Lying to Individuals versus Lying to Groups

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Discussion Paper No. 350

December 15, 2022

Collaborative Research Center Transregio 190 | www.rationality-and-competition.de
Ludwig-Maximilians-Universität München | Humboldt-Universität zu Berlin
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Lying to individuals versus lying to groups*

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December 14, 2022

Abstract

We investigate experimentally whether individuals or groups are more lied to, and how lying depends on the group size and the monetary loss inflicted by the lie. We employ an observed cheating game, where an individual's misreport of a privately observed number can monetarily benefit her while causing a loss to either a single individual, a group of two or a group of five. As the privately observed number is known to the experimenter, the game allows to study both, whether the report deviates from the observed number and also by how much. Treatments either vary the individual loss caused by a given lie (keeping the total loss constant), or the total loss (keeping the individual loss constant). We find more lies toward individuals than toward groups. Liars impose a larger loss with their lie when that loss is split among group members rather than borne individually. The size of the group does not affect lying behavior.

Keywords: cheating; lying; groups; observed cheating game; laboratory experiment
JEL codes: C91; D82; D91

*Financial support by Deutsche Forschungsgemeinschaft through CRC TRR 190 "Rationality and Competition" (project number 280092119) as well as support by the Berlin Centre for Consumer Policies (BCCP) are gratefully acknowledged. The experiments reported in this paper have been approved by the management of the Experimental Laboratory at Technische Universität Berlin.

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1 Introduction

Asymmetric information is common in everyday life and individuals may feel tempted to use their informational advantage to earn money at the expense of less informed others. Examples include financial advisors recommending unsuitable products to their clients to earn higher bonuses, car mechanics charging for an expensive repair, which they did not conduct, or a tax payer, contemplating whether to commit tax fraud. While in the first two cases deception is directed toward a single individual, in the last case it is directed toward the state, which can be thought of as a group of individuals. This paper investigates whether people lie more to individuals or to groups, whether lying depends on the group size, and whether potential liars care whether the monetary loss imposed by their lie is borne by each group member to the full extent individually or shared equally with the other group members.

As an illustration, consider the following three scenarios. In the "single individual" scenario, an individual can cheat to obtain 100 euros at the expense of another individual losing 100 euros. In the "group" scenarios, an individual can cheat to obtain 100 euros either at the expense of a group of 100 individuals each losing 100 euros or at the expense of a group of 100 individuals each losing 1 euro. We want to compare the "single individual" scenario to each of the "group" scenarios, assuming that for the liar, the cost of lying increases in the monetary loss inflicted by the lie and in the number of people being deceived.

When each group member loses 100 euros, the individual loss by the lie is the same as in the "single individual" scenario, whereas the total loss, i.e., the individual loss multiplied by the number of group members, is huge. In addition, in the "group" scenario, the immoral act of lying is committed against many individuals as opposed to only one individual in the "single individual" scenario, which may also increase the cost of lying. Therefore, we expect that deception directed toward groups will be less frequent than toward individuals.

When each group member loses 1 euro, the outcome of the comparison between the "single individual" scenario and the "group" scenario is less clear. On the one hand, the single individual loses as much as all group members together. Since the individual loss borne by the single individual is huge compared to the individual loss borne by each group member, groups should be deceived more than individuals. On the other hand, cheating many may be morally more costly than cheating one, leading to the conjecture that groups should be deceived less than individuals. Which effect will prevail is an empirical question.

We conduct a controlled laboratory experiment to investigate whether individuals lie more to other individuals or to groups, and how lying depends on the size of the group and on the loss caused by the lie. We employ an observed cheating game, where an individual's misreport of a privately observed number can monetarily benefit her while causing a loss to the 'other side'. The other side is either a single individual, a group of two or a group of five. As the privately observed number is known to the experimenter, the game allows to study both, whether the report deviates from the observed number, i.e., the frequency of lying, and by how much, i.e., the size of the lie. The size of the lie is equivalent to the size of the loss imposed on the other side.

In half of the treatments, a given lie causes the same loss at the individual level, therefore the total loss increases in the number of people that are lied to (which can be one, two, or five). Additionally, lying many people at the same time is probably morally more costly for the liar than lying one. Therefore, we expect less lies toward groups of five than toward groups of two, and less lies toward groups of two than toward individuals.

In the other half of the treatments, we keep the loss by a given lie equal for the 'other side', meaning that when the other side is a single individual, that individual bears the whole loss, whereas, whenever the other side is a group, the same loss is shared equally among group members. Consequently, the individual loss falls in the number of people lied to (which can be one, two, or five). Therefore, we expect less lies toward individuals than toward groups of two, and less lies toward groups of two than toward groups of five. However, if the disutility from lying increases in the number of people being cheated, the opposite will follow, i.e., individuals will be cheated most, followed by groups of two, and groups of five will be cheated least. We acknowledge that this part of our study is rather explorative.

We find more instances of lying toward individuals than toward groups, independently of the group size and independently of whether the loss caused by the lie is borne by each group member or shared among group members. It seems that what matters most for the binary decision to lie is the immoral act of being dishonest to multiple others. Moreover, the disutility from lying to many seems not a linear function of their number (for small numbers) but rather binary. Lying to two is as bad as lying to five. It is an open and intriguing question, whether this finding will translate to even larger groups, i.e., whether people will show a similar aversion to cheating five versus cheating five hundred.

