

Lying about Luck versus Lying about Performance

Agne Kajackaite

WZB Berlin Social Science Center*

July 10, 2018

Abstract

I compare lying behavior in a real-effort task in which participants have control over outcomes and a task in which outcomes are determined by pure luck. Participants lie significantly more in the random-draw task than in the real-effort task, leading to the conclusion lying about luck is intrinsically less costly than lying about performance.

Key Words: Cheating, Lying Costs, Luck versus Merit

JEL Classification: C91, D03, D63, D82

* Kajackaite: Berlin Social Science Center, Reichpietschufer 50, 10785 Berlin, Germany (e-mail: agne.kajackaite@wzb.edu). Financial support from the German Science Foundation (DFG) through the research unit "Design & Behavior" (FOR 1371) is gratefully acknowledged. I thank Dan Ariely, Uri Gneezy, Shaul Shalvi, Dirk Sliwka, Joel Sobel, and Marcin Waligora for valuable comments and suggestions. I also thank Dan Ariely for providing me with the original real-effort task instructions. I thank student research assistants at the University of Cologne for their help while conducting the experiment.

1 Introduction

People react differently to outcomes that are gained by luck than to those over which they have control, such as choices or performance. Evidence from fairness research shows that experimental participants are often willing to accept inequalities that result from effort, but they tend to redistribute when inequalities are due to luck (e.g., Konow, 2000; Cappelen et al., 2007; Almås et al., 2016). Cappelen et al. (2013) show people redistribute between lucky and unlucky risk-takers (differences in luck), but not between risk-takers and participants who choose the safe alternative (differences in choices). Experimental participants are also more generous when their endowment is randomly assigned than when it is earned with effort. Cherry et al. (2002) find that in a dictator game, dictators who bargain over earned wealth rather than unearned wealth are more selfish. Gravert (2013) shows participants who gained their payoff by merit are more likely to steal at the end of the experiment than participants with a randomly assigned payoff. Finally, low offers generated by bad luck are less likely than intentionally chosen low offers to be punished in an ultimatum game and other games involving reciprocity (see Blount, 1995; Charness, 2004). This literature demonstrates that participants in experiments are not consequentialists concerning fairness, risk outcomes, altruism, and reciprocity, but they do care about the way the outcomes come about.

In this paper, I study a related question regarding luck versus performance in the domain of lies. In particular, I compare lying about private outcomes in two different environments—a real-effort task (performance) and a random-draw task (luck). In both cases, lying regarding the private outcome increases the decision maker's payoffs. A large literature discussed below shows people have an intrinsic cost of lying, and in many cases, prefer to tell the truth even when lying would earn them more money. Would this cost of lying depend on how the private outcome was determined? By comparing lying behavior in a real-effort and a random-draw task, I measure how the way an outcome comes about affects lying.

In the real-effort task, based on Mazar et al. (2008), participants are asked to solve a set of 20 matrices in private and later report the number solved to the experimenter. The participants receive payment based on a piece rate per solved matrix. I infer lying by comparing the reported success in a private task treatment in which the experimenter does not observe the actual outcome with a baseline treatment in which performance is observed under the same incentives.

By contrast, in the random-draw task, based on Fischbacher and Föllmi-Heusi (2013), the outcome is determined by luck. Participants receive an envelope with 100 folded pieces of paper that have numbers from 1 and 20 on them, and are asked to take out one piece of paper in private and report the number to the experimenter. The participants receive a payment based on the number reported, where higher numbers result in higher payoffs. In this task, lying is inferred by comparing the expected distribution of reports with the actual distribution of reported numbers.

Economics research over the last several years has extensively studied lying. The literature shows that the propensity to lie depends on the elements of the decision task (e.g., Gneezy, 2005; Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013; Abeler et al., 2014; Cohn et al., 2014; Kajackaite and Gneezy, 2017, Abeler et al., 2016, Gneezy et al., 2017). Additionally, in some of these experiments, participants have the opportunity to lie partially by reporting a higher but not the maximal outcome or lie to the full extent. In some tasks, such as the real-effort task by Mazar et al. (2008), participants mostly lie only partially. In other tasks, such as the random-draw task by Fischbacher and Föllmi-Heusi (2013) (see Abeler et al., 2016, for a review), people lie both partially and to the full extent.

