Lying and Team Incentives

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ABSTRACT

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We investigate the influence of two widespread compensation schemes, individual piece-rates and team incentives, on participants' inclination to lie, by adapting the experimental setup of Fischbacher and Heusi (2008). Lying turns out to be more pronounced under team incentives than under individual piece-rates, which highlights a so far fairly neglected feature of these compensation schemes.

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1 Introduction

Deception and lying is common in all kinds of social interaction (Bok, 1999; Feldman, 2009) and recently, this topic also raised considerable interest in the experimental economics literature (Croson, 2005). Gneezy (2005), for example, investigates the role of consequences on the inclination of lying and finds that people deceive more often the higher the own profit from lying and the lower the loss for the deceived person (for an extension see Sutter, 2009). Schweitzer and Hsee (2002) point out that people tend to justify lying more easily when other people benefit from dishonest behavior. Charness and Dufwenberg (2006) identify guilt aversion as an important inhibitor to tame the temptation of deceiving others. In a simple and ingenious die-rolling game Fischbacher and Heusi (2008), henceforth F&H, find that people systematically over-report the true value of a private die-roll when the reported number determines their individual pay. Interestingly, people seem not to exaggerate their claims to the full extent what the authors call 'incomplete lying'. This result is in line with the idea of 'self-concept maintenance' investigated by Mazar, Amir, and Ariely (2008). They argue that lying to a small extent does not necessarily require changing one's self-image as an honest person.

In this paper we take an organizational economics perspective and look at the influence of compensation schemes on deceptive behavior and lying. Such a perspective is also taken by Cadsby, Song, and Tapon (2010) who employ an anagram task and experimentally analyze the differences in cheating under piece-rate, target-based and tournament incentive schemes. They find that lying in terms of overclaimed words is most pronounced under the target-based system as targets seem to encourage people to lie particularly if one is close to the target. By following up on their work in the current study we compare lying behavior under the two probably most commonly observed incentive schemes in organizations, i.e., individual piece-rate compensation and team compensation schemes (Gibbons, 1998; Lazear and Gibbs, 2009). We use a variant of the die-rolling game of F&H that resembles an individual piece-rate compensation scheme, i.e., for each unit of her random production output the agent receives one compensation unit. We are able to confirm F&H's findings, i.e., people systematically lie but quite often they are reluctant to do so to the full extent. Our team compensation scheme is modeled as a revenue sharing mechanism (see, for example, Nalbantian and Schotter, 1997), i.e., the random production output of two agents is pooled and each agent receives one half of a compensation unit for each unit of the joint production output. Comparing the incentives to lie under the two schemes reveals that under the team compensation scheme the marginal gain from lying, i.e., the return from exaggerating the own production output by one unit, is only half of the marginal gain from lying under the individual piece-rate scheme. This could lead one to assume that lying should be more pronounced under the individual piece-rate scheme than under the team incentive scheme. On the other hand, lying under the team incentive scheme is not exclusively beneficial for oneself - as it is the case under the individual compensation scheme - but it also benefits the other agent in the team. Thus, an agent under a team incentive scheme might be more able to justify such a *white lie* to herself compared to a lie under the individual scheme - after all she is doing something 'good' for

the other team member. The two lines of reasoning point into different directions whether lying is more severe under an individual than a team incentive scheme. Our data indicates that lying is in fact more pronounced under the team incentives than under the individual piece-rate scheme.

2 Experiment

Our experiment employed a simple one shot decision task closely resembling the baseline treatment of F&H. Due to the short nature of this task we followed their procedure in conducting the experiment after several different other experiments. In all sessions we collected observations for both treatments by randomly assigning participants to treatments. The sessions were run in the laboratories of the University Bonn and the University of Cologne between August 2010 and January 2011 and involved 288 subjects (with a mean age of 24 and 42 % being female). At the end of each experiment we asked subjects to fill in a questionnaire for a statistical survey for which they would be rewarded independently of the preceding experiment.[1] A separate instruction sheet explained that their pay would be based on 'points' p_i that were randomly determined, i.e., by rolling a standard 6-sided die. By introducing points we slightly adapted the framing of the F&H setting. The reason was that we were particulary interested in investigating lying under different compensation schemes. In this paper we refer to the points also as 'random production output'. In both treatments the points p_i of subject i equaled the number d_i shown on the die if $d_i \in \{1, ..., 5\}$. If $d_i = 6$, i.e., a 6 was diced, points p_i were set to 0. Subjects were randomly assigned to the two treatments that differed in the way their points, i.e., random production outputs, were translated into payoffs of π_i. The treatment *Individual* closely resembled the baseline treatment in F&H, i.e., the payoff of agent i was defined as $\pi_i = p_i$. In the treatment *Team* a subject i was randomly and anonymously matched with a different subject j to form a team. Team-member i's individual payoff was calculated according to the following sharing rule: $\pi_i = {}^1\!/_2 \cdot (p_i + p_j)$. Team-member j's payoff was exactly the same, i.e., $\pi_j = \pi_i$. It should be emphasized that we designed the two incentive schemes such that they were comparable with respect to two important characteristics. First, the expected payoff of a subject was 2.5 under both schemes if one assumes that all subjects honestly reported their true numbers. Secondly, if all subjects behaved selfishly and maximally exaggerated their numbers they earned 5 under both incentive schemes.

