

Konrad, Kai; Lohse, Tim; Simon, Sven

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Deception under Time Pressure: Conscious Decision or a Problem of Awareness?*

Kai A. Konrad[†] Tim Lohse[‡] Sven A. Simon[§]

February 27, 2017

Abstract

Time is a crucial determinant of deception, since some misreporting opportunities come as a surprise and require an intuitive decision while others allow for extensive reflection time. This paper provides experimental evidence on the role of the time dimension for dishonest decision-making. We conduct a laboratory experiment of self-serving deceptive behavior and exogenously vary the level of reflection time. We find that time pressure leads to more honesty compared to sufficient contemplation time. Moreover, dishonest subjects need more response time compared to honest subjects. In addition, we decompose misreporting into two components: first, the cognition process of the misreporting opportunity and, second, the conscious decision to misreport. This decomposition reveals that more reflection time increases awareness of the misreporting opportunity. However, it has no effect on the conscious decision of whether to misreport or not. Due to subjects' lack of awareness under time pressure we conclude that misreporting is not the intuitive response.

Keywords: time pressure, contemplation, cognitive process, awareness, misreporting, dishonesty, laboratory experiment

JEL classification: C91, D83, K42

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[†]Max Planck Institute for Tax Law and Public Finance

[‡]Berlin School of Economics and Law; Max Planck Institute for Tax Law and Public Finance

[§]Max Planck Institute for Tax Law and Public Finance

1 Introduction

Misreporting opportunities are common in everyday life. Some opportunities allow for a reflective decision while others come as a surprise and require an intuitive response. On the one hand, think of the problem of declaring taxable income or declaring the size of the monetary loss to an insurance company after a burglary. These problems leave plenty of time for consideration. On the other hand, picture a sudden control by customs at the airport when leaving the baggage claim area (Konrad et al. 2016) or a spontaneous decision to accept an excessive change (Azar et al. 2013). Here, time is always a crucial factor since dishonest activities involve coping with a trade-off between the associated costs and benefits. Benefits of a dishonest report are oftentimes immediate material or reputational gains. Costs may have not only a monetary dimension (such as fines) but also a psychological dimension due to violations of internal norms causing a bad conscience that dampens the utility of the material gain.¹ Thus, finding the optimal solution to this trade-off is a complex and potentially cognitively demanding task. Subjects might fail at this task under cognitive constraints such as time pressure. The issue is especially tricky if the misreporting decision is preceded by a timely cognition process to recognize the opportunity to misreport at all. The longer this cognition process takes, the less time there is to balance the costs and benefits of the actual report. In turn, the resulting intuitive response under time pressure might be driven by the most present cost or benefit only.²

In this paper, we use an innovative setting to shed light on this topic. We study a laboratory experiment of self-serving deceptive behavior which combines two distinct levels of reflection time with a cognition process about the opportunity to misreport. We ask the following research questions: first, what impact does time pressure have on misreporting behavior compared to a decision made with sufficient reflection time? Second, given the fact that there are two crucial components of dishonest reporting – namely, the cognition of the misreporting opportunity and the conscious decision to misreport – which of these two requires more (of the scarce) time?

Our results are as follows. Comparing reporting behavior under time pressure with behavior with sufficient reflection time shows that time pressure has a large impact on the share of misreports: the number of dishonest reports significantly decreases by more than one third. Moreover, analyzing the timing of reports made under time pressure reveals that dishonest reports, on average,

¹The literature on deception has identified a variety of crucial behavioral aspects such as guilt aversion (Charness and Dufwenberg 2006), an aversion to lying (Lundquist et al. 2009, Cappelen et al. 2013), the behavioral differences depending on the type of lie (Erat and Gneezy 2012), the positive relationship between creativity and dishonesty (Gino and Ariely 2012) or the role of emotions (Coricelli et al. 2010).

²The underlying dynamics of misreporting in different environments might thus be captured best by Kahneman’s (2011) dual framework of decision-making. “System 1” is responsible for quick, intuitive decision-making and requires (almost) no cognitive effort. Typically, decisions made under time pressure are “System 1” decisions and are based on heuristics. In contrast, “System 2” choices show an in-depth evaluation of problems and lead to reflective decisions.

require 10 percent more time than honest reports. More specifically, the distribution of dishonest reports over time first-order stochastically dominates the distribution of honest reports over time. For the decomposition of the misreporting process, our results suggest that the differences between the decisions made under time pressure and the ones with extensive reflection time can be attributed entirely to different levels of subjects' awareness of the misreporting opportunity. Restricting the analysis to those subjects who are aware of the misreporting opportunity and therefore make a conscious decision to misreport reveals that the fraction of dishonest reports is the same under time pressure and with sufficient reflection time. This finding highlights the importance of the cognition process that leads to awareness, a component that has received only limited attention in the literature so far.