In this paper, I hypothesize that the way outcomes are determined causes different lying behaviors in the random-draw and real-effort tasks. Research in psychology shows that people are reluctant to attribute a negative outcome to bad luck when they can blame a more

tangible aspect of the event (see Creyer and Gürhan, 1997). In line with this finding, lying about a low outcome in the random-draw task can be attributed to bad luck, but blaming luck when working on a task and delivering a low output in the real-effort environment is harder.

Furthermore, in the spirit of the Norm Theory by Kahneman and Miller (1986), random draws contain a high level of mutability—imagining an outcome being different is easy; for example, one could have taken out several numbers from the envelope. The real-effort task, by contrast, has a low level of mutability—imagining a different outcome is hard after actually working on the task for a period of time. Evidence from experiments involving lying show that higher mutability of the outcome is associated with reporting of better outcomes (Batson et al., 1997; Shalvi et al., 2011; Shalvi et al., 2012; Shalvi et al., 2015).

Based on differences in attribution of bad luck and mutability in real-effort and random-draw tasks, lying about a random outcome might have a lower intrinsic lying cost than lying about performance. As a consequence, the hypothesis of this paper is that some participants will choose not to lie or to lie only partially in a real-effort task, whereas they might decide to lie and lie to the full extent in the random-draw game. In line with this hypothesis, I find participants lie significantly more in a random-draw task than they do in real-effort task. I conclude that lying about luck is less intrinsically costly than lying about performance. More generally, I show that the way outcomes are determined affects the decision to lie and the magnitude of that lie.

2 Experimental Design and Procedure

In the experiment, I use a between-subjects design with four treatments, varying the nature of the task (real-effort vs. random-draw), the possibility to cheat, and the information provided.

Whereas the first two treatments serve as controls, the last two show how lying differs depending on whether the outcome results from luck or performance.

In the first treatment, “Real-Effort Control I,” based on Mazar et al. (2008), participants receive an envelope containing a sheet with 20 matrices, each consisting of 12 three-digit numbers, and are asked to find two numbers adding up to 10 in each of the matrices. The full set of instructions can be found in the Appendix. After finishing the task, participants are asked to report the number of solved matrices on a sheet of paper, and the experimenter checks how many are solved correctly. Participants receive 50 cents per correctly solved matrix. Note that if the participant makes mistakes when solving matrices, the number of correctly solved matrices, rather than the reported number, determines the payoff.

In the second treatment, “Real-Effort Control II,” the instructions are the same as in the Real-Effort Control I, but in this case, participants have the possibility to cheat. Instead of letting the experimenter check the matrix sheet, participants are told to put the sheet back in the envelope and go to the other side of the room and shred the envelope in private. They then receive 50 cents per correctly solved matrix, according to the report they give the experimenter. By comparing the distribution of reported outcomes in this treatment to that in the Real-Effort Control I treatment, one can infer whether the reports are, in expectation, true.

The third treatment, “Real-Effort,” is the same as the Real Effort Control II treatment but contains additional information to make the treatment comparable to the random-draw treatment described below. Participants are informed that of 100 participants in a previous similar experiment (Real-Effort Control I) X solved Y matrices, Z solved W, and so on. Thus, in this treatment, participants know the expected outcome in the real-effort task.

In the final treatment, “Random-Draw,” participants receive an envelope with 100 folded pieces of paper with numbers from 1 and 20 on them. The distribution of the numbers

is the same as the distribution of matrices solved in the Real-Effort Control I treatment. The information these participants receive about the distribution is the same as in the Real-Effort treatment (i.e., X pieces of paper have the number “Y” on them, Z pieces of paper have the number “W,” and so on.). Participants are asked to take out one piece of paper, look at the number, put it back in the envelope, report the number on a sheet of paper, and shred the envelope before coming to the experimenter to collect the payoff. The payoff is equivalent to the real-effort task treatments—the number reported times 50 cents.

Table 1 presents the treatments and the number of participants in each.

Table 1: Summary of treatments and number of participants

Treatment	N
Real-Effort Control I	100 (60.00% female)
Real-Effort Control II	95 (64.21% female)
Real-Effort	95 (58.95% female)
Random-Draw	91 (61.54% female)

The experiment was conducted in June 2016 at the Cologne Laboratory for Economic Research, University of Cologne. Overall, 381 students (61.2% female) were recruited via ORSEE (Greiner, 2015); none of them participated in more than one session. Subjects participated only in this experiment in the experimental session, with a session lasting approximately 30 minutes.

