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Size matters - when it comes to lies

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Size matters - when it comes to lies

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Abstract

A small lie appears trivial but it obviously violates moral commandments. We analyze whether the preference for others' truth telling is absolute or depends on the size of a lie. In a laboratory experiment we compare punishment for different sizes of lies controlling for the resulting economic harm. We find that people are sensitive to the size of a lie and that this behavioral pattern is driven by honest people. People who lie themselves punish softly in any context.

JEL Classification: C91, D03, D82

Keywords: Lying, norm violation, punishment, experiment

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1. Introduction

"You shall not bear false witness against your neighbor." (Exodus, 20: 16). A lie violates this commandment and similar social norms and might therefore offend others. Apart from being dishonest, lying can also be harmful if the liar exploits her private information at the expense of an uninformed person. Even if the actual economic damage is limited, a small deviation from the truth is already in breach of the commandment. In this paper we investigate if people take the size of the lie into account when they punish exploitive lies.

A large philosophical literature discusses the morality of lying. Immanuel Kant or Augustine for example objected strongly to lying irrespective of its social and economic consequences[4] while others (e.g. Schopenhauer, Aristotle, see detailed discussions in Flier, 2007 or Dietz, 2002) were more relaxed about lies, e.g. in the context of self-defense or compassion. Similarly, in law, punishment rules for deliberately false statements differ across policy fields and countries. Carbon emissions provide a policy example for punishment that does not reflect the size of a lie. In Australia, any deliberate misrepresentation of emissions is penalized irrespectively of its size.[5] One motive for implementing such a policy is that people "simply do not like being misled as such and that this triggers a taste for punishment" (Brandts and Charness, 2003). One obvious counter-example is the punishment for tax evasion, see for example Allingham (1972) or Yitzhaki (1974). In most countries, the intensity of punishment depends on the size of the tax fraud, not just on the tax fraud itself. "[T]he level of punishment should (…) 'fit' the crime" (Becker, 1968, as quoted in Slemrod, 2007, p.43). Becker's comment brings about the belief that people differentiate between a small lie and a big lie. A big lie in this context implies a stronger deviation from the truth and inflicts more harm than a small lie. In consequence, any empirical analysis of lies, their size and their punishment has to address the crucial confound that people increase their punishment in the size of the lie because of the simultaneous increase in the economic harm. In a laboratory experiment we compare punishment for different sizes of lies controlling for the fact that lies of a different size also have different economic consequences.

A great part of economic theory derives from the fact that people can use information asymmetry to maximize their gains. Misrepresentation of information (i.e., lying or deception) is

[4] "By a lie a man throws away and, as it were, annihilates his dignity as a man." Kant (1971, p. 93)

one way to do this. The issue of deception has attracted attention among economists in various circumstances, e.g. negotiations, consumer behavior, tax payments, accounting, politics, etc. (see e.g., Anton, 1993; Romer, 1996; Mazar et al., 2008; and Gino and Pierce, 2010).

In consequence, experimental studies shed light on lying from different viewpoints. We divide this literature into two categories: studies on lying aversion and studies on liar aversion. Articles in the first category study incentives to lie and the disutility lying causes to the potential liar (i.e. lying aversion). Several studies show that the occurrence of lying depends on the outcome and that many people are lying averse, e.g. Gneezy (2005), Cai and Wang (2006), Sutter (2009), Rode (2010), Charness and Dufwenberg (2006), Lundquist et al. (2009), Sánchez-Pagés and Vorsatz (2007), Sánchez-Pagés and Vorsatz (2009), Kartik (2009), or Hurkens and Kartik (2009). Fischbacher and Heusi (2008) show that a significant share of people is lying averse. In their experiment lying is not harmful for a second party, but still 39% will not lie to increase their profits. Lundquist et al. (2009) find that lying aversion increases in the "size of the lie and strength of the promise".

The second category focuses on liar aversion, i.e. a disutility caused by being told a lie. Several studies have shown that people are liar averse and that lying increases punishment (see e.g. Brandts and Charness, 2003; Sánchez-Pagés and Vorsatz, 2007; Sánchez-Pagés and Vorsatz, 2009, and Croson et al., 2003).