Subjects were instructed to privately role a die in their cubicles and to jot down the appearing number on a sheet of paper that was handed out to the subjects and collected afterwards.[2] Finally, subjects filled in the questionnaire. At the end of the session participants were privately paid π_i with a conversion rate of 1 €.

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[1]The questionnaire contained questions about gender and personality measured by a 10-item Big Five inventory covering the traits openness, conscientiousness, extraversion, agreeableness and neuroticism (Rammstedt and John, 2007).

[2]To be more precise we asked them to jot down the very first number that appeared on the die. In fact we followed the procedure of F&H and explicitly allowed the subjects to roll the die several times. As F&H we argued that by doing so they could assure themselves of the die being fair.

3 Hypotheses

We are primarily interested in whether agents are more inclined to lie under one of the two incentive schemes. As mentioned earlier two competing hypothesis are at hand. The first one relates to the fact that the marginal gain from lying is higher under the individual piece-rate scheme than under the team incentives. This leads us to our first hypothesis.

Hypothesis 1: *Lying is more often observed under the individual piece-rate incentive scheme than under the team incentive scheme.*

On the other hand, under a team incentive scheme a liar has the excuse that lying comes with doing something good for the other member of the team, i.e., a lie is partly a *white lie*. Such an excuse is not available under the individual piece-rate incentive scheme. This results in our second hypothesis.[3]

Hypothesis 2: *Lying is more often observed under the team incentive scheme than under the individual piece-rate incentive scheme.*

To see which of the two hypotheses can be supported we have to turn to our data.

4 Results

Our main results are summarized in Figure 1 and in Table 1. In the figure we see the distribution of reported production outputs of our two treatments (black bars). Rolling fair dices should generate a uniform distribution of production outputs (dashed line) and an average of actual production output of 2.5.

The left side of the Figure 1 shows the results of our treatment *Individual*. For comparative reasons the grey bars indicate the results of the baseline treatment of F&H. Visual inspection already reveals that the results of our treatment *Individual* are very similar to their results. A comparison to our *team* treatment provides insights regarding our research question.
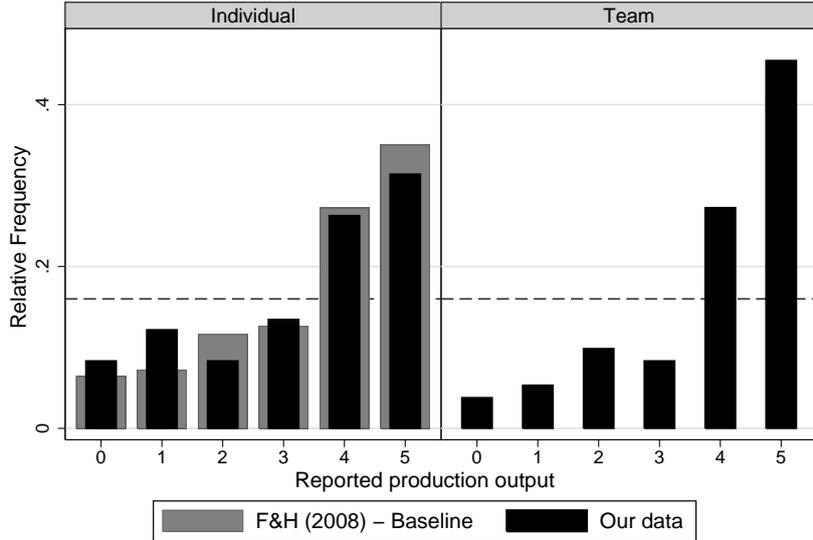
Observation 1: *Reported production outputs are significantly higher in treatment* Team *than in treatment* Individual.