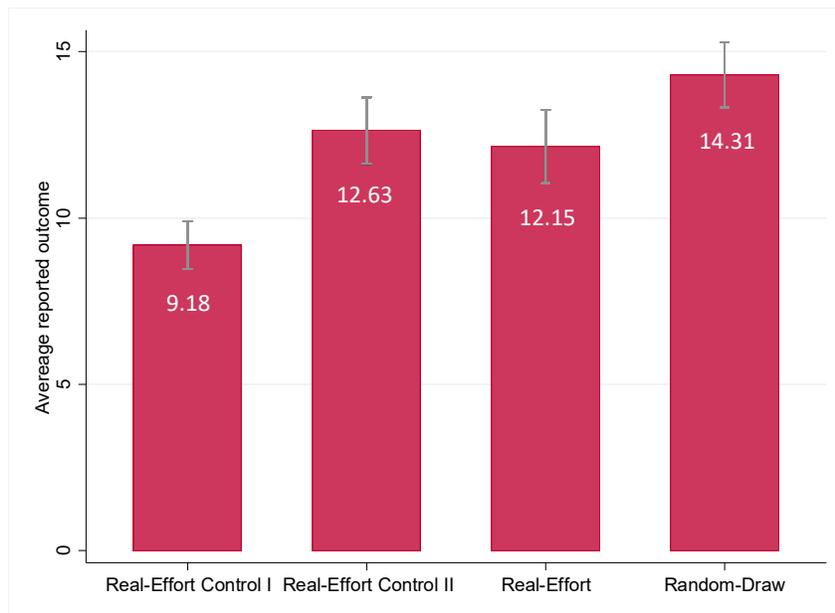
After arriving in the lab, participants read the instructions and were allowed to ask questions privately. Then, depending on the treatment, participants either received an envelope with a matrix sheet and were asked to work on it for 5 minutes, or received an envelope with numbers and were asked to take out one number from the envelope.

After solving the matrices/looking at the number, participants reported the outcomes on a sheet of paper and filled out a post-experiment questionnaire that included questions on gender, age, field of study, and motives behind their decisions. At the end, participants privately received their payoffs in cash and left the laboratory.

3 Results

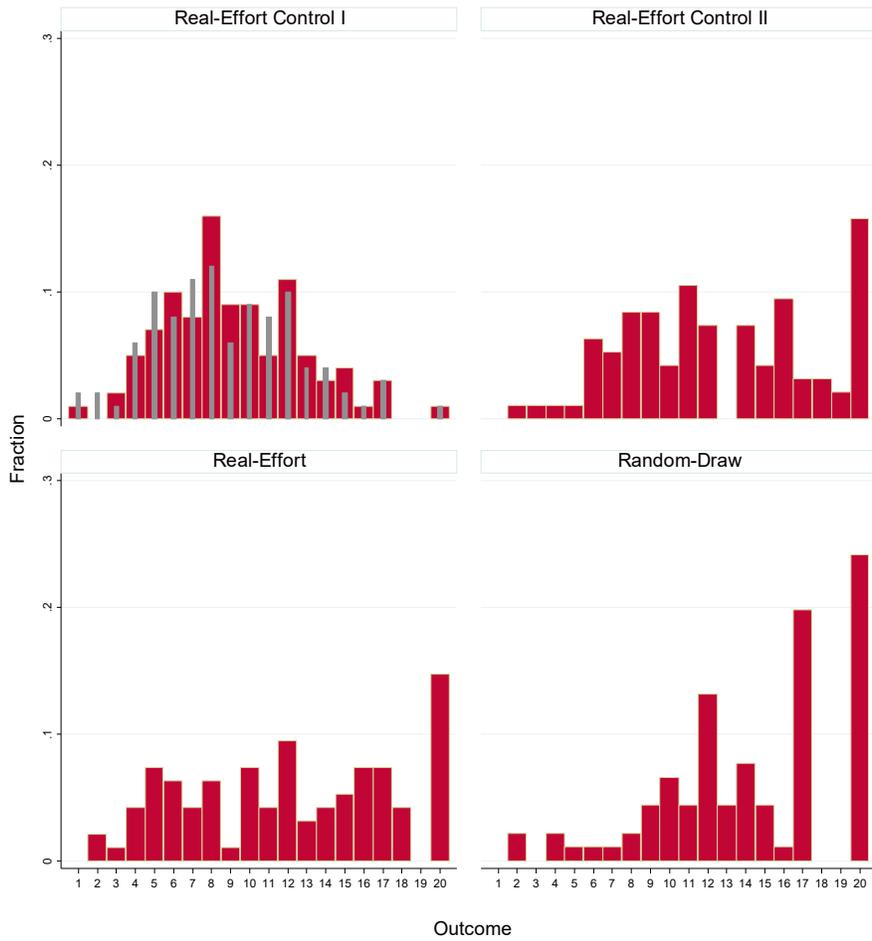
Figure 1 below reports aggregate results in the control and main treatments, and Figure 2 displays the distribution of actual and reported outcomes.