We also find that conditional on the decision to lie, bigger lies are told and hence a larger loss is caused to groups than to individuals, when that loss is split among group members and thus the individual payoff of the victims does not suffer that much. Thus, even lairs remain sensitive to the loss their lie imposes at the individual level. This is in line with previous findings, see, e.g., Gneezy (2005). In contrast, lies of similar size are told and thus similar loss is caused to individuals and group members who bear the full loss alone like the individual who is not part of a group. Thus, for the decision on how big to lie, liars care for the loss at the individual level but not so much for the total loss.

Previous literature has considered lying to a single individual versus lying to a group, where the group is represented either by the organization of the experimenter, i.e., an experimental budget (Gneezy and Kajackaite (2020), Soraperra et al. (2019), Meub et al. (2016), Fischbacher and Föllmi-Heusi (2013)), a fictitious company (Bersoff, 1999), or a group of actual individuals (Amir et al., 2016). These studies either find no difference in lying behavior toward victims of different kind or they find that individuals are cheated less than groups.

In contrast to most of the previous research, we study lying to a single individual versus lying to an actual group of individuals, participating in the same experiment. Therefore, the study that is closest to ours is by Amir et al. (2016). However, their approach differs from ours in several important ways. Amir et al. (2016) use a game that does not allow to observe behavior at the individual level, do not vary the group size, conduct an online experiment, and pay 10% of participants. Our game enables us to observe the individual decision by each participant. Furthermore, we vary the group size, which allows us to explore possible differences in lying toward small versus large groups. Finally, we conduct our experiment in the laboratory, and pay all participants.

The next section presents the experimental design. Section 3 describes the behavioral predictions. Section 4 presents the experimental results, and section 5 concludes.

2 Experimental design and procedure

We employed a modified version of the observed cheating game introduced by Gneezy et al. (2018). A participant (sender) privately observed a random draw from an uniform distribution of integers from 1 to 10 and was required to report the observed number. Senders knew that their report (r) would be identical to their payoff in euros. Depending on the treatment, senders were matched with either one, two, or five receivers. Again, depending on the treatment, each receiver either got a payoff of $11-r$ euros or a payoff of $(11-r) : n$ euros, where n stands for the number of receivers. Table 1 provides an overview of the treatments and the number of independent observations per treatment.

Receiver's payoff	One receiver	Two receivers	Five receivers
$11 - r$	ONE, N=114	TWO, N=117	FIVE, N=120
$(11 - r) : n$		TWOsplit, N=117	FIVEsplit, N=120

Table 1: Treatments and number of independent observations (r is the reported number, n is the number of receivers, N is the number of independent observations per treatment)

It was common knowledge that the experimenter would be aware both of the observed number and the reported number. The payoffs of senders and receivers were chosen such that senders and receivers had opposing interests, i.e., a higher payoff for the sender automatically implied a lower payoff for the receiver/s.

Table 2 shows how the individual payoff and the total payoff of receivers depend on the reported number in each treatment. Any given report yields the same individual payoff for receivers in treatments ONE, TWO, and FIVE, while their total payoff is highest in FIVE, lower in TWO, and lowest in ONE. Any given report leads to the same total payoff for receivers in treatments ONE, TWOsplit, and FIVEsplit, while the individual payoff for receivers is highest in ONE, lower in TWOsplit, and lowest in FIVEsplit.

Low reports in TWO and especially in FIVE lead to large efficiency gains, high reports, respectively, to large efficiency losses. Efficiency is not an issue in treatments ONE, TWOsplit, and FIVEsplit.

treatment	report(=payoff sender)	1	2	3	4	5	6	7	8	9	10
ONE, TWO, FIVE	individual payoff receivers	10	9	8	7	6	5	4	3	2	1
TWO	total payoff receivers	20	18	16	14	12	10	8	6	4	2
FIVE	total payoff receivers	50	45	40	35	30	25	20	15	10	5
ONE, TWOsplit, FIVEsplit	total payoff receivers	10	9	8	7	6	5	4	3	2	1
TWOsplit	individual payoff receivers	5	4.5	4	3.5	3	2.5	2	1.5	1	0.5
FIVEsplit	individual payoff receivers	2	1.8	1.6	1.4	1.2	1	0.8	0.6	0.4	0.2

Table 2: Individual payoffs and total payoffs across treatments

Initially, participants were not informed which role had been assigned to them. Therefore, all of them were required to report the number they saw, i.e., we used the strategy method (Selten, 1967). After the reports were made, participants were informed about their role and payoff. After this one-shot game, participants filled a short post-experiment questionnaire that contained questions on age, gender, field of study, and motives for their decision.