The next section briefly reviews the related literature. Section 3 explains the experimental set-up and states our hypotheses. Section 4 provides an analysis of the experimental data. Section 5 discusses our results and section 6 concludes.

2 Related Literature

The main contribution of our paper relates to the experimental literature on dishonest decision-making under time constraints.³ In general, the impact of time constraints on decision making has only recently found itself in the spotlight of economic research. For example, various studies test the relationship between reaction times and cooperation in social dilemmas (e.g., Rand et al. 2012, Rand et al. 2014, or Stromland et al. 2016; for an overview, see Spiliopoulos and Ortmann 2016). By varying the available reflection time exogenously, one can identify behavior as either an intuitive response or as the result of a reflective process. This topic has also received growing attention in the experimental and behavioral literature on deception. Greene et al. (2009) inform us that misreporting takes more time and, hence, is not the intuitive choice. In contrast, Shalvi et al. (2012) use a modified version of the dice rolling experiment (Fischbacher and Föllmi-Heusi 2013) to address the effect of an exogenous introduction of time pressure on cheating. They find clear evidence of misreporting under time pressure, but less clear-cut evidence with unconstrained reflection time. Although there is a controversy as to whether participants were able to make up their mind on the decision prior to the actual report (Foerster et al. 2013 and Shalvi et al. 2013), the main insight provided by Shalvi et al. is that cheating is the automatic response. Gunia et al. (2012) also manipulate the time dimension by introducing an enforced contemplation period into a sender-receiver framework with honest and dishonest messages in the style of Gneezy (2005). Their results point in the same direction as Shalvi et al. since enforced reflection time leads to less dishonest behavior. However, the compa-

³From a broader perspective, we contribute to the literature on the role of cognitive constraints (e.g., Mead et al 2009, Gino et al. 2011, and van't Veer et al. 2014) and deliberation (Zhong 2011) on dishonest decision-making, which is surveyed by Bereby-Meyer and Shalvi (2015).

rability of both settings is limited due to potential harm to other subjects and strategic truth-telling (Sutter 2009). The crucial novelty of our approach is the rigorous implementation of the time dimension. Our setting has a binding time restriction for the report made under time pressure and also for the report with sufficient reflection time. This procedure prevents the undesirable self-selection of subjects into one time dimension and hence enforces intuitive versus reflective decision-making by design. Moreover, we ensure the validity of the results in the time pressure treatment by excluding any possibility to anticipate the misreporting opportunity in advance.

Additionally, we contribute to the literature that takes account of the multidimensionality of dishonest decision-making. Misreporting involves multiple steps, for example, the cognitive process that leads to awareness of the misreporting opportunity, the actual decision to misreport, and the construction of a credible dishonest report. While all steps potentially require cognitive resources, ignorance of the misreporting opportunity avoids the subsequent steps and hence automatically leads to a truthful report. Gino et al. (2009) vary the saliency of the cheating option and find a decrease in cheating rates when a (fake) participant explicitly asks for permission to cheat in the presence of other subjects. In contrast, Fosgaard et al. (2013) use a more subtle procedure and show that facilitated understanding increases the share of dishonest reports by women. Walczyk et al. (2003) focus on the second and third step and find that the construction of a lie increases the reaction time of subjects. Our contribution to this literature strand is the isolation of the cognition process from the conscious decision to misreport, which enables us to identify the point of impact of time pressure on the misreporting process.

3 The Experiment

3.1 Design

The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007). Sessions took place at the econlab in Munich from December 2015 to April 2016. The pool of participants consisted of local Munich university students who were recruited using ORSEE (Greiner 2004). A total number of 411 subjects (average age, 22.9; average payoff, 13.8 EUR; 48 percent female participants) from various fields participated in the experiment. On average, a session lasted for 30 minutes and had 11 participants. The experiment was a one-shot game with two treatments, namely the ‘Contemplation Treatment’ and the ‘Time Pressure Treatment.’ We applied a between-subjects design. Throughout the experiment, care was taken that participants remained anonymous and did not exchange views or learned of other subjects’ monetary payoffs neither during the experiment nor at the end of the experiment when payments were made.