Our paper contributes to both categories because, first, we analyze liar aversion. Thereby we differentiate between a general liar aversion and a special aversion to big liars. Second, we also consider lying aversion in order to distinguish liar aversion of liars and honest people. The novelty of our design is that we separate lying from its economic impact by comparing two treatments. In one treatment, a sender can impose economic harm on a receiver by choosing an unequal allocation. In the other treatment the choice of an unequal allocation necessarily requires an untruthful statement. In both treatments the computer randomly ignores an unequal allocation choice of the sender, and implements the equal split. Only in this case the receiver can punish the sender. Hence, the experimental design makes sure that inequity aversion cannot explain any subsequent punishment. The article of Brandts and Charness (2003) also falls into both categories. They analyze whether people exhibit a "consistent attitude" with respect to lying and

[5] See the background information on Australia's National Greenhouse Emissions Reporting Act 2007 (NGER), http://www.climatecapital.com.au/NGER.html

punishing lies. They find that honest people punish liars stronger than dishonest people do. This is why in our study we also distinguish between honest people's and liar's liar aversion.

The first part of our results is in line with other studies. People are lying averse and liar averse. Additionally, we can show that the size of a lie matters. Liar aversion is increased by the degree of untruthfulness. In particular, it is the honest people who drive this behavioral pattern. Liars are not liar-averse and do also not react to the size of the lie. The following section presents the design of the experiment in detail. In Section 3 we describe predictions. Section 4 shows the results, and section 5 provides conclusions.

2. Experimental Design and Procedures

In our experiment a player A can inflict economic harm on another person (player B). Player A receives an endowment of 20, 60, or 100 points. Player B receives no endowment. She also has no information about the actual size of Player A's endowment but the distribution of endowments (see above) is common knowledge. Player A can divide her endowment into equal or unequal shares. If A receives 100 points she can transfer 10, 30, or 50 points to player B. If she receives 60 points, she can transfer 10 or 30 points to player B. If she receives 20 points, she has to transfer 10 points. In our analysis we are going to focus on subjects with an endowment of 100, since they can choose between two different unequal allocations: (70,30) and (90,10). From now on we will label the allocation (70,30) as *small inequality*. A *large inequality* will describe the allocation (90,10).

B learns A's decision. After A's decision a die determines whether B also learns about the size of A's endowment. B's chance to learn about the endowment is two out of three. If B does not learn about the actual size of the endowment, A's decision is implemented. If B learns the actual endowment, the computer cancels A's decision and automatically implements the equal split. After the computer implemented the equal distribution, and if A had transferred less than 50% of the actual endowment, B can punish A by eliminating points from A's account. One point of elimination costs B 0.2 points. B can eliminate all of A's points but a negative payoff is impossible.

In order to analyze responses to different size of lies, but also to control for the intended inequality, there are two different treatments. In *Standard,* participants play the game as described above. Depended on their endowment, player A can transfer 10, 30 or 50 points to player B. The second treatment (*Lie*) differs in only one respect: Player A has to lie to player B if she chooses an unequal split. More specifically, A has to report the size of her endowment, and here lying is possible. Player A can communicate a pie size of 100, 60 or 20. If the actual size of the endowment is not revealed, player B receives 50% of the *communicated* endowment. Player A in turn keeps the remainder of the *actual* endowment. In case of revelation, both A and B receive 50% of the actual endowment, and B can punish A. This means, in both treatments we use the same splits: (50,50), (70,30), and (90,10).

We conducted this experiment as a one-shot game with direct response method in which all subjects played both the roles of A and B. First, every player decided in the role of player A. In this role two subjects in each session received an endowment of 20 points. Two more received an endowment of 60 points and all other subjects an endowment of 100 points. Hence, player B could not immediately observe, if player A chose an unequal split or just received a smaller endowment. After their decision as player A, every player received the decision of another player A and decided as player B. A die decided ex-post if a subject received her payment for her decision in role A or in role B. By this means, the design allows us to distinguish liar's liar aversion from honest people`s liar aversion. To avoid any potential direct reciprocity effect, participants were never matched twice, and were not informed about the final outcome of their decision as player A when they made their decision as player B. The whole procedure was common knowledge. We conducted 19 sessions in the time from June 2010 to April 2011 (with 14-28 subjects each). All sessions were conducted at the LakeLab (TWI/University of Konstanz) with a total number of 854 participants. The experiment took about 35 minutes, one point translated into 0.20 Euro. Average income of participants was 8.76 Euro (11.52 US-$). The games were programmed with zTree by Fischbacher (2007). We recruited participants using the online recruiting system ORSEE by Greiner (2004). Each subject sat at a randomly assigned PC terminal and was given a copy of instructions.[6] A set of control questions was provided to ensure the understanding of the game. The experiment did not start until all subjects had answered all questions correctly. We ensured that no subject participated more than once in our experiment.