To keep the effect of chance equal across treatments, the random draw of the numbers that participants observed was determined for one treatment and used in all other treatments. We employed a between-subjects design, i.e., no participant took part in more than one treatment. The experiment took place at the Berlin Experimental Economics Laboratory in the summer of 2019 and the fall of 2021. We recruited a total of 588 participants using ORSEE (Greiner, 2015). The experiment was programmed in z-Tree (Fischbacher, 2007). An experimental session lasted approximately 30 minutes. The average payoff was 10.73 euros, including a show-up fee of 5 euros, and a flat payment of 1.5 euros for filling out the post-experiment questionnaire. Upon arrival in the laboratory, participants were randomly assigned to cubicles. Then they read the instructions (see Appendix A for the instructions), and answered a short quiz checking their understanding of the game. During the whole experiment, participants were allowed to ask questions privately. After deciding on their report and filling the questionnaire on demographics, the experiment ended. All participants were paid privately in cash and left the laboratory.

3 Behavioral predictions

In our setting, selfish participants will always report a ten, while honest participants will always report the observed number. Many other participants will have those two motivations to some extent, and will possibly also care about equality as well as efficiency, and will thus trade off their own benefit from a given report against the loss caused to others. More specifically, efficiency concerns will drive down reports in treatments TWO and FIVE (in all other treatments, efficiency will not be an issue). Inequality aversion will lead to reports of (or close to) 6 in treatments ONE, TWO, and FIVE, 4 in treatment TWOsplit, and 2 in treatment FIVEsplit (see Table 2). Consequently, we expect to observe truthful reports (i.e., reports, that coincide with the observed number), under-reports (i.e., reports that are below the observed number and thus benefit the receiver/s at the expense of the sender), and over-reports (i.e., reports that are above the observed number and thus benefit the sender at the expense of the receiver/s). Although lying includes both under-reports as well as over-reports, in this study we are mainly interested in the lies that benefit the liar. Therefore, we will focus on the over-reports.

	Individual loss from over-report	Total loss from over-report
FIVE	$r-o$	$(r-o)\cdot 5$
TWO	$r-o$	$(r-o)\cdot 2$
ONE	$r-o$	$r-o$
TWOsplit	$(r-o):2$	$r-o$
FIVEsplit	$(r-o):5$	$r-o$

Table 3: Individual loss versus total loss caused to receiver/s when sender's report (r) is higher than the observed number (o) by treatment

Table 3 shows the individual loss and the total loss that a given over-report causes to receivers. Comparing treatments ONE, TWO and FIVE, it is evident that the individual loss is equal across treatments whereas the total loss is higher in FIVE than in TWO, and it is higher in TWO than in ONE. Consequently:

Hypothesis 1 *If people care for the total loss caused by their lie, large groups will be exposed* *to less and smaller over-reports than small groups, which in turn will be exposed to less and smaller over-reports than individuals.*

Now compare treatments ONE, TWOsplit and FIVEsplit. While the total loss from a given over-report is constant, the individual loss is highest in ONE, followed by TWOsplit, and finally FIVEsplit. Therefore:

Hypothesis 2 *If people care for the individual loss caused by their lie, large groups will be exposed to more and larger over-reports than small groups, which in turn will be exposed to more and larger over-reports than individuals.*

So, depending on the individual loss and the total loss, we have opposing predictions about lying to individuals versus lying to groups.

It is also possible that lying to many people at the same time is considered morally less appropriate than lying to a single individual. If this is the case, it is still not clear, whether the appropriateness is dependent or independent of the group size, and how it interferes with the monetary loss caused by the lie. Therefore, we are not going to state a hypothesis related to this issue, but will rather let the data speak to us.

4 Results

We start with descriptives and proceed with econometric tests of our hypotheses.

4.1 Descriptive statistics

Figure 1 depicts the distributions of reported numbers (gray bars) and observed numbers (white bars) by treatment. In all treatments the reported numbers are significantly higher than the numbers participants actually saw ($p < 0.001$, two-sided Wilcoxon signed-rank tests, all tests in the paper are two-sided). Furthermore, the lower the number participants saw, the more likely they were to over-report (the Spearman's rank correlation coefficient is negative and highly significant in all treatments, $p < 0.001$). The frequency of reported tens is lowest in treatments TWO and FIVE, and highest in treatment FIVEsplit but none of this is significant. In all treatments, there are spikes of reports around the fair outcomes (which is 6 in treatments ONE, TWO, and FIVE, 4 in treatment TWOsplit, and 2 in treatment FIVEsplit).

Figure 2 portrays the share of over-reports, truthful reports, and under-reports by treatment. The share of over-reports is highest in treatment ONE (56%). In the group-treatments,