Each participant was seated in a private cubicle at a computer. Some introductory screens provided the general instructions. An initial mock decision

made them familiar with the technical choice of alternatives. Then, participants drew an individual income from a computerized private lottery shown as a binary wheel of fortune. Participants had an 80 percent chance of drawing a low income (400 Experimental Currency Units [ECU] = 4 EUR) and a 20 percent chance of drawing a high income (1000 ECU = 10 EUR). Probabilities were common knowledge. In both treatments the participants' task was to report their income simply by clicking either a button with 400 ECU or with 1000 ECU. To address the potential problem of availability bias, the final lottery result was only shown for four seconds. Since their (final) income report was the only determinant of their payoff, participants with a low income had a monetary incentive to misreport their lottery result.⁴ Participants were informed that no individual screen was observable to the laboratory staff. However, the computer system registered the true incomes from the lottery and the actual reports. Figure 1 illustrates the structure of the experiment graphically.⁵

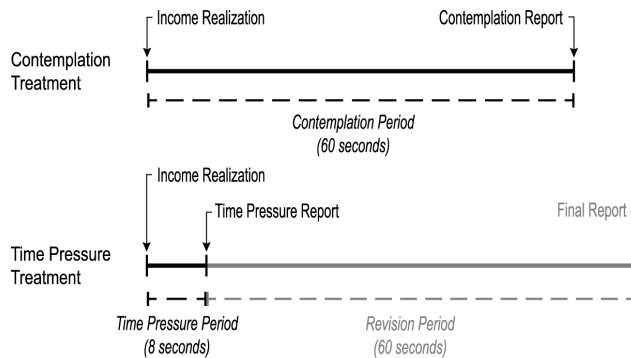


Figure 1: Structure of the experiment

The two treatments differ with respect to the available time to make the individual reporting decision after getting to know the outcome from the lottery. In the Contemplation Treatment (CT) subjects read that they now had a fixed 60-second time period to think about the reporting decision and that only their report determined their payoff. After the 60 seconds had elapsed, participants

⁴The experiment was displayed on two monitors: a main monitor (center) and a notebook monitor (on the right). The notebook monitor only displayed the income-generating lottery and was a blank screen otherwise. This procedure physically separated the learning of the individual income from the actual reporting process. Thus, it should be even more obvious that there was room for misreporting.

⁵This paper is part of a larger research project which originally involved a second treatment dimension. The purpose of this dimension was to evaluate the effect of social cues on the stimulation of certain heuristics. Specifically, we displayed a picture of a treetop (baseline) and a picture of human eyes (treatment) in the upper part of the monitor. As there was no significant treatment effect along this dimension, we dropped it and pooled the respective data for this paper. Thus, we can focus entirely on the first dimension, namely the existence of time pressure. For detailed instructions and screenshots, see supporting information online.

made their report. Hence, participants had sufficient reflection time for their decision. We refer to this report as the ‘contemplation report.’ In the Time Pressure Treatment (TPT), an initial income report had to be made under time pressure: participants read that they now had only eight seconds to report their income and that their report determined their payoff. This procedure made the reflection time of eight seconds a binding time constraint. We refer to this report as the ‘time pressure report.’ Failure to give a report on their income led to a payoff of zero and to an exclusion from the analysis.⁶

It is important to notice that before reaching the contemplation period in CT or the time pressure period in TPT, respectively, participants knew neither the structure of the experiment in general nor that they would be asked to state the outcome of their private lottery. Hence, they were not able to anticipate the reporting decision. They could not make up their mind in advance on whether they wanted to misreport or state their income truthfully. In our subsequent analysis we will compare subjects’ declaration behavior without time pressure in CT to behavior under time pressure in TPT. Focusing on the contemplation reports versus the time pressure reports in CT and TPT, respectively, will allow us to disentangle two effects: on the one hand, the cognition process of becoming aware of the possibility to misreport, and on the other hand, the conscious deception decision which involves trading off the costs and benefits of misreporting.

Immediately after the completion of the main experiment, we conducted a questionnaire concerning the experimental setting. Specifically, we asked subjects about their awareness of the misreporting opportunity of the respective report. The questionnaire was followed by several post-tests such as the Cognitive Reflection Test (Frederick 2005) to identify impulsive and reflective subjects. In the post-test section, subjects were able to earn an additional 300 ECU = 3 Euro. Each session concluded with two additional questionnaires, namely the Short Dark Triad (Jones and Paulhus 2014) and socio-economic questions.