3. Behavioral Predictions

In this section we discuss several motivations why and how people might punish in the two different treatments. Obviously, a rational selfish person would never punish because punishment

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[6] A translation of the instructions can be found in the appendix.

is costly for her and she cannot recoup any money. Theories that model non-selfish motives based on outcome-oriented preferences, such as Bolton and Ockenfels (2000) or Fehr and Schmidt (1999), also do not predict any punishment as punishment is only possible after revelation of the true endowment. Since in this case the computer always implements the equal distribution anyway, models of inequity aversion cannot explain the occurrence of punishment.

Hypothesis 1 (Homo Economicus & Inequity Aversion): No punishment will occur.

Falk and Fischbacher (2006), Levine (1998) and Rabin (1993) argue that people take the intentions of others into account. In our experiment a person who chooses an unequal allocation has unfair intentions. The intention to implement a small inequality is less unfriendly than the intention to implement a large inequality. If we assume that people take the fairness of the intended action into account, Hypothesis 2 follows.

Hypothesis 2 (Intentions): Punishment for large inequalities will be higher than for small inequalities.

The two treatments differ in the communication procedure. In *Standard* player A communicates the amount of points she wants to transfer to player B. In *Lie* player A communicates her initial endowment. If she does not want to share equally, she has to lie and communicate a false initial endowment. Intention-based models include the proposed distribution but not the way the proposal has been communicated. Hence, Hypothesis 2 postulates no differences between the treatments. Considerations of kindness (as in Falk and Fischbacher, 2006) or altruism (as in Levine, 2003) focus on the interaction of deliberate decision making and economic outcomes. However, if people have a preference for truth telling punishment for lies should be higher than for communicated transfers.

Hypothesis 3 (Liar Aversion): For any given unequal distribution, punishment in *Lie* will be higher than in *Standard*.

Last but not least we look whether the size of a lie matters. Empirical support for hypothesis 3 already provides a departure from established theoretical models of reciprocal behavior. The punishment of unfair intentions and of lies both reflect a response to a violation of social and/or moral norms. If fairness and truthfulness reflect a more general norm, perhaps 'decency', we therefore expect an interaction between the punishment of unfair intentions and lying aversion. The use of a deliberately false statement amplifies the negative intentions behind the choice of an unfair allocation.

Hypothesis 4 (Size of the Lie): People will increase punishment with the size of the inequality. They will react stronger to that increase in *Lie* than in *Standard*.

In line with the results from Brandts and Charness (2003) we expect honest people and liars to show different behavioral patterns with respect to liar aversion and big-liar aversion. People who lie themselves are likely to attach less value to honesty as a social norm. This difference should have an impact on their punishment behavior.

Hypothesis 5 (Heterogeneity in liar aversion): Honest people punish lies more strongly than liars.

Our argument for hypothesis 4 rested on the assumption that fairness and honesty norms interact and coalesce into a more general social norm. If this positive interaction actually exists, dishonest people should worry less about unfair intentions than honest ones.

Hypothesis 6 (Heterogeneity in big-liar aversion): Honest people react stronger to the size of a lie than liars.

4. Experimental Results

In this section we are going to present the results of the experiment. First, we are going to evaluate player B's liar aversion. Our measure is the deducted punishment points, i.e. the loss of player A due to punishment. Second, we are going to discuss player A's transfer decision in order to classify people into liars and non-liars. Finally, we compare whether people's own lying behavior affects their reaction to the experienced size of a lie.