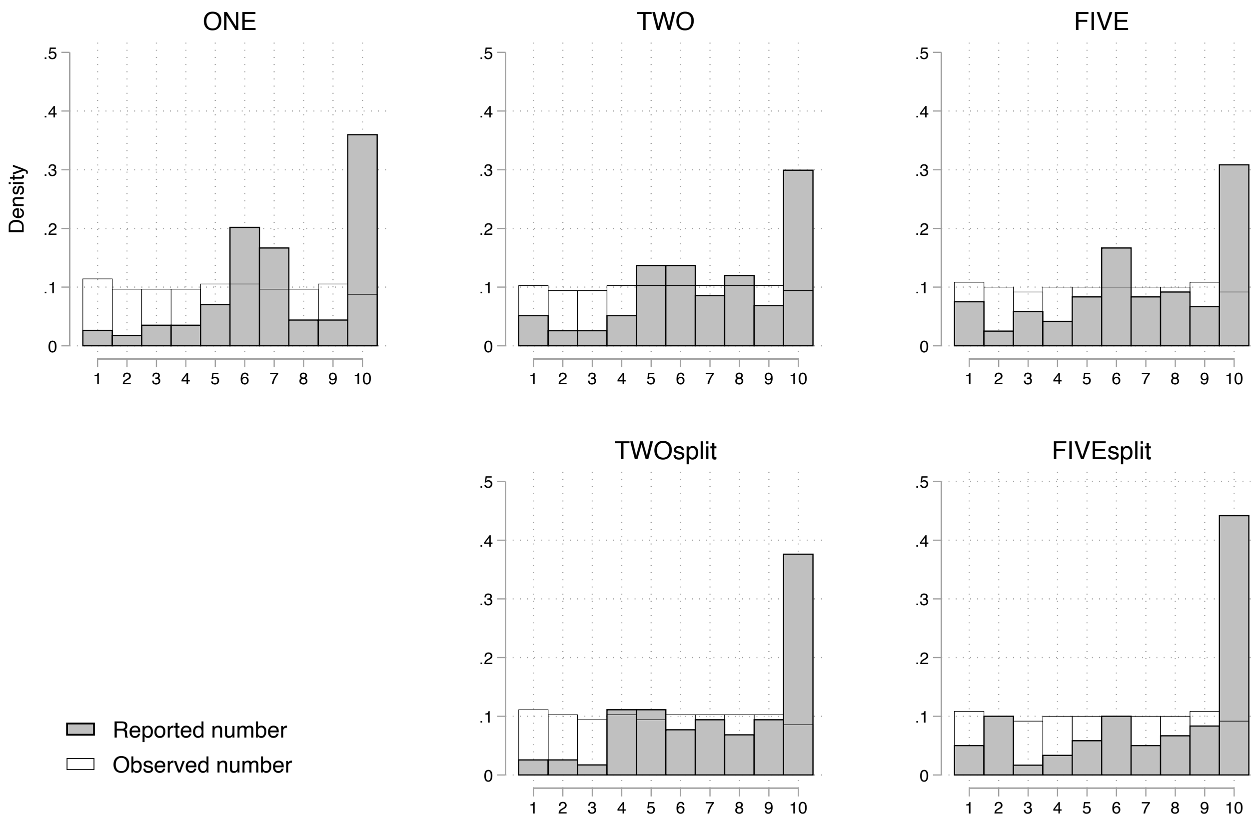

Figure 1: Reported numbers and observed numbers by treatment.

between 44% and 47% of participants over-reported. We also observe a non-negligible share of under-reports, which is between 13% and 15%.

Figure 3 presents the average size of over-reports and under-reports by treatment conditional on the decision to lie. The average size of over-reports is higher in treatments TWOsplit and FIVEsplit (both around 5 euros) than in treatments ONE, TWO, and FIVE (all around 4 euros). We show the average size of under-reports for completeness.

4.2 Econometric analysis

This section considers over-reports only. We will use the terms 'over-report', 'lying', 'cheating', and 'lie' interchangeably.

Result 1 *Individuals are more frequently cheated than groups. The frequency of lies is similar across groups.*

Table 4 provides econometric support for Result 1. It shows results from logistic regressions with the binary decision to over-report as the dependent variable. Specification (1) investigates how the decision to over-report depends on the number of receivers by including