3.2 Hypotheses

Misreporting is a complex and cognitively demanding task that consists of several steps and dimensions. The first and essential step is the cognition of the misreporting opportunity, which depends both on its apparentness and the possibility of a prior anticipation. For example, it is almost common knowledge that the filing of the tax declaration allows for misreporting. However, finding potential loopholes or possibilities to hide one’s income is much more complex. Hence, the opportunity to evade taxes can be anticipated, but is in most circumstances not very evident. In contrast, people sometimes face unexpected

⁶In TPT the time pressure period was followed by an enforced revision period (displayed in gray in Figure 1): participants read on the main monitor that there was a break of 60 seconds until the experiment continued and that they could revise their time pressure report after the break. After the 60 seconds had elapsed, participants made their final report by clicking on one of the two income buttons, which determined their payoff. The final report in TPT is of no help in shedding light on our research questions since informational circumstances in this second decision are different.

questions in their personal or professional life, such as whether a forgotten or overdue task has already been completed. Here, the misreporting opportunity is apparent. But the lack of anticipation might lead to its ignorance. The latter case also matches the situation of subjects in our experiment, since the opportunity is easy to understand but comes as a surprise in TPT.

The subsequent step is a careful evaluation of costs and benefits and the conscious decisions of whether to misreport or not. While the benefit of a dishonest report is an immediate material gain in our setting, there are several potential costs of misreporting. These may include, among others, fear of an audit, an uncomfortable situation when receiving the payoff from the laboratory staff or the violation of internal norms. Since there are no audits and we ensure complete confidentiality of subjects' actions, the monetary incentive of misreporting should dominate countervailing incentives for the majority of subjects. The trade-off leading to this insight requires sufficient reflection time, which is not available under time pressure. However, a dishonest report without a proper trade-off between costs and benefits is a risky choice, as it might rely only on the most present cost or benefit. Hence, we expect that most subjects are honest under time pressure.

Hypothesis 1 *Honesty is the default option for most subjects. Thus, time pressure leads to less dishonest reports.*

The next stage of our analysis is to separate the impact of time pressure on the cognition process of the misreporting opportunity from its impact on the conscious decision to actually misreport. As discussed, both steps might require considerable reflection time depending on the respective situation or framework. In our setting, the misreporting opportunity cannot be anticipated. To gain awareness of the misreporting opportunity, subjects only need to overcome their initial surprise of being in a reporting situation. Moreover, subjects know that their payoff is determined solely by their report. The misreporting opportunity, thus, should be apparent and is easy to understand since it only involves clicking on the button that displays the high income. Therefore, we expect that the majority of subjects are able to complete this step even under time pressure. In contrast, the conscious trade-off between costs and benefits should take more time and is only feasible under sufficient reflection time. The evaluation of costs is especially time-consuming, since subjects might imagine different scenarios and weigh their consequences. For example, some subjects might be suspicious of a (non-existing) audit or a loss of their reputation due to a dishonest report. Assigning a low or zero probability to both costs might not be the initial reaction, and hence requires time. Finally, overcoming intrinsic values that prevent misreporting as an intuitive decision might also be time-demanding.

Hypothesis 2 *It is the conscious trade-off between costs and benefits that requires reflection time and leads to less dishonest reports under time pressure.*

4 Experimental Results

4.1 Overall misreporting by treatments

For our analysis, we focus on the group of potential deceivers, which are defined as subjects that draw a low income and make their report within the time limit. This leaves us with 305 subjects in total, of which 117 subjects are in CT and 188 subjects are in TPT. A total of 32 subjects in TPT were not able to make a report within eight seconds, which indicates that the time pressure was sufficiently high.⁷

We start our analysis with overall misreporting behavior, addressing the question of whether time pressure decreases the share of dishonest reports. Figure 2 displays the fraction of subjects that misreport a high income based on their low lottery result in CT and TPT, respectively. In line with our hypothesis, 35 percent untruthfully report a high income with sufficient reflection time while only 23 percent dishonestly report a high income under time pressure. This difference is significant (χ^2 -Test: $p = 0.02$) and shows that time pressure decreases the share of dishonest reports by more than one third.

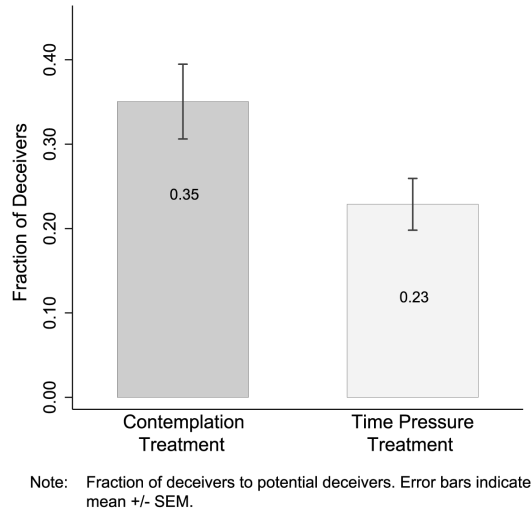


Figure 2: Overall misreporting by treatment

⁷We find no major differences in the characteristics of the group of non-responders and the group of those that responded on time. In particular, the level of awareness of the misreporting opportunity is comparable in both groups.

