?
    - Below high school
    - High school
    - Bachelor's or college degree
    - Master's/graduate degree and above
7. What is your approximate household annual pre-tax income?
    - Less than $10,000
    - Between $10,000 and $20,000
    - Between $20,000 and $30,000
    - Between $30,000 and $50,000
    - Between $50,000 and $70,000
    - Between $70,000 and $90,000

- Between \$90,000 and \$110,000
- Between \$110,000 and \$130,000
- Between \$130,000 and \$150,000
- More than \$150,000
- I prefer not to say

8. How much money do you spend in a typical week? This should include your daily expenditure such as food, travel, mobile charges, purchases, EXCLUDING rent, mortgage, educational fee, work expenses.

   - \$0 - \$29
   - \$30 - \$49
   - \$50 - \$79
   - \$80 - \$119
   - \$120 - \$174
   - \$175 - \$249
   - \$250 - \$350
   - More than \$350

9. Which device are you using to respond to this study?

   - Computer/laptop
   - Ipad/tablet
   - Smartphone

10. How easy was it for you to understand the descriptions of the tasks in this study? Please give a value between 0 and 9, with 0 for "not confusing/easy to understand" and 9 for "confusing/hard to understand":

    (Likert scale from 0 to 9)

11. What will you get as additional payment today?

    - Chocolate bar
    - Gift card
    - Money

12. In what currency will you be paid for this study?

    - Swiss Franc
    - US dollar
    - Thai Baht

(Next)

The end of today's study

Thank you! You have completed today's study.

Here is the summary of your total compensation for participating in today's study.

- Flat payment for participation: $0.50
- Your earnings in the CEO task: (display amount here)
- Your earnings in the Grid Task: (display amount here)

Thus, a total of (display total amount here) will be posted to your MTurk Account within 48 hours.

Please, press "Next" to continue.

(Next)

The end of the study

Thank you for taking time out of your busy life to participate to this study. If you have any questions concerning this study, you can contact us at kingsuwankul[at]gate.cnrs.fr.

Your confirmation code to be entered on Mturk webpage is your Mturk worker ID. Please make the HIT on Mturk with this ID.

You can close this window now.

[Windfall treatment: Part 1 only]

Information

You will be receiving an amount of money as an endowment. You are receiving **either $1 or $2 with an equal chance**. The program will determine the exact amount you will receive, which does not depend on your decisions.

When you press 'Next', the program will determine the exact amount of your endowment.

(Next)

The program has determined the amount for you.

Your endowment is [amount of endowment is displayed here].

Please, press ‘Next’ to continue.

[Effort treatment: Part 1 only]

First task

The first task is an encoding task.

You will be presented with a number of words and your task will be to encode these words by substituting the letters of the alphabet with numbers using the following table:

[Table with letter-number codes is displayed here]

Example:
You are given the word **FLAT**. The letters in the table above show that F=6, L=3, A=8, and T=19. You will have to enter these numbers into boxes corresponding to the respective letters of the word.
Once you encode a word correctly, the program will prompt you with another word to encode. You will have **8 minutes** to encode as many words as you want. After 8 minutes, the task is ended automatically.

Your earnings for this task:

- If you correctly encode fewer than 39 words, you will earn $1.
- If you correctly encode 39 words or more, you will earn $2.

When you are ready, please press Next to start the task.

(Next)

Remaining time: *[Remaining time in seconds displayed here]*

[Table with letter-number codes is displayed here]

So far, you have encoded [Number of words completed displayed here] word(s) correctly.

[Table with words to encode is displayed here]

You will earn $2 for this task if you encode at least **39 words**. Otherwise, you will earn $1.

[Screen is auto-incremented when time limit is reached]

End of the first task

You completed the encoding task. You correctly encoded (No. of words done is displayed here) word(s). Thus, you earned $(earning is displayed here) for this task.