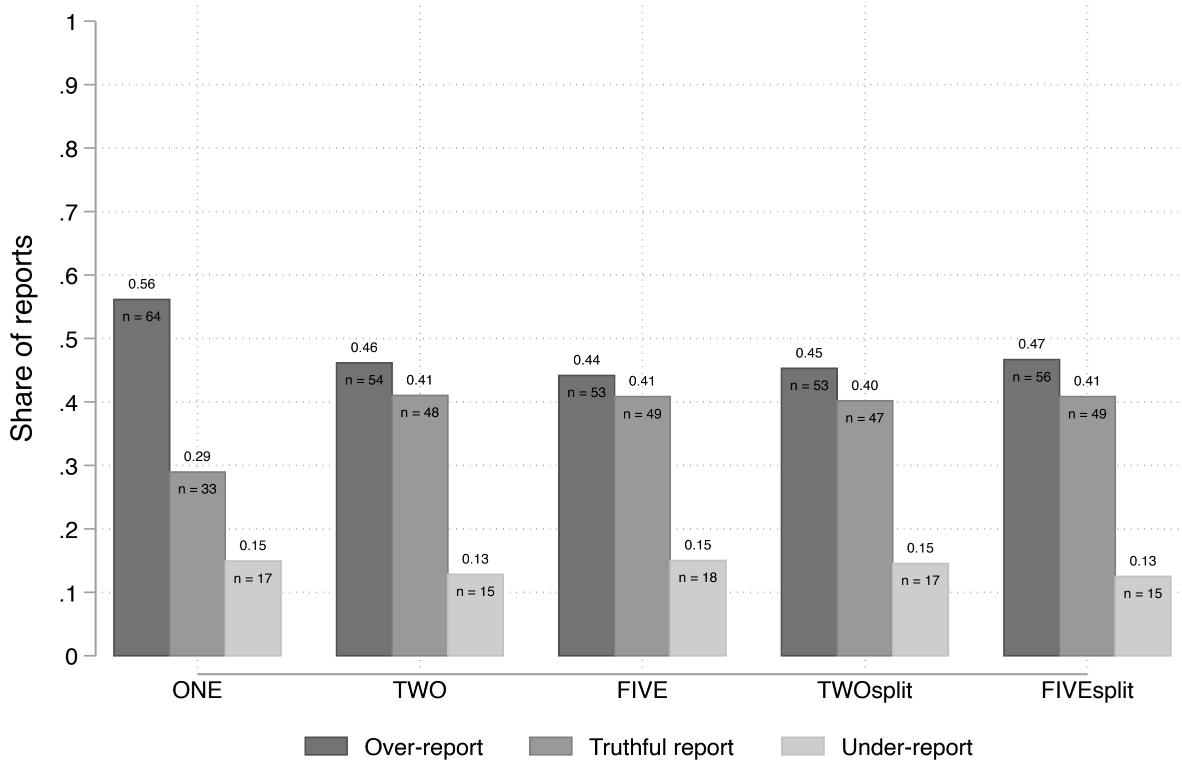

Figure 2: The share of over-reports, truthful reports, and under-reports by treatment.

the Two receivers–dummy (that takes the value one, if the treatment is TWO or TWOsplit and zero otherwise), and the Five receivers–dummy (that takes the value one, if the treatment is FIVE or FIVEsplit and zero otherwise). Specification (2) adds the Split–dummy (that takes the value one, if the treatment is TWOsplit or FIVEsplit and zero otherwise) to explore a possible difference in the frequency of over-reports between the split-treatments and the rest of the treatments. Finally, in specification (3) we incorporate the interaction Two receivers $\times$ Split–dummy (that takes the value one, if the treatment is TWOsplit and zero otherwise) to enable the pairwise comparison between treatments using post-estimation Wald tests. In all specifications, we control for the age, the gender, and the field of study of participants.

The probability to over-report is significantly lower, when there are two or five receivers compared to one receiver, see the significantly negative dummy variables in (1). Whether or not the loss is split among group members does not affect the probability to over-report when controlling for the group size: the Split-dummy in (2) is not significant. The post-estimation Wald-tests related to specification (3) confirm what we have seen on Figure 2: the probability to over-report is significantly higher in treatment ONE than in all other treatments, i.e.,

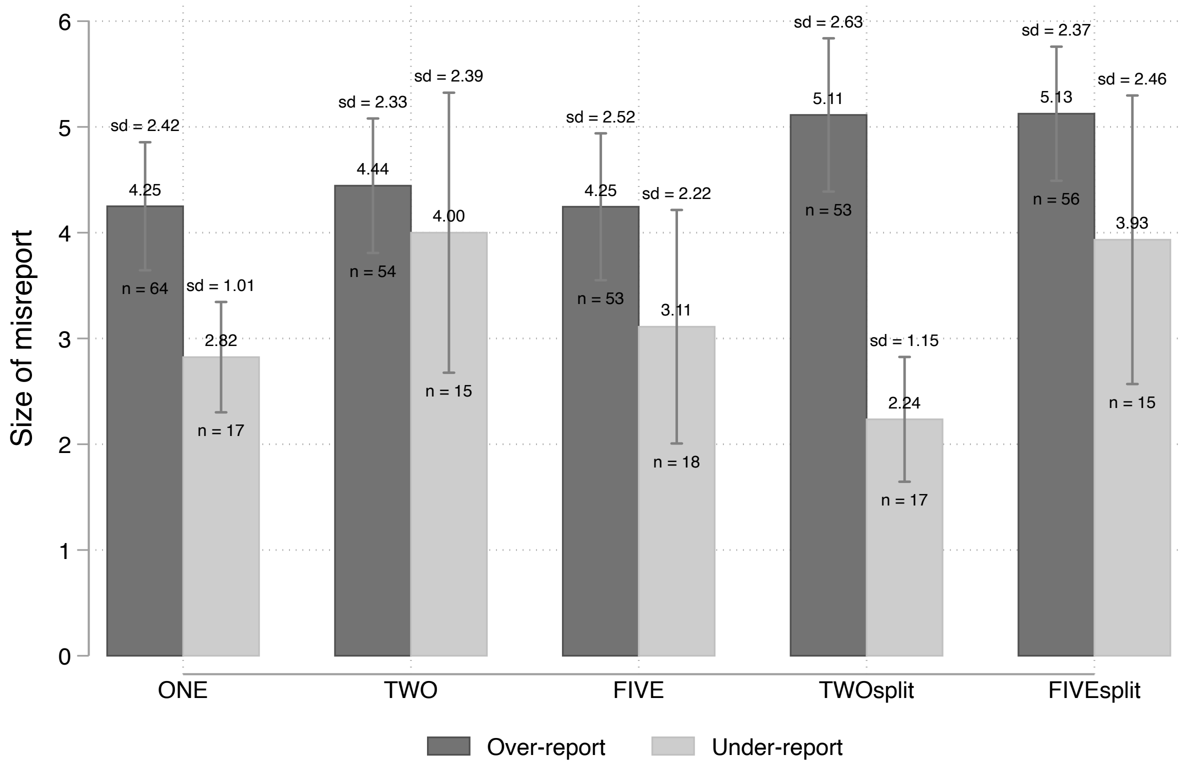

Figure 3: Average size of over-reports and under-reports by treatment.