Table 1: Multivariate analysis of misreporting

VARIABLES	(1)	(2)	(3)	(4)
Time Pressure	-0.122** (0.0539)	-0.138** (0.0539)	-0.143*** (0.0536)	-0.142*** (0.0535)
Cognitive Reflection Test			0.0294 (0.0237)	
Machiavellianism				0.0110** (0.00535)
Constant	0.350*** (0.0443)	0.0818 (0.228)	0.0138 (0.239)	-0.260 (0.278)
Socio-Economic Controls	NO	YES	YES	YES
Observations	305	305	305	305
R ²	0.018	0.039	0.044	0.051

Notes: The dependent variable is the fraction of deceivers to potential deceivers. Time Pressure is a binary variable that is 1 for TPT and 0 for CT. Cognitive Reflection Test is the number of questions solved (0 to 3) and Machiavellianism is the score in the respective section of the Dark Triad (9 to 45). Ordinary least squares (OLS); robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

This estimate is confirmed by a multivariate analysis of misreporting (Table 1). For better comprehensibility, we report the results of an OLS regression, which are in line with the results of an (unreported) probit regression. The dependent variable is the share of dishonest reports and the reference group is CT for all specifications. The coefficient on the time pressure dummy is significant in both base specifications (with/without socio-economic control variables, columns (1) and (2))⁸ and decreases the share of dishonest reports by 12 to 14 percentage points. Contradicting previous literature (Shalvi et al. 2012 and Gunia et al. 2012), we find that misreporting is not the intuitive choice but is the outcome of a reflective process that requires time.

In an extended specification (column (3)), we include the performance in the Cognitive Reflection Test (Frederick 2005) as an indicator of reflective thinking, which might be related to the ability to misreport. So far, there is contradicting evidence on the relationship between reflective thinking and dishonest behavior (Fosgaard et al. 2013 and Ruffle and Tobol 2016). For overall misreporting, we find no significant effect of reflective thinking on misreporting. In contrast, subjects with Machiavellian traits (higher scores in the Machiavellianism section of the Short Dark Triad (Jones and Paulhus 2014)) have a significantly higher probability of misreporting (column (4)). This fits well with the concept of

⁸Except for the number of siblings, none of the socio-economic control variables has a significant effect on misreporting.

Machiavellianists who deceive for material gain, but only when potential costs are limited and it is thus beneficial to do so.⁹ We summarize our main finding as follows:

Result 1 *Time pressure decreases the share of dishonest reports by more than one third.*

4.2 Response time in the Time Pressure Treatment

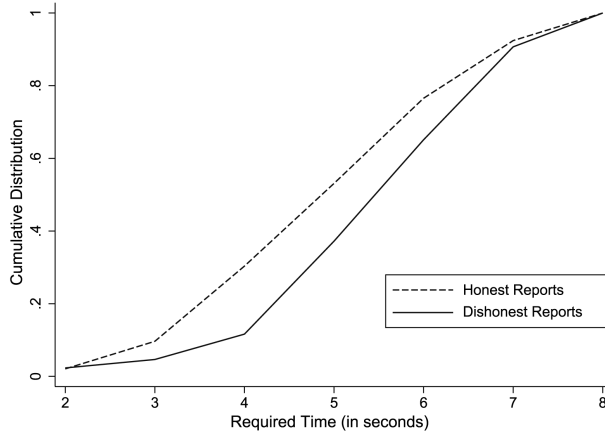


Figure 3: Cumulative distribution of the required response time in TPT

Table 2: Test statistics for response time under time pressure

Test	Test Statistic	p-value
Homogeneity of Variances:		
Levene's Test	1.912	0.168
Brown-Forsythe Test	1.654	0.200
Equality of Distribution:		
Wilcoxon Rank-Sum Test	2.209	0.027
Kolmogorov-Smirnov Test	0.187	0.098

To shed further light on the question of whether honesty is the intuitive response, we analyze the required time of subjects *during the Time Pressure Period of TPT*, i.e., reporting behavior during the eight-second time frame. If misreporting indeed takes more time due to the cognition process and the balancing of costs and benefits, we should observe that honest subjects need less time than dishonest subjects. Figure 3 plots the cumulative distribution of the

⁹For a discussion, see Jones and Paulhus 2014.