For the following analysis on liar aversion we focus on a subset of data. We measure lying aversion by punishment points assigned to player A by player B.[7] Punishment can only occur if –

[7] We could also use punishment probability as measure for liar aversion. However, since main results do not change and punishment points lead to more variance, we limit the analysis to punishment points.

after a choice of an unequal distribution – the random mechanism discloses the actual endowment and imposes the equal split. Thus, we focus on a subset of the available data. We analyze the situation in which player A received an endowment of 100 points, player A chose one of the two unequal splits, the actual endowment was revealed, and therefore both players received 50 points. For this case we can compare punishment for different size of lies. At the end of this section, for the analysis of heterogeneity of liar aversion, we will categorize people into liars and honest people. In order to do so, we can only include players who themselves were in a position to choose between a lie and being honest. For reasons of comparability we only use players with a pie size of 100. We use this subset of data for the whole data analysis.[8] Table 1 gives the number of observations.

		Standard	Lie
All observations		404	450
Subset1	Player A: Pie 100	340 (84%)	378 (84%)
Subset2	Player A: Pie 100, unequal split, disclosed	131 (32 %)	142 (32%)
Subset3	Player A: Pie 100, unequal split, disclosed Player B: Pie 100	111 (27 %)	129 (29%)

Table 1: Number of Observations (share of observations in treatment)

Liar aversion

How does punishment differ with respect to whether player A lied to achieve her goal? And does this punishment decision – reflecting liar aversion - differ with respect to the size of the lie? We will look at the punishment decision of player B who just learned that the original endowment is 100 and that player A did not intend to share the endowment equally. Since in this case the computer implemented the equal split, the outcome of player A and player B is the same (namely 50 each) and does not depend on the initial decision of player A. Figure 1 shows the

[8] Results are stable across subsets of data.

deducted punishment points from player A by player B. We consider 4 different cases: small and large inequality in *Lie* and small and large inequality in *Standard.* There is punishment in all 4 cases. Obviously these results reject the first hypothesis (homo economicus and inequity aversion) since punishment occurred although the equal split was implemented.

We can also reject Hypotheses 2 since, at least in *Standard*, punishment is not aligned with the intended unfriendliness. Punishment for trying to implement a large inequality is 5.03 (standard deviation 11.88), whereas punishment for an intended small inequality is 6.09 (11.25). This difference is not significant.

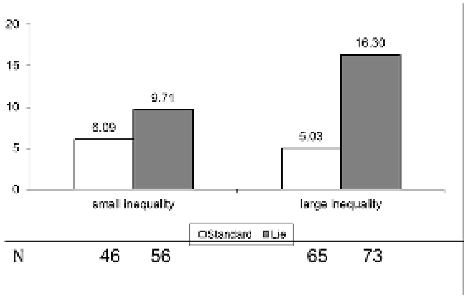

Figure 1: Deducted punishment points of player A by player B, Subset3

However, the data confirms Hypotheses 3. We find that punishment in *Lie* is significantly higher than in *Standard* in both situations. For a small inequality punishment is 6.09 in *Standard* compared to 9.71 in *Lie* (Wilcoxon ranksum test, $p<0.05$). Punishment for a large inequality is 5.03 in *Standard*. With 16.30 in L*ie* it is more than three times as high (Wilcoxon ranksum test, $p<0.01$). Hence, lies are punished significantly stronger than intended inequalities alone. People not only punish the actual unfair intention but also the lie. The first regression in Table 2 reinforces the result. The interaction term in the second regression of Table 2 validates that the size of a lie significantly affects people's punishment decision. People not only punish lies per se but are also sensitive to the size of the lie. This supports Hypothesis 4.

	(1)	(2)
Lie treatment	8.034***	3.627
	(1.779)	(2.347)
Large inequality	3.075*	-1.056
	(1.771)	(2.216)
Lie×Large		7.643**
		(3.451)
Constant	3.668**	6.087***
	(1.505)	(1.654)
Observations	240	240
R-squared	0.086	0.103

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Regression with Subset3, dependent variable deducted punishment points from player A, robust standard errors

Brandts and Charness (2003) show that honest people and liars differ in their response towards a lie. They find that honest people punish liars stronger than dishonest people do. We are interested in whether liars and honest people also differ in their response to big lies vs. small lies. The feature of our design is that we can easily analyze individual relations between lying – and liar aversion. Hence, we turn to people's lying behavior.