Figure 1: Average reported outcome over the treatments



Note: Error bars are standard errors of the mean.

Figure 2: Distribution of actual and reported outcomes over the treatments



Note: Grey bars denote the actual outcomes; red bars denote the reported outcomes.

As Figures 1 and 2 show, in the Real-Effort Control I treatment, participants claimed to have solved, on average, 9.18 (SD=3.62) out of 20 matrices. After the experimenter checked the matrices sheets, the actual average number of correctly solved matrices decreases to 8.81 (SD=3.79), which is significantly less than the outcome claimed on the reporting sheets ($p < 0.001$, Wilcoxon matched-pairs signed-rank test; all tests in this paper are two-sided). Grey bars in Figure 2 correspond to the actually solved matrices.

35 out of 100 participants made mistakes when solving matrices, with 6 of them reporting they solved fewer than they actually did, and 29 reporting they correctly solved

more than they actually did. Participants deviate by up to three matrices, and the wrong reporting seems to be caused by honest mistakes (e.g., the most common mistake was $9.41+0.49=10$). Note that in the Real-Effort and Random-Draw treatments, participants are provided with the distribution of actually correctly solved matrices in the Real-Effort Control I treatment and not the reported one.

In the Real-Effort Control II treatment, participants report having solved an average of 12.63 (SD=4.92) matrices—significantly more than the 9.18 reported (and 8.81 actually solved) matrices in the Real-Effort Control I treatment ($p<0.001$, MWU). It therefore follows that when participants have a possibility to cheat, they over-report the number of solved matrices.

Next, I compare outcomes reported in Real-Effort Control I and Real-Effort Control II treatments. Only the reporting of 16 and 20 differs between the treatments. First, there is a significant lying to the full extent – whereas in the Real-Effort Control I treatment, only 1 (1%) participant reports having solved the maximal amount of matrices, in the Real-Effort Control II treatment, 15 (15.79%) claim to have solved 20 matrices (Fisher exact test, $p<0.001$). Second, the data suggest that some participant lie partially – in the Real-Effort Control I treatment, 1 (1%) reports having solved 16, whereas in the Real-Effort Control II treatment, 9 (9.47%) report 16 ($p=0.008$, Fisher exact test).¹ Other pairwise comparisons are not significant.

In the Real-Effort treatment, lying behavior is similar to the one in the Real-Effort Control II treatment. Knowing the distribution of solved matrices in a previous experiment does not change participants' behavior, and they report having solved 12.15 (SD=5.38) matrices on average, compared to 12.63 (SD=4.92) in Real-Effort Control II (MWU, $p=0.571$). Similarly to the Real-Effort Control II treatment, some participants choose to lie

¹ Note that lying behavior observed in the Real-Effort Control II treatment is different from the behavior found in the experiment by Mazar et al. (2008), in which only 0.6% report having solved 20 matrices.

partially and some to the full extent. Reporting the maximal amount of matrices is more common than in Real-Effort Control I (14 (14.74%) and 1 (1%), respectively; $p < 0.001$, Fisher exact). Also, reporting 16 is significantly higher than in the control – reporting of 16 amounts to 1 (1%) in Real Effort Control I and 7 (7.37%) in Real-Effort (Fisher exact test, $p = 0.032$) with other pairwise comparisons being not significant.

Overall, comparing the distribution of reports in the treatments using the real-effort task, I conclude participants lie, with some lying partially and a high fraction lying to the full extent.

As hypothesized, the highest level of lying over all treatments is in the Random-Draw treatment. Participants report on average 14.31 (SD=4.70), which is significantly higher than the average outcome of 12.15 (SD=5.38) reported in the comparable Real-Effort treatment ($p = 0.006$, MWU). Note that although some of the over-reporting in the Real-Effort treatment might be due to honest mistakes when solving matrices, such over-reporting in the Random-Draw treatment is not due to honest mistakes. However, this feature makes the between-treatment difference only weaker than in the case when honest mistakes are not possible.