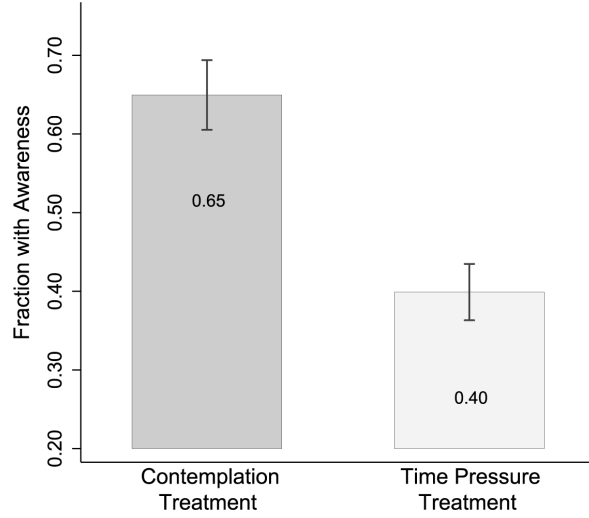
response time of honest and dishonest subjects. A first inspection reveals that the distribution of response time for dishonest subjects first-order statistically dominates the distribution for honest subjects, i.e., it takes longer to make an untruthful report. On average, dishonest subjects (5.88 secs) need 10 percent more time than honest subjects (5.36 secs). The significance of these findings is confirmed by a number of non-parametric tests (Table 2). Since we are not able to reject the null hypothesis of the homogeneity of variances (Levene’s test, Brown-Forsythe test), we apply the Wilcoxon rank-sum test and find that the difference between both groups is significant: a random honest subject is 61 percent more likely to need less time than a random dishonest subject. Finally, the marginal significance of the Kolmogorov-Smirnov test on the equality of distributions (one-sided version) completes the picture. Hence, the analysis of required response time in the TPT further supports our hypothesis that honesty is the default response for the majority of subjects. Our main finding from this section is:

Result 2 *Dishonest subjects need 10 percent more time than honest subjects in the Time Pressure Treatment.*

In sum, results 1 and 2 provide strong evidence for our hypothesis 1 that misreporting is not the intuitive choice but rather requires sufficient reflection time.

4.3 Awareness of the misreporting opportunity

In the following two subsections we decompose the process of misreporting into the cognition of the misreporting opportunity and the conscious decision after the trade-off between costs and benefits. Both steps are crucial for misreporting, but might be affected differently by time pressure. We start with the analysis of time pressure on the cognition process of the misreporting opportunity (awareness) and continue with the second step, the conscious decision to misreport or to tell the truth.



Note: Fraction of potential deceivers with awareness of the misreporting opportunity. Error bars indicate mean \pm SEM.

Figure 4: Awareness of the misreporting opportunity by treatment

Table 3: Multivariate analysis of awareness of the misreporting opportunity

VARIABLES	(1)	(2)	(3)	(4)
Time Pressure	-0.251*** (0.0569)	-0.259*** (0.0581)	-0.275*** (0.0567)	-0.260*** (0.0582)
Cognitive Reflection Test			0.0847*** (0.0252)	
Machiavellianism				0.000753 (0.00621)
Constant	0.650*** (0.0443)	0.410* (0.247)	0.214 (0.254)	0.387 (0.315)
Socio-Economic Controls	NO	YES	YES	YES
Observations	305	305	305	305
R ²	0.059	0.073	0.104	0.073

Notes: The dependent variable is the fraction of potential deceivers that are aware of the misreporting opportunity. Time Pressure is a binary variable that is 1 for TPT and 0 for CT. Cognitive Reflection Test is the number of questions solved (0 to 3) and Machiavellianism is the score in the respective section of the Dark Triad (9 to 45). Ordinary least squares (OLS); robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Figure 4 displays the fraction of potential deceivers that are aware of the misreporting opportunity in CT and TPT, respectively. While nearly two-thirds of subjects are aware of the misreporting opportunity in CT, only 40 percent report being aware in TPT. This difference is highly significant (χ^2 -Test: $p = 0.00$) and suggests that time pressure reduces awareness of the misreporting opportunity by 39 percent (or 25 percentage points). This estimate is confirmed by a regression analysis with awareness as the dependent variable (Table 3). In both base specifications (columns (1) and (2)), time pressure significantly reduces the level of awareness. Hence, subjects need considerable reflection time to overcome their surprise of the reporting situation and to identify the misreporting opportunity. This result is not consistent with our second hypothesis, that it is mainly the conscious decision to misreport which requires reflection time and not the process of cognition. However, it highlights the importance of this first step of misreporting and shows that the majority of subjects do not have the concept of deception intuitively in mind. This finding is confirmed in the group of subjects that draw a high income and have neither an incentive to misreport on their lottery result nor on the question concerning the awareness of the misreporting opportunity. Hence, this group can be considered as a control group. While 61 percent are aware of the misreporting opportunity in CT, only 43 percent report being aware in TPT.¹⁰