Lying aversion and liar aversion

In *Standard* 37% of players A with an endowment of 100 choose to share the pie equally. In *Lie*, where not choosing the equal share implies telling a lie, people are slightly friendlier. Here, 46% of participants choose to share the pie equally. We find that more people abstain from choosing unequal distributions if this requires lying (Wilcoxon ranksum, p=0.02). This result is in line with previous studies that show that people have a preference for telling the truth, such as Hurkens and Kartik (2009), Charness and Dufwenberg (2006), Lundquist et al. (2009), Sánchez-Pagés and Vorsatz (2007), or Sánchez-Pagés and Vorsatz (2009).

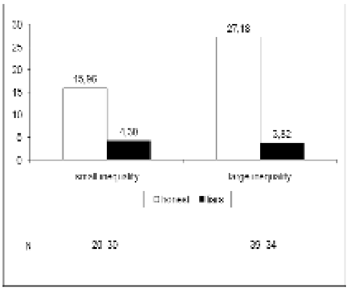

Figure 2: *Lie*: Deducted punishment points from player A by player B, Subset3

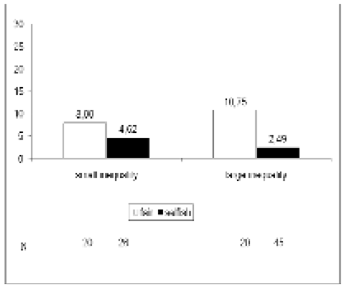

Figure 3: *Standard*: Deducted punishment points from player A by player B, Subset3

Participants in *Lie* could therefore be categorized into honest people and liars. Honest players are players who did not lie when they were player A, and therefore chose the equal split. Liars lied in order to choose one of the unequal splits. Figure 2 uses these two categories and distinguishes punishment by honest players from punishment by liars. Naturally, for *Standard*, Figure 3 differentiates between fair and selfish players.[9]

Figure 2 confirms Hypotheses 5 and 6. It shows that liars punish only a very small amount anyway and are not sensitive to the size of the lie (Wilcoxon ranksum, p=0.39). In contrast to liars` behavior, punishment by honest people is significantly higher for small inequalities (Wilcoxon ranksum, p<0.01) and also for large inequalities (Wilcoxon ranksum, p<0.01). Honest people react strongly to the size of a lie and punish large inequalities more than small ones (Wilcoxon ranksum, p<0.01). As the regressions 1 and 2 in Table 3 confirm, honest people (Variable IamLiar = 0) react stronger to the size of a lie than liars do (Variable IamLiar = 1). We conclude that the behaviour of the honest population explains the main effect of aversion against big lies.

9 We do not discuss the differences between fair and honest people because of differences in self-selection across the treatments.

VARIABLES	(1)	(2)
IamLiar	-18.28***	-11.66***
	(2.204)	(3.137)
Large inequality	5.308**	11.22***
	(2.192)	(4.014)
IamLiar×Large		-11.69***
		(4.299)
Constant	19.51***	15.96***
	(2.334)	(2.976)
Observations	129	129
R-squared	0.377	0.411

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Regression with Subset3, *Lie* only dependent variable: deducted punishment points from player A by player B, robust standard errors

We do not find these effects in S*tandard*. Here, punishment behavior of fair and selfish people does not differ. Neither fair nor selfish people react to the size of the inequality (Wilcoxon ranksum, p=0.50 and p=0.17). However, for intended large inequalities, fair people punish more strongly than unfair people do (Wilcoxon ranksum, p<0.01). This result is in line with Kahneman et al. (1986) who also find that people punish selfish choosers more often if they had not themselves been selfish choosers.

5. Conclusion

In a laboratory experiment we analyzed the impact of large and small lies *per se*, i.e. controlling for the resulting economic damage. Apart from a general liar aversion, we find that people are sensitive to the size of a lie. We also observe that a person's own attitude towards lying has a strong impact on punishment. Lying-averse people are also liar-averse. They additionally have a strong aversion to big lies. Dishonest people are soft punishers in any context.