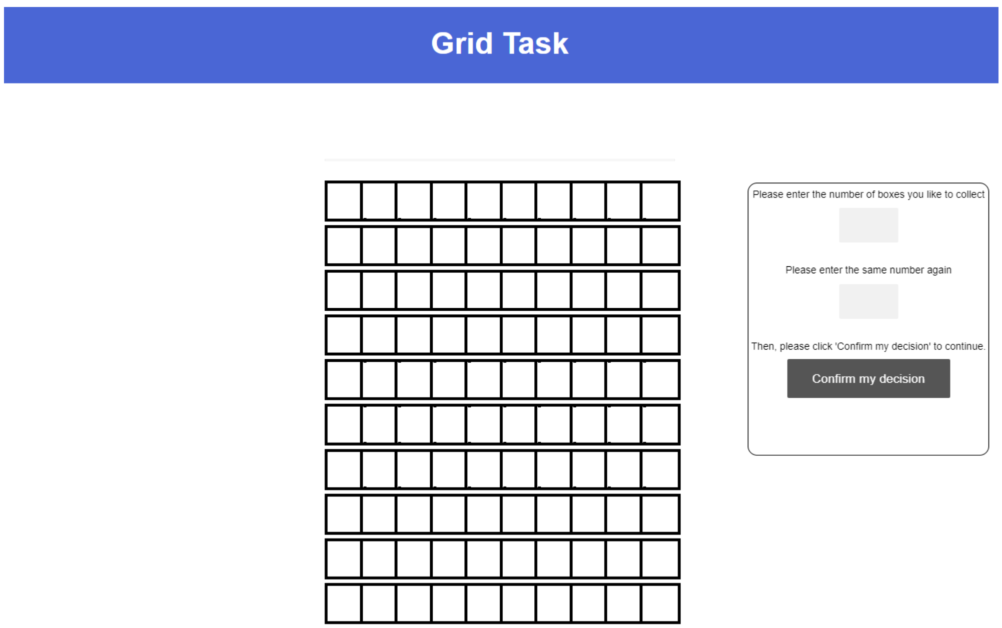


Figure A3: Grid task (before making decision)

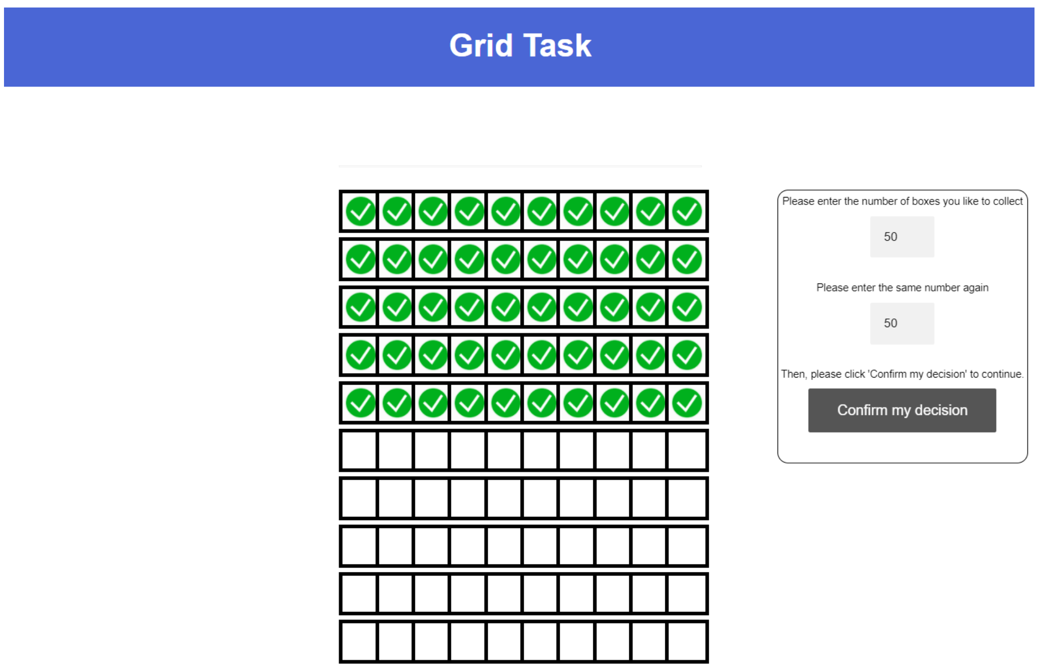


Figure A4: Grid task (after making decision)