In contrast to the macro view on misreporting, the decomposition into two steps reveals that reflective thinking is related to a better ability to recognize the misreporting opportunity. The highly significant coefficient of the performance in the Cognitive Reflection Test in our alternative specification (column (3)) suggests that the likelihood of gaining awareness is 25 percentage points higher for a subject that answers all three questions correctly (reflective thinkers) compared to a subject that answers none of the questions correctly (impulsive thinkers). Machiavellian traits have no significant influence on the awareness of the misreporting opportunity (column (4)). In combination, both findings suggest that awareness is related to reflective thinking, independent of the moral attitude as captured by the Machiavellian section of the Dark Triad. We summarize our main findings concerning awareness as follows:

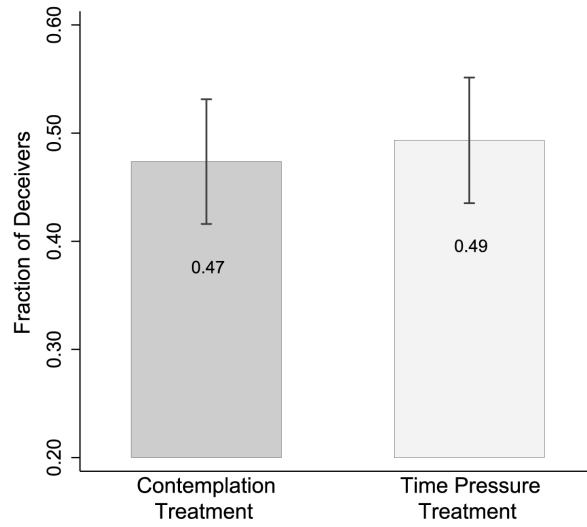
Result 3 *Subjects need considerable reflection time to gain awareness of the misreporting opportunity. Time pressure reduces awareness by nearly 40 percent.*

4.4 The conscious decision to misreport

After analyzing the cognition of the misreporting opportunity as the necessary condition for misreporting, we restrict our attention to subjects that consciously made the trade-off between honest and dishonest reporting. This restriction

¹⁰A further analysis also finds no evidence of an inconsistency in answers to the non-incentivized awareness questions. A high percentage of dishonest subjects is aware of the misreporting opportunity for the respective report. Moreover, awareness in the final report as an implication of awareness during the time pressure report is confirmed in the data (TPT). Subjects that are aware only of the final report have a higher probability of revising their initially truthful time pressure report (TPT).

leaves us with 76 subjects in CT and 75 subjects in TPT. Figure 5 displays the share of conscious dishonest reports for CT and TPT, respectively. For the contemplation report, 47 percent of the aware subjects decide to report dishonestly, while 49 percent do so for the time pressure report. Clearly, the difference between both treatments is not significant (χ^2 -Test: $p = 0.81$). The nearly perfect match of misreporting in both treatments indicates that time pressure has no effect on the conscious decision to misreport. Contrary to our hypothesis, this result shows that the conscious trade-off works at an intuitive level and thus requires almost no reflection time.



Note: Fraction of conscious deivers to conscious potential deivers.
Error bars indicate mean \pm SEM.

Figure 5: Conscious misreporting by treatment

Table 4: Multivariate analysis of conscious misreporting

VARIABLES	(1)	(2)	(3)	(4)
Time Pressure	-0.0196 (0.0518)	-0.0326 (0.0521)	-0.0311 (0.0523)	-0.0365 (0.0517)
Cognitive Reflection Test			-0.00527 (0.0218)	
Machiavellianism				0.0106** (0.00473)
Awareness	0.407*** (0.0483)	0.407*** (0.0480)	0.409*** (0.0481)	0.406*** (0.0477)
Constant	0.0858* (0.0461)	-0.0852 (0.210)	-0.0739 (0.217)	-0.417* (0.252)
Socio-Economic Controls	NO	YES	YES	YES
Observations	305	305	305	305
R ²	0.213	0.231	0.231	0.243

Notes: The dependent variable is the fraction of deceivers to potential deceivers. Time Pressure is a binary variable that is 1 for TPT and 0 for CT. Cognitive Reflection Test is the number of questions solved (0 to 3) and Machiavellianism is the score in the respective section of the Dark Triad (9 to 45). Awareness is a binary variable that is 1 if the subject reports being aware of the misreporting opportunity. Ordinary least squares (OLS); robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

This finding is confirmed by a regression analysis of the complete sample with all 305 observations that controls for the effect of awareness. The dependent variable in Table 4 is the share of dishonest reports and the reference group is the CT. Both base specifications (columns (1) and (2)) clearly show that awareness of the misreporting opportunity is the main determinant of misreporting. In contrast, the time pressure dummy is insignificant and hence indicates that time pressure has no effect on misreporting beyond its effect on awareness. While reflective thinking has no effect on conscious misreporting (column (3)), Machiavellianists have a significantly higher probability of giving a dishonest report (column (4)). This depicts the other side of the coin compared to the finding for awareness: deceptive traits predict conscious misreporting, but this is independent of a subject's reflectiveness.