The punishment of a lie is not just induced by a morale that is categorically against lying in any case (e.g. the Ten Commandments or the Kantian doctrine of virtue). The punishers seem to consider truth-telling as a valuable social norm. The punishment of big lies aims particularly at upholding this social norm. Theories of social preferences should therefore take into account that preferences for honesty shape negative reciprocity especially if people make gross misstatements about the truth.

6. Appendix – Instructions (Standard)

Welcome to this economic experiment.

Your decisions and possibly the decisions of the other participants in this experiment will influence your payoff. Therefore, it is important that you read these instructions carefully. **Throughout the entire experiment, it is not permitted to communicate with other participants**. Therefore, we ask you not to speak with one another. If you do not understand something, please take another look at the instructions. If you still have any questions, please raise your hand. We will then come to you and answer your question personally. During the experiment, we will not speak of Euros, but of points. Thus, your total income will initially be calculated in points. The total sum of points that you will have achieved at the end of this experiment will be converted into euros, where **1 point = 20 cents**. On the following pages, we will explain the exact procedure of the experiment. Every participant will receive the same instructions.

The Experiment

In this experiment, every participant fulfills two roles: every participant makes a decision in the role of participant A as well as in the role of participant B. At the end of the experiment, it will be randomly decided whether the decisions you made in role A or the ones you made in role B will be relevant for your payoff.

Procedure

Participant A receives between 20 and 100 points. Participant A then informs participant B how many points she will give to him. *Example:* A receives 100 points. She informs B that she will give 30 points to B. So A keeps 70 points for himself. But in 2/3 of the cases, participant B finds out the number of points that A has received. In this case mentioned here, B receives half of the points that A has received. If A does not spontaneously decide to give away half of the points that she has received, then B can eliminate some of A’s points. This aspect will be explained in more detail shortly. If participant B does NOT find out the number of points that A has really received, she will only receive the points that she has obtained by A. In this case, B cannot cross out points from A. *Example*: A receives 60 points. She informs B that she will give 10 of her points to him. If B finds out that A has received 60 points, B’s points will increase to 30. A’s points will decrease to 30. Furthermore, B can cross out points that belong to participant A. The deduction of points works as follows: B specifies how many of A’s points she wants to cross out. These points will be deducted from A's amount and will expire. In doing so, you cannot cross out more points than the amount of points that A already has. A negative number of points is not possible. However, the deduction of A's points entails costs for B. These costs consist of 20% of A's crossed-out points. If B has crossed out 15 of A's points, the number of B's points will decrease by 3 points. After all possible deductions have been carried out, all final decisions will have been made and it will be randomly decided which participant takes on role A or role B.

Procedure on the Computer

At first, everyone will make their decisions as participant A. You will be informed whether you have received 20, 60 or 100 points. The actual distribution works as follows: two participants in this experiment will receive 20 points each and two other people will receive 60 points each. The rest of the participants will receive 100 points each. Now you can decide how many points you would like to give away to participant B.

- If you have received 100 points, you can transfer one of the following to B: 50 points, 30 points, 10 points.
- If you have received 60 points, you can transfer one of the following to B: 30 points, 10 points.
- If you have received 20 points, you can transfer the following sum to B: 10 points.

Then, as participant B, you will find out which amount has been transferred to you by participant A. *Bear in mind*: the person who receives a transfer from you (you being participant A) will not be the same person who transfers a sum of points to you (you being participant B)! Afterwards, participant 1 randomly decides whether the number of points that A actually receives will be revealed to you, participant B. You will find out on the computer screen how this exactly works. If this number is not revealed to you, the number of points you already have will remain unchanged. If the number of points is revealed to you and A has transferred half of these points to you, your number of points will also remain unchanged. If the number of points is revealed and A has transferred less than half of these points to you, your number of points will change. In this case, participants A and B will both receive 50% of the revealed number of points. Furthermore, participant B can cross out points that belong to participant A. You just have to type in the amount of points that you want crossed out in the dialogue box on the screen. However, the deduction of A's points is entailed with costs for B. These costs consist of 20% of A's crossed-out points. Finally, it will be randomly decided whether your decision as participant A or your decision as participant B will be relevant for your payoff. You will find out on the computer screen how this exactly works.

7. Appendix – Instructions (Lie)

Welcome to this economic experiment.