individuals are cheated more frequently than groups ($p \leq 0.07$ for all pairwise comparisons). We do not find any differences in the probability to over-report when pairwise comparing the relevant group treatments, i.e., the probability to over-report does not differ between groups of different sizes.[1]

Result 2

(i) Conditional on the decision to over-report, over-reports toward groups whose members share the loss are larger in size than over-reports toward individuals who bear the loss alone. The group size does not affect the average size of over-reports.

(ii) Over-reports toward individuals are similar in size to over-reports toward group members who do not share the loss but bear it alone.

Table 5 provides support for Result 2. It presents results from OLS regressions with the size of over-reports as the dependent variable.[2] The three model specifications in Table 5 have exactly the same set of regressors and control variables as in Table 4.

[1] All results based on post-estimation Wald tests were confirmed with Fisher exact tests and t-tests.

[2] We obtain similar results with ordered logit regressions.

	Dependent variable: Over-report $\in \{0,1\}$		
	(1)	(2)	(3)
Two receivers–dummy	-0.543**	-0.558**	-0.545*
	(0.257)	(0.275)	(0.292)
Five receivers–dummy	-0.556**	-0.571**	-0.584**
	(0.256)	(0.275)	(0.292)
Split–dummy		0.029	0.055
		(0.198)	(0.279)
Two receivers $\times$ Split–dummy			-0.053
			(0.397)
Constant	0.662***	0.662***	0.662***
	(0.215)	(0.215)	(0.215)
Observations	506	506	506
Postestimation Wald tests to compare treatments:			
H_0: TWO = ONE			$p = 0.06$
H_0: FIVE = ONE			$p = 0.05$
H_0: TWOsplit = ONE			$p = 0.06$
H_0: FIVEsplit = ONE			$p = 0.07$
H_0: TWO = FIVE			$p = 0.89$
H_0: TWOsplit = FIVEsplit			$p = 0.96$
H_0: TWO = TWOsplit			$p = 0.99$
H_0: FIVE = FIVEsplit			$p = 0.84$

Logistic regressions, standard errors in parentheses, under-reports are excluded, controls: age, gender and field of study, *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

Table 4: Frequency of over-reports across treatments.

Specification (1) indicates that there is no difference between the average size of over-reports toward groups and toward individuals (both dummies are insignificant). The positive and significant coefficient of the Split-dummy in specification (2) suggests that the average over-report is larger in TWOsplit and FIVEsplit than in all other treatments. The post-estimation Wald tests related to specification (3), show that (i) the average over-report is similar in treatments ONE, TWO, and FIVE ($p \geq 0.49$), (ii) the average over-report is larger both in TWOsplit and FIVEsplit than in ONE ($p \leq 0.09$), (iii) the average over-report is similar in TWOsplit and FIVEsplit ($p = 0.84$).

To sum up, when it comes to the binary decision to lie, groups are cheated less than individuals. When the border to lie is crossed, groups are told either similar lies or 'bigger' lies than individuals. Our first result is partially in line with H1 and at odds with H2, but it supports our conjecture about the existence of a norm of cheating groups less. Our second result rejects H1, partially supports H2, and indicates that liars care for the individual loss but not for the total loss inflicted by their lie.

	Dependent variable: Size of over-report $\in \{1, \ldots, 9\}$		
	(1)	(2)	(3)
Two receivers–dummy	0.579	0.237	0.318
	(0.403)	(0.432)	(0.462)
Five receivers–dummy	0.534	0.175	0.095
	(0.393)	(0.437)	(0.469)
Split–dummy		0.682**	0.841*
		(0.344)	(0.477)
Two receivers × Split–dummy			-0.323
			(0.703)
Constant	3.490***	3.530***	3.507***
	(0.811)	(0.794)	(0.798)
Observations	280	280	280
Postestimation Wald tests to compare treatments:			
H_0: TWO = ONE			$p = 0.49$
H_0: FIVE = ONE			$p = 0.84$
H_0: TWOsplit = ONE			$p = 0.09$
H_0: FIVEsplit = ONE			$p = 0.04$
H_0: TWO = FIVE			$p = 0.64$
H_0: TWOsplit = FIVEsplit			$p = 0.84$
H_0: TWO = TWOsplit			$p = 0.31$
H_0: FIVE = FIVEsplit			$p = 0.08$

OLS regression, standard errors in parentheses, only over-reports are considered, controls: age, gender, and field of study, *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

Table 5: The size of over-reports.