The highest level of lying in the Random-Draw treatment implies lying about luck is less costly for participants than lying about performance. As discussed in the introduction, a random-draw outcome can be attributed to bad luck, whereas a real-effort outcome is more likely to be attributed to own (mis)achievement. Furthermore, a random-draw outcome has a higher level of mutability than a real-effort outcome. This leads to a higher overall level of lying in the Random-Draw than in the Real-Effort treatment.²

² Note that the experimental design does not exclude all alternative explanations for lying being higher in the Random-Draw than in the Real-Effort treatment. One possible explanation is that participants are afraid they will have to demonstrate to the experimenter how they can solve matrices ex-post. However, doing so would require that the participants do not believe the instructions and also that the experimenter is using deception in the lab. Note believing the experimenter is a general problem in many experiments and is not a special feature of this experiment. Importantly, possible mechanisms are working in the opposite direction than the hypothesis (and the result): One could argue willpower to resist lying is lower after working on a task (possible ego-depletion) or

With respect to the size of the lie, a high fraction of participants, 24.18%, in the Random-Draw treatment report the maximal outcome of 20, which is significantly higher than 1% in the actual distribution of the numbers ($p < 0.001$, binomial test). Lying partially is also significant, with 19.78% reporting a 17, whereas in expectation, 3% should observe that number ($p < 0.001$, binomial test). Other partial lies are not significant.

Comparing full-extent and partial lying between Real-Effort and Random-Draw treatments, 14.74% report the maximal outcome of 20 in the Real-Effort treatment, and 24.18% do so in the Random-Draw treatment. Thus, a higher fraction of participants lie fully in the Random-Draw than in Real-Effort treatment. However, the difference is not statistically significant (Fisher exact test, $p = 0.137$). Furthermore, partial lying differs between treatments. Whereas in the Real-Effort treatment, a significant fraction of participants lie by reporting 16, in the Random-Draw treatment, the number reported when lying partially is 17. To be able to compare the partial lying in the two treatments, I pool the reports of 16 and 17 in each of the treatments and use it as a partial lying proxy. In the Real-Effort treatment, 14.74% report 16 or 17, whereas in the Random-Draw treatment, 20.88% do so. Thus, the fraction of lying is higher in the Random-Draw treatment, but not significantly so ($p = 0.338$, Fisher exact test). That is, both partial and full-extent lying are slightly higher in the Random-Draw treatment than in the Real-Effort treatment, which results in a significantly higher overall level of lying in the Random-Draw treatment.

that participants feel entitled to get a reward after exerting effort, which would result in more lying about performance than about luck. Furthermore, participants might report a higher outcome in the real-effort task to appear smarter, whereas this motive cannot be driving lying in the random-draw task. If those mechanisms are in place, they make the highly significant results of this paper weaker and show therefore the results are even more reliable.

4 Conclusion

Because lying can have detrimental consequences on private individuals, firms and government, the economics literature has extensively researched it over the last several years. Studies in behavioral economics suggest that in addition to the standard cost of lying (determined by the probability of being caught and the penalty associated with the lie; see Becker, 1968), an intrinsic cost of lying also exists: some people experience a psychological disutility when telling a lie. This paper provides experimental evidence on how the intrinsic lying cost depends on the way the outcome comes about. I show participants lie less when the outcome they report is determined by performance rather than by luck. From this finding, I conclude that lying about performance entails a higher intrinsic cost than lying about luck.

Abeler et al. (2016) report lying to be low in random-draw experiments; specifically, from the data of 72 experimental studies, they conclude, “Subjects obtain only about a quarter of the payoff they could obtain by reporting the payoff-maximizing state.” In the current experiment, I directly compare a random-draw task with a real-effort task and find that in the real-effort task, lying is lower than in the random-draw task. Because most of the outcomes in our everyday lives are based not only on luck but also on other variables over which we have control, the result of this study suggests the random-draw paradigm—one of the most often used methods for measuring lying in economics—is a “pessimistic” estimate of the actual propensity to lie.

References

- Abeler, J., Becker, A., Falk, A. (2014). Representative evidence on lying costs. *Journal of Public Economics*, 113, 96-104.
- Abeler, J., Nosenzo, D., Raymond, C. (2016). Preferences for truth-telling. Mimeo.