Your decisions and possibly the decisions of the other participants in this experiment will influence your payoff. Therefore, it is important that you read these instructions carefully. **Throughout the entire experiment, it is not permitted to communicate with other participants**. Therefore, we ask you not to speak with one another. If you do not understand something, please take another look at the instructions. If you still have any questions, please raise your hand. We will then come to you and answer your question personally. During the experiment, we will not speak of Euros, but of points. Thus, your total income will initially be calculated in points. The total sum of points that you will have achieved at the end of this experiment will be converted into euros, where **1 point = 20 cents**. On the following pages, we will explain the exact procedure of the experiment. Every participant will receive the same instructions.

The Experiment

In this experiment, every participant fulfills two roles: every participant makes a decision in the role of participant A as well as in the role of participant B. At the end of the experiment, it will be randomly decided whether the decisions you made in role A or the ones you made in role B will be relevant for your payoff.

Procedure

Participant A receives between 20 and 100 points. Participant A then informs participant B how many points she has received. A has to give half of her ANNOUNCED points to B. A can also lie to B by telling him that she has received fewer points. In this case, A automatically gives 50% of her announced points to B and keeps the rest of her points. After that, B finds out the amount of points that A wants to inform him about. *Example:* A receives 100 points. She informs B that she has received 60 points. B receives half of the 60 points. So A gives 30 points to B and keeps 70 points for himself.

Afterwards, it is randomly decided whether participant B should find out the real amount of points that A has received. The computer screen will show you how this procedure exactly works. In 2/3 of the cases, participant B finds out the real number of points that A has received. In this case mentioned here, B receives half of the real number of points that A has received. If A does not tell him the correct number of points that she has received, then B can cross out some of A's points. This aspect will be explained in more detail shortly. If participant B does NOT find out the number of points that A has really received, she will only receive half of the points that she has been informed about. In this case, B cannot cross out points from A. *Example*: A receives 60 points. She informs B that she has received 20 points. Thus, she gives 10 of her points to B and keeps 50 points for himself. If B finds out that A has actually received 60 points, B's points will increase to 30. A's points will decrease to 30. Furthermore, B can cross out points that belong to participant A. The deduction of points works as follows: B specifies how many of A's points she wants to cross out. These points will be deducted from A's amount and will expire. In doing so, you cannot cross out more points than the amount of points that A already has. A negative number of points is not possible. However, the deduction of A's points entails costs for B. These costs consist of 20% of A's crossed-out points. If B has crossed out 15 points from A, the number of points for B will decrease by 3 points. After all possible deductions have been carried out, all final decisions will have been made and participant 1 will randomly decide which participant takes on role A or role B. You can find out on the computer screen how this exactly works.

Procedure on the Computer

At first, everyone will make their decisions as participant A. You will be informed whether you have received 20, 60 or 100 points. The actual distribution works as follows: two participants in this experiment will receive 20 points each and two other people will receive 60 points each. The rest of the participants will receive 100 points each. Now you can decide to tell B which number of points you have received.

- If you have received 100 points, you can tell B one of the following numbers: 100 points, 60 points, 20 points.
- If you have received 60 points, you can tell B one of the following numbers: 60 points, 20 points.

- If you have received 20 points, you can tell B the following number: 20 points.

Then, as participant B, you will find out which number of points A has received. You will also find out how many points you will receive (50% of the announced points). *Bear in mind*: the person who receives your statement (you being participant A) will not be the same person who tells you her statement (you being participant B)! Afterwards, it will be randomly decided whether the number of points that A actually receives will be revealed to you, participant B. If this number is not revealed to you, the number of points you already have will remain unchanged. If the number of points is revealed to you and the number corresponds to A's specified amount, your number of points will also remain unchanged. If the number of points is revealed and is larger than A's specified amount of points, your number of points will change. In this case, participants A and B will both receive 50% of the revealed number of points. Furthermore, participant B can cross out points that belong to participant A. You just have to type in the number of points that you want crossed out in the dialogue box on the screen. However, the deduction of A's points entails costs for B. These costs consist of 20% of A's crossed-out points. Finally, it will be randomly decided whether your decision as participant A or your decision as participant B will be relevant for your payoff.

8. References

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