5 Discussion and conclusion

In everyday situations with asymmetric information and conflict of interest, better informed individuals may deceive to earn money at the expense of less informed others. In this study we ask: Does it make a difference whether the victim of a potential lie is a single individual or a group of individuals? Are larger groups subject to more deception than smaller groups? Do potential lairs care about whether the loss caused by their lie is borne by each group member or shared equally among group members?

Employing a controlled laboratory experiment, we find that individuals are more frequently deceived than groups. That is independent of the group size and of whether the loss caused by the lie is borne by each group member or shared equally among group members. Those, who decide to cheat, (i) cause a similar loss to individuals and to group members who bear the loss individually, (ii) inflict a larger loss to groups in which members share the loss than to individuals.

Our findings suggest that for the binary decision to lie, the monetary loss caused by the lie does not matter much. What matters is the aversion to deceiving many people at the same time, independently of their number or how they are monetarily harmed. This part of our findings is at odds with Amir et al. (2016). We conjecture that there is a norm to cheat groups less. Further research is needed to better understand this issue.

Once the decision to lie is made, liars care for the individual loss they cause (but not for the total loss), and thus tell bigger lies causing larger loss when that loss is shared among the deceived and is therefore small. This is in line with what we expected and also with previous research (Gneezy, 2005).

One practical implication of our findings is that you should appear together with other people when facing a situation with asymmetric information and conflict of interest since this might decrease the probability of being lied to. However, if you know that you are likely to be cheated anyway, it is better to show up alone, since this might decrease the size of the lie.

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Appendix

Appendix A. Instructions

The original instructions, which are available upon request, were in German. Below, we provide a translation and indicate the differences between treatments with text in italics. The text in bold was bold in the original instructions. Part two of the instructions was a questionnaire on demographics.

Please read these instructions carefully. If you don't understand something, please show it by raising your hand. We will then come to you and answer your questions privately.

Please do not communicate with other participants during the experiment.

The instructions are identical for all participants.

You will make your decisions on the computer.

All decisions remain anonymous. This means that you will not learn the identity of other participants and no participant will learn your identity.

The experiment consists of two parts. The two parts are independent of each other. This means that your decisions in the first part will not affect your earnings in the second part and vice versa. At the beginning of each part you will receive detailed instructions, for part one on paper, for part two on your computer screen.

In each part of the experiment you will earn money. How exactly you will earn money is described in the instructions.

Your earnings in this experiment (i.e., the sum of your earnings from both parts) will be paid to you privately and in cash at the end of the experiment.

For your punctual appearance and regardless of your decisions in the experiment, you will receive a participation bonus of 5 €.

Part 1

Your task

Ten boxes will appear on your computer screen. The boxes contain the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The numbers are hidden in the boxes and the order of the boxes is random. That means, you won't know which number is hidden in which box. Once you click on a box, you will see the number it contains.

You are supposed to click on the box of your choice to see the number inside. You will then be asked what number you saw. **Your task is to decide what number you want to report.** No other participant will know what number you saw. You will also not know what numbers the other participants saw. Part one consists of this single decision.

Two roles for participants

Each participant will be randomly assigned to a role A or B. Each participant A will also be randomly matched to *one participant B./two participants B; we will call them B1 and B2./five participants B; we will call them B1, B2, B3, B4 and B5.* You will make your decision without knowing whether you have role A or role B. After you have made your decision, you will be informed about your role.

Earnings

Participant A's decision determines the earnings of both Participant A and *participant B/the two participants B/the five participants B that is/are matched to A.* The table below shows the earnings Participant A and Participant B will each receive, depending on the number that Participant A reported.

Treatment ONE

A reported	1	2	3	4	5	6	7	8	9	10
A gets	1 €	2 €	3 €	4 €	5 €	6 €	7 €	8 €	9 €	10 €
B gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €

Treatment TWO

A reported	1	2	3	4	5	6	7	8	9	10
A gets	1 €	2 €	3 €	4 €	5 €	6 €	7 €	8 €	9 €	10 €
B1 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €
B2 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €

Treatment TWOsplit

A reported	1	2	3	4	5	6	7	8	9	10
A gets	1 €	2 €	3 €	4 €	5 €	6 €	7 €	8 €	9 €	10 €
B1 gets	5 €	4.5 €	4 €	3.5 €	3 €	2.5 €	2 €	1.5 €	1 €	0.5 €
B2 gets	5 €	4.5 €	4 €	3.5 €	3 €	2.5 €	2 €	1.5 €	1 €	0.5 €

Treatment FIVE

A reported	1	2	3	4	5	6	7	8	9	10
A gets	1 €	2 €	3 €	4 €	5 €	6 €	7 €	8 €	9 €	10 €
B1 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €
B2 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €
B3 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €
B4 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €
B5 gets	10 €	9 €	8 €	7 €	6 €	5 €	4 €	3 €	2 €	1 €

Treatment FIVEsplit

A reported	1	2	3	4	5	6	7	8	9	10
A gets	1 €	2 €	3 €	4 €	5 €	6 €	7 €	8 €	9 €	10 €
B1 gets	2 €	1.8 €	1.6 €	1.4 €	1.2 €	1 €	0.8 €	0.6 €	0.4 €	0.2 €
B2 gets	2 €	1.8 €	1.6 €	1.4 €	1.2 €	1 €	0.8 €	0.6 €	0.4 €	0.2 €
B3 gets	2 €	1.8 €	1.6 €	1.4 €	1.2 €	1 €	0.8 €	0.6 €	0.4 €	0.2 €
B4 gets	2 €	1.8 €	1.6 €	1.4 €	1.2 €	1 €	0.8 €	0.6 €	0.4 €	0.2 €
B5 gets	2 €	1.8 €	1.6 €	1.4 €	1.2 €	1 €	0.8 €	0.6 €	0.4 €	0.2 €

In other words, suppose participant A reported **X**. Then participant A's earnings are equal to **X €**. *Participant B/Each participant B* with whom A is matched gets ***(11-X) €/(11-X)/2 €/(11-X)/5 €***.