- Almås, I., Cappelen, A.W., Sørensen, E.Ø., Tungodden, B. (2016) Americans are not more meritocratic or efficiency-seeking than Scandinavians. Mimeo.
- Batson, C. D., Kobrynowicz, D., Dinnerstein, J. L., Kampf, H. C., Wilson, A. D. (1997). In a very different voice: Unmasking moral hypocrisy. *Journal of Personality and Social Psychology*, 72, 1335–1348.
- Becker, G.S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76(2), 169-217.
- Blount, S. (1995). When Social Outcomes Aren't Fair: The Effect of Causal Attributions on Preferences. *Organizational Behavior and Human Decision Processes*, 63(2), 131-144.
- Cappelen, A.W., Hole, A.D., Sørensen, E.Ø., Tungodden, B. (2007). The pluralism of fairness ideals: An experimental approach. *American Economic Review*, 97(3), 818–827.
- Cappelen, A.W., Konow, J. Erik Ø., Sørensen, E.Ø., Tungodden, B. (2013). Just Luck: An Experimental Study of Risk-Taking and Fairness. *American Economic Review*, 103(4), 1398-1413.
- Charness, G. (2004). Attribution and Reciprocity in an Experimental Labor Market. *Journal of Labor Economics*, 22(3), 665-688.
- Cherry, T.L., Frykblom, P., Shogren, J.F. (2002). Hardnose the Dictator. *American Economic Review*, 92(4), 1218-1221.
- Cohn, A., Fehr, E., Maréchal, M. (2014). Business culture and dishonesty in the banking industry. *Nature*, 516, 86-89.

- Creyer, E. H., Gürhan, Z. (1997). Who's to blame? Counterfactual reasoning and the assignment of blame. *Psychology & Marketing*, 14(3), 209-222.
- Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics*, 10(2), 171-178.
- Fischbacher, U., Föllmi-Heusi, F. (2013). Lies in Disguise – An Experimental Study on Cheating. *Journal of the European Economic Association*, 11(3), 525-547.
- Gneezy, U. (2005). Deception: The Role of Consequences. *American Economic Review*, 95(1), 384-394.
- Gneezy, U., Kajackaite, A., Sobel, J. (2018). Lying Aversion and the Size of the Lie. *American Economic Review*, 108(2), 419-453.
- Gravert, C. (2013). How luck and performance affect stealing. *Journal of Economic Behavior & Organization*, 93, 301–304.
- Greiner, B. (2015). Subject Pool Recruitment Procedures: Organizing Experiments with ORSEE. *Journal of the Economic Science Association*, 1(1), 114-125.
- Kahneman, D., Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review*, 93, 136–153.
- Kajackaite, A., Gneezy, U. (2017). Incentives and cheating. *Games and Economic Behavior*, 102, 433-444
- Konow, J. (2000). Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions. *American Economic Review*, 90(4), 1072-1091.
- Mazar, N., Amir, O., Ariely, D. (2008). The Dishonesty of Honest People: A Theory of Self-Concept Maintenance. *Journal of Marketing Research*, 45(6), 633-644.

Shalvi, S., Dana, J., Handgraaf, M., De Dreu, C.K.W. (2011). Justified ethicality: Observing desired counterfactuals modifies ethical perceptions and behavior. *Organizational Behavior and Human Decision Processes*, 115, 181-190.

Shalvi, S., Eldar, O., Bereby-Meyer, Y. (2012) Honesty Requires Time (and Lack of Justifications). *Psychological Science*, 23(10), 1264 –1270.

Shalvi, S., Gino, F., Barkan, R., Ayal, S. (2015). Self-Serving Justifications: Doing Wrong and Feeling Moral. *Current Directions in Psychological Science*, 24(2), 125 –130.