Result 4 *Controlling for awareness of the misreporting opportunity, there is no evidence that time pressure has an effect on the conscious trade-off between costs and benefits of misreporting.*

In sum, the intuitive response is an honest report since the concept of misreporting is not present in the mind of most subjects. Hence, the majority

of subjects are not able to recognize the misreporting opportunity under time pressure, which in turn implies a low share of dishonest reports. However, time pressure has no effect on balancing the costs and benefits of misreporting and on the final conscious decision to misreport.

5 Discussion

In contrast to other settings, the subtlety and unpredictability of the misreporting opportunity in our framework allows for a more complete coverage of the misreporting process. It consists both of the cognition process of the misreporting opportunity, on the one hand, and the conscious decision on the actual report, on the other hand. We are able to separate both effects through the post-experimental questions on awareness in the respective stages. Since the cognition process requires the mental availability of the concept of deception and its ignorance automatically implies an honest report, it is an essential part of misreporting. Nevertheless, the cognition process has not been the focus of the literature so far. However, a decomposition of both steps is instructive for at least two reasons. First, misreporting opportunities differ considerably both with respect to their costs and benefits and also with respect to their unexpectedness and apparentness. Hence, a decomposition leads to a better understanding of the dynamics of misreporting under different circumstances, such as time pressure. Second, the decomposition gives valuable insights for the prevention of deception. For example, in case of intuitive choices, is it more effective to highlight the immorality of deceptive actions or to make the deception opportunity as non-transparent as possible?

Contrary to the previous literature (Shalvi et al. 2012 and Gunia et al. 2012), we find that time pressure leads to significantly less dishonest reports. This is in line with our hypothesis that misreporting is not the intuitive response. For dishonest reports, subjects need to have in mind the concept of deception to recognize the misreporting opportunity. Then, they have to make a conscious decision of whether to misreport or not. Both steps potentially require cognitive effort and hence may be time-consuming. However, our results show that it is not the trade-off between costs and benefits that is cognitively demanding and requires reflection time, but instead the cognition process of the misreporting opportunity. This finding is astonishing, since subjects only have to overcome their initial surprise to gain awareness of the misreporting opportunity. In many real-world occasions, deception opportunities are much more concealed compared to our setting. Once we control for awareness, the share of dishonest reports is identical across treatments, which suggests that the conscious decision to misreport is intuitive and does not require ample cognitive resources. Although the moral dilemma might be more pronounced in other settings, our results indicate that the misreporting decision is determined by an inherent preference for honesty rather than a reflective process. Hence, decreasing the transparency of the misreporting opportunity might be the most effective prevention of dishonesty. In contrast, actions that highlight the poten-

tial costs of misreporting might have countervailing effects if they increase the awareness of the deception possibility at the same time.

6 Conclusion

In this paper, we study the role of the time dimension for dishonest decision-making in a one-shot experiment. The time dimension is a crucial determinant of deception. Some misreporting opportunities are unforeseeable and require an intuitive decision, while others allow for extensive reflection time. Our treatments exogenously vary the level of reflection time available to participants, inducing an intuitive versus a reflective decision. We address the question of what impact time pressure has on dishonest reporting compared to sufficient reflection time. Moreover, we isolate the effect of time pressure on the cognition process that leads to awareness of the misreporting opportunity from its effect on the conscious decision to misreport.

In contrast to the previous literature, we find that misreporting is not the intuitive choice when subjects have the option to deceive for personal gain. This finding manifests in a lower share of dishonest reports as well as in an increased response time for dishonest subjects under time pressure. The decomposition into the cognition process of the misreporting opportunity and the conscious decision to misreport reveals that more reflection time increases the awareness of the misreporting opportunity, but has no effect on the conscious decision of whether to misreport or not. Hence, we find no evidence for our hypothesis that honesty is the automatic response due to the time-consuming nature of the conscious trade-off between costs and benefits. Instead, our results suggest that honesty is the automatic response since subjects need a considerable amount of reflection time to gain awareness of the misreporting opportunity. This is an important insight, since deception opportunities often come as a surprise and are not immediately obvious.

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