Finally, you will be informed about your role and your earnings. Then part one will end.

The sequence of events in part one at a glance:

1. Click on a box, see the number inside.
2. Decide what number you want to report.
3. Learn your role and your payoff.

Part 2

Please answer the following questions. You will be paid 1.5 euros.

Appendix B. Frequency of reported numbers by observed numbers in treatments ONE, TWO, & FIVE

ONE		Reported number									
		1	2	3	4	5	6	7	8	9	10
Observed number	1	2	0	1	0	0	3	2	0	0	5
	2	0	2	0	0	2	2	1	0	0	4
	3	0	0	3	0	0	3	1	0	0	4
	4	0	0	0	4	0	2	2	0	0	3
	5	0	0	0	0	1	1	4	1	0	5
	6	1	0	0	0	0	3	4	0	1	3
	7	0	0	0	0	3	1	3	0	0	4
	8	0	0	0	0	1	2	0	4	0	4
	9	0	0	0	0	1	4	1	0	4	2
	10	0	0	0	0	0	2	1	0	0	7

TWO		Reported number									
		1	2	3	4	5	6	7	8	9	10
Observed number	1	3	0	0	0	3	2	1	1	0	2
	2	0	2	0	1	1	1	0	0	0	6
	3	0	0	3	0	2	1	1	1	0	3
	4	0	0	0	4	2	1	0	1	0	4
	5	0	0	0	0	4	1	0	2	1	4
	6	0	0	0	0	2	5	1	1	0	3
	7	1	0	0	0	0	1	6	0	1	3
	8	1	1	0	0	0	1	0	8	0	1
	9	0	0	0	1	1	1	1	0	6	2
	10	1	0	0	0	1	2	0	0	0	7

FIVE		Reported number									
		1	2	3	4	5	6	7	8	9	10
Observed number	1	2	0	0	0	1	2	2	2	0	4
	2	1	3	1	0	2	2	0	0	0	3
	3	1	0	4	1	0	1	0	1	0	3
	4	3	0	0	3	1	2	0	0	0	3
	5	0	0	1	0	4	1	1	2	0	3
	6	0	0	0	0	2	6	1	1	1	1
	7	0	0	1	0	0	1	6	0	0	4
	8	0	0	0	1	0	2	0	5	0	4
	9	1	0	0	0	0	2	0	0	7	3
	10	1	0	0	0	0	1	0	0	0	9

Frequency of reported numbers by observed numbers in treatments ONE, TWOsplit, & FIVEsplit

ONE	Reported number									
Observed number	1	2	3	4	5	6	7	8	9	10
1	2	0	1	0	0	3	2	0	0	5
2	0	2	0	0	2	2	1	0	0	4
3	0	0	3	0	0	3	1	0	0	4
4	0	0	0	4	0	2	2	0	0	3
5	0	0	0	0	1	1	4	1	0	5
6	1	0	0	0	0	3	4	0	1	3
7	0	0	0	0	3	1	3	0	0	4
8	0	0	0	0	1	2	0	4	0	4
9	0	0	0	0	1	4	1	0	4	2
10	0	0	0	0	0	2	1	0	0	7

TWOsplit	Reported number									
Observed number	1	2	3	4	5	6	7	8	9	10
1	1	0	0	1	3	0	1	0	0	7
2	1	3	0	1	0	0	0	1	2	4
3	0	0	2	0	1	0	1	0	1	6
4	0	0	0	5	1	1	1	0	0	4
5	1	0	0	2	4	0	0	0	0	4
6	0	0	0	2	1	5	0	0	1	3
7	0	0	0	1	1	1	8	0	0	1
8	0	0	0	0	2	1	0	5	1	3
9	0	0	0	1	0	1	0	0	6	4
10	0	0	0	0	0	0	0	2	0	8

FIVEsplit	Reported number									
Observed number	1	2	3	4	5	6	7	8	9	10
1	5	0	0	0	1	1	0	0	1	5
2	0	6	0	0	0	0	0	1	1	4
3	0	1	1	0	1	1	0	0	0	7
4	0	1	1	2	0	1	0	0	1	6
5	0	1	0	0	2	0	1	0	0	8
6	0	0	0	0	0	7	0	1	0	4
7	0	1	0	0	1	1	5	0	0	4
8	0	0	0	1	1	0	0	6	0	4
9	1	1	0	0	0	1	0	0	7	3
10	0	1	0	1	1	0	0	0	0	8