/For online publication only/

Appendix: Instructions

Real-Effort Task

Matrix task

5.64	2.85	9.48
1.68	9.52	2.15
6.71	4.36	1.67
8.1	5.48	8.91

1.63	2.32	7.93
4.92	6.1	5.83
2.81	6.78	7.19
8.46	5.67	7.57

7.87	3.62	9.41
5.72	7.4	5.84
2.49	9.59	6.62
4.16	5.61	0.49

8.18	9.01	3.97
5.2	4.56	9.12
0.28	2.92	6.59
1.12	6.93	9.72

1.43	2.11	5.36
7.45	8.57	9.3
5.39	2.29	0.42
3.28	4.43	2.6

3.99	3.91	4.34
8.39	2.72	0.51
9.61	3.57	2.36
6.09	4.56	1.58

4.74	4.23	1.34
2.1	5.49	4.21
6.26	7.86	9.78
0.89	2.14	6.71

6.58	8.97	3.21
3.85	3.87	5.82
4.14	9.46	6.15
9.12	4.2	6.83

4.91	6.86	7.76
8.96	2.29	5.99
7.71	2.94	4.25
2.01	1.28	5.12

5.47	2.49	6.28
3.82	4.21	7.91
2.65	4.17	4.53
7.49	0.55	6.39

9.83	0.65	2.23
6.52	5.1	9.28
3.91	1.42	4.42
3.48	6.95	4.87

6.09	8.66	7.37
3.51	2.9	1.34
2.02	5.06	2.89
8.1	7.61	8.84

3.53	5.94	4.16
6.15	2.97	2.32
1.9	9.3	7.68
3.55	4.72	2.32

0.74	4.55	3.19
8.17	7.91	1.83
5.62	0.81	2.15
3.75	3.72	2.09

1.08	5.19	6.6
6.56	3.06	2.72
8.98	9.22	3.39
0.71	3.44	4.48

0.17	7.13	7.2
2.54	5.16	5.49
9.48	8.5	9.71
2.87	6.86	1.23

2.32	4.51	6.13
9.35	8.05	4.96
1.02	6.34	1.95
8.82	7.2	2.14

8.19	6.46	1.62
8.29	2.91	2.03
2.73	7.89	9.86
6.21	3.54	3.18

9.43	6.57	8.33
1.58	8.55	0.67
9.33	3.5	3.72
3.46	2.36	2.66

3.47	2.6	4.11
6.63	8.89	2.36
1.32	9.84	4.9
7.4	1.65	2.09

Instructions: Real-Effort Control I

Welcome to our experiment. Please read the instructions carefully. If you have a question, please raise your hand and we will come over to you. Please do not communicate with other participants during the experiment.

Every participant will receive 4 Euros for attending, which will be paid out independently of the decisions made in the experiment.

Furthermore, you will be able to earn additional money. At the end of the experiment, you will receive the income which you earned over the course of the experiment plus the 4 Euros for attending in cash.

Your decisions are private and no other participant will know about them.

We will give you an envelope with a sheet with 20 matrices as the one below in it:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

In each matrix you should look for a set of numbers that **sum up exactly to 10**.

When you find a set, circle the numbers, as in the example below:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

You will have **5 minutes** for this task.

Once the time is up, we ask you to count the amount of matrices solved and put it back in the envelope.

After that please report the number of the matrices you solved on a separate reporting sheet we put on your desk.

You will be paid **0.50 Euros** for each matrix solved.

After everybody is done, we will ask you to come to the front to pick up your payoff. Please bring the reporting sheet and the envelope with the matrices sheet to the front with you. We will check how many matrices are solved correctly and pay you accordingly.

If you have any questions please raise your hand and we will come to you!

Instructions: Real-Effort Control II

Welcome to our experiment. Please read the instructions carefully. If you have a question, please raise your hand and we will come over to you. Please do not communicate with other participants during the experiment.

Every participant will receive 4 Euros for attending, which will be paid out independently of the decisions made in the experiment.

Furthermore, you will be able to earn additional money. At the end of the experiment, you will receive the income which you earned over the course of the experiment plus the 4 Euros for attending in cash.

Your decisions are private and no other participant will know about them.

We will give you an envelope with a sheet with 20 matrices as the one below in it:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

17

In each matrix you should look for a set of numbers that **sum up exactly to 10**.

When you find a set, circle the numbers, as in the example below:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.80	6.09	2.46

You will have **5 minutes** for this task. Once the time is up, we ask you to count the amount of matrices solved and put it back in the envelope.

After that please report the number of the matrices you solved on a separate reporting sheet we put on your desk.

The number you report determines how much money you will be paid. You will be paid **0.50 Euros** times the number you report. In other words, if you write “1”, you receive 0.50€. If you write “2”, you receive 1€, if you write “3”, you receive 1.5€ and so on.

After you filled in the reporting sheet, we ask to go to the shredder at the end of the room and shred the envelope with the matrices.

After everybody is done with the experiment, we will ask you to come to the front to pick up your payoff. Please bring only the reporting sheet to the front with you.