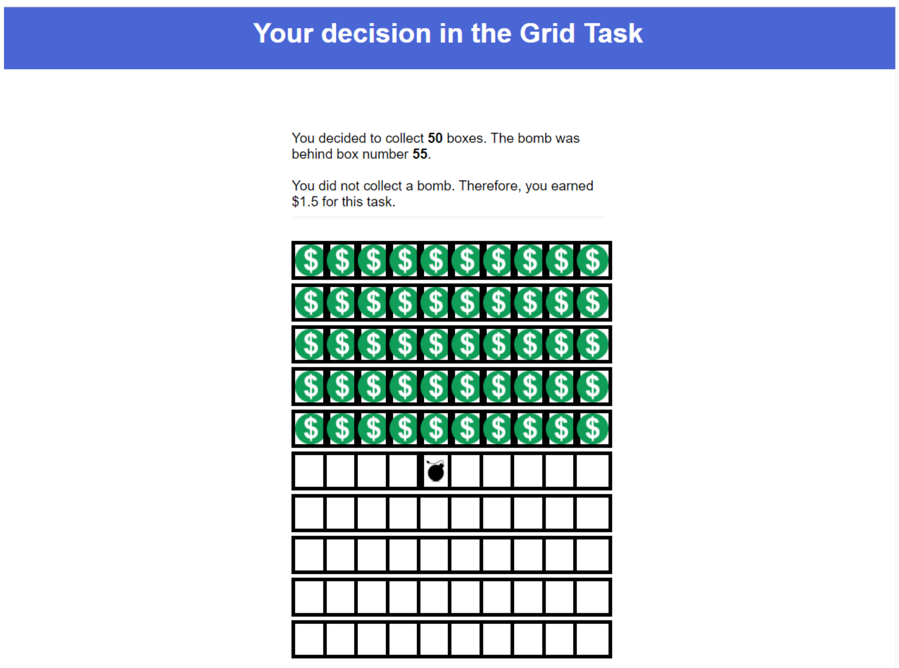


Figure A5: Feedback of Grid task (if subject did not collect the bomb)

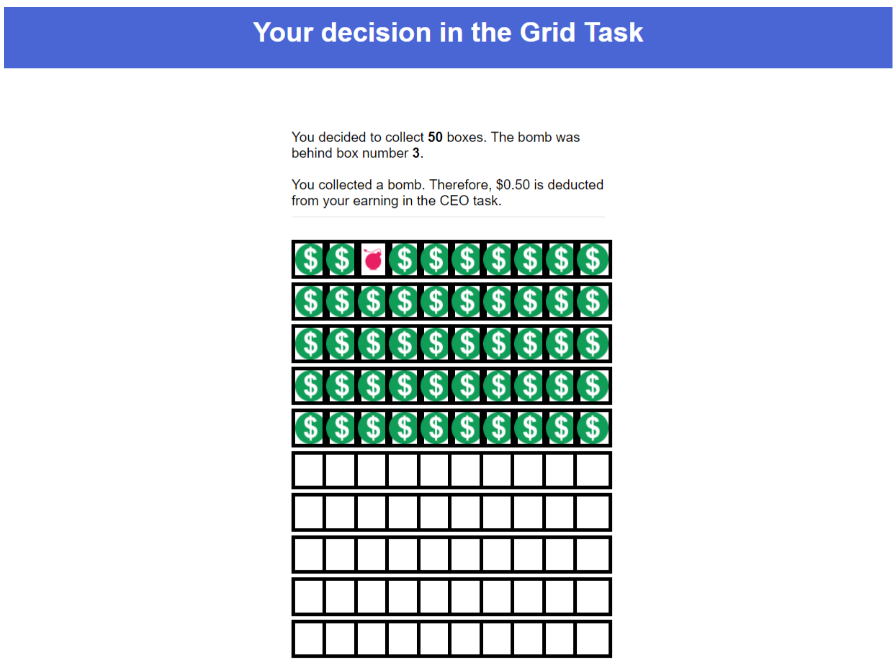


Figure A6: Feedback of Grid task (if subject collected the bomb)

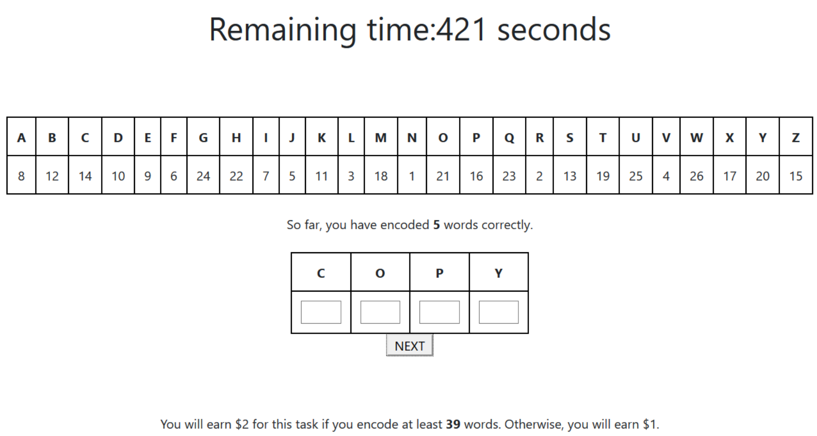


Figure A7: Encoding task