While subjects report on average 3.31 under individual incentives, in the treatment *Team* participants report on average 3.86. A Mann-Whitney-U-test (MWU-test) comparing the distribution of reported production outputs between both treatments reveals that subjects report significantly higher production outputs in the treatment *Team* than in treatment *Individual* ($p=.003$, two-sided).[4] The observation that subjects are more inclined to lie

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[3]An additional reason why agents might be more inclined to lie under a team incentive scheme is that in general it is less obvious who of the two team members actually lied. This might also have played a role in our experiment since the earnings were paid out by one of the experimenters and being paid a high amount makes it more likely that lying is involved.

[4]F&H report an average of 3.52 € in their baseline treatment. The distributions of numbers in F&H's baseline treatment and in *Team* are significantly different (MWU-test: $p=0.02$, two-sided).

Figure 1: Relative frequency of reported production outputs in different treatments.

under the team incentive scheme is also supported, when comparing the frequencies of the maximal possible exaggeration, i.e., a reported production output of 5.

Observation 2: *A production output of 5 is reported more often in treatment* Team *than in Treatment* Individual*.*

This observation is can be backed by a χ^2-test (p=.014, two-sided). A pairwise comparison of all numbers reported is shown in Table 1. In line with the findings of F&H we also observe that lying is 'incomplete' in our two treatments.

Observation 3: *Incomplete lying is observed in both treatments,* Team *and* Individual*.*

Support for this observation is shown in Table 1. The results indicate that in both treatments the frequencies of reported production of 4 significantly exceed the frequency that one would expect from honest subjects. While in both treatments 0, 1 and 2 are reported significantly less often, only the frequency of the production output of 3 under *individual* incentives cannot be distinguished from the relative frequency of $^1/_6$.

Relating gender and personality traits (elicited by the questionnaire) with the production outputs reported by the respective subjects unveils some interesting further insights on potential determinants of lying. In the treatment *Individual* women report significantly lower production outputs (mean women: 2.95, mean men: 3.64, MWU-test, p=.025, two-sided) which is in line with the findings of Dreber and Johannesson (2008). A corresponding gender difference cannot be observed in the treatment *Team* (mean women: 3.58, mean men: 4.02, MWU-test, p=.274, two-sided). When pooling the data of our two treatments we see that women report a production output of zero significantly more often than men (χ^2-test, p=.007, two-sided). Recall, that reporting a zero is a strong indicator of honesty

Treatment	n	Av. p_i	Reported production output p_i (rel. frequencies)					
			0	1	2	3	4	5
F&H	389	3.52	.064 ---	.072 ---	.116 ---	.126 ---	.272 +++	.350 +++
			∨	∧	∧*	∨	∧	∨	∨
Individual	156	3.31	.083 ---	.122 -	.083 ---	.135 $^{n.s.}$	.263 +++	.314 +++
			∧***	∨	∨**	∧	∨	∧	∧**
Team	132	3.86	.039 ---	.053 ---	.098 --	.083 ---	.273 +++	.455 +++

Table 1: Plus and minus signs display the significance of a one-sided binomial test indicating that the observed relative frequency is smaller (larger) than $\frac{1}{6}$ ($^-$($^+$)=10 %-level, $^{--}$($^{++}$)=5%-level, $^{---}$($^{+++}$)=1 %-level, $n.s.$ = not significant). Stars display the significance of a two-sided χ^2-test indicating that there is a significant relationship between the treatment and a dummy for the reported production output (*=10 %-level, **=5%-level,***=1 %-level).

since it results in a payoff of zero. To check for the influence of personality we ran a linear regression explaining the reported production output p_i. We find that extraversion and neuroticism have a significantly positive effect on reported production outputs (extraversion .263, p=.012; neuroticism .257, p=.017).[5] In this regression the coefficient for women turns out to be significantly negative (Women -.709, p=.001).

5 Concluding remarks

We investigate the influence of two widespread compensation schemes on agents inclination to lie. By employing a simple experimental design introduced by Fischbacher and Heusi (2008) we find that lying is prevalent under both schemes but more pronounced under team incentives than individual piece-rates. This finding highlights a so far fairly neglected feature of compensation schemes. It shows that organizations are well advised to be vigilant regarding potentially harming side-effects of compensation schemes. Agents working under team incentives might be particularly prone to lying and deception because a culprit can more easily convince herself to lie by arguing that the intention of lying was actually a good one, i.e., to benefit the other team members. There might also be other reasons, e.g., in general it is easier to hide individual wrongdoing under a team than an individual compensation scheme which makes it more difficult to pinpoint a liar in teams. Further research is needed to unambiguously identify the exact mechanisms behind the observation that lying is more prevalent under team incentives than individual piece-rates.

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[5]The coefficients and