If you have any questions please raise your hand and we will come to you!

Instructions: Real-Effort

Welcome to our experiment. Please read the instructions carefully. If you have a question, please raise your hand and we will come over to you. Please do not communicate with other participants during the experiment.

Every participant will receive 4 Euros for attending, which will be paid out independently of the decisions made in the experiment.

Furthermore, you will be able to earn additional money. At the end of the experiment, you will receive the income which you earned over the course of the experiment plus the 4 Euros for attending in cash.

Your decisions are private and no other participant will know about them.

We will give you an envelope with a sheet with 20 matrices as the one below in it:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

In each matrix you should look for a set of numbers that **sum up exactly to 10**.

When you find a set, circle the numbers, as in the example below:

Example		
3.91	0.82	3.75
1.11	1.69	7.94
3.28	2.52	6.25
9.81	6.09	2.46

In a similar experiment 100 people were asked to solve the matrices task and had 5 minutes time for it. 2 of them solved 1 matrix; 2 solved 2 matrices; 1 solved 3 matrices; 6 solved 4 matrices; 10 solved 5 matrices; 8 solved 6 matrices; 11 solved 7 matrices 12 solved 8 matrices; 6 solved 9 matrices; 9 solved 10 matrices; 8 solved 11 matrices; 10 solved 12 matrices, 4 solved 13 matrices, 4 solved 14 matrices; 2 solved 15 matrices; 1 solved 16 matrices; 3 solved 17 matrices und 1 solved 20 matrices.

You will have **5 minutes** for this task. Once the time is up, we ask you to count the amount of matrices solved and put it back in the envelope.

After that please report the number of the matrices you solved on a separate reporting sheet we put on your desk.

The number you report determines how much money you will be paid. You will be paid **0.50 Euros** times the number you report. In other words, if you write “1”, you receive 0.50€. If you write “2”, you receive 1€, if you write “3”, you receive 1.5€ and so on.

After you filled in the reporting sheet, we ask to go to the shredder at the end of the room and shred the envelope with the matrices.

After everybody is done with the experiment, we will ask you to come to the front to pick up your payoff. Please bring only the reporting sheet to the front with you.

If you have any questions please raise your hand and we will come to you!

Instructions: Random-Draw

Welcome to our experiment. Please read the instructions carefully. If you have a question, please raise your hand and we will come over to you. Please do not communicate with other participants during the experiment.

Every participant will receive 4 Euros for attending, which will be paid out independently of the decisions made in the experiment.

Furthermore, you will be able to earn additional money. At the end of the experiment, you will receive the income which you earned over the course of the experiment plus the 4 Euros for attending in cash.

Your decisions are private and no other participant will know about them.

We will give you an envelope with 100 pieces of paper in it. The numbers on the paper pieces are between 1 and 20 and they are placed in a random order.

There are 2 pieces of paper with the number “1” on it, 2 pieces with the number “2”, 1 piece with number “3”, 6 pieces with the number „4“, 10 pieces with the number „5“, 8 pieces with the number „6“, 11 pieces with the number „7“, 12 pieces with the number „8“, 6 pieces with the number „9“, 9 pieces with the number „10“, 8 pieces with the number „11“, 10 pieces

with the number „12“, 4 pieces with the number „13“, 4 pieces with the number „14“, 2 pieces with the number „15“, 1 piece with the number „16“, 3 pieces with the number „17“, and 1 piece with the number „20“. We will ask you to take out one piece of paper.

Once you take a piece of paper out of the envelope, you will see a number that we ask you to remember and then put it back in the envelope.

After that please report the number you saw on a separate reporting sheet we put on your desk.

The number you report determines how much money you will be paid. You will be paid **0.50 Euros** times the number you report. In other words, if you write “1”, you receive 0.50€. If you write “2”, you receive 1€, if you write “3”, you receive 1.5€ and so on.

After you filled in the reporting sheet, we ask you to go to the shredder at the end of the room and shred the envelope with the numbers.

After everybody is done, we will ask you to come to the front to pick up your payoff. Please bring only the reporting sheet to the front with you.

If you have any questions please raise your hand and we will come to you!

Reporting sheet

REPORTING SHEET

Your cubicle number: _____

Please report the number of matrices that you solved: _____

// Please report the number you saw: _____ //

Also please answer the following demographic questions:

Age: _____

Gender: _____

Major: _____

Semester: _____

Please describe briefly how you made your decisions in this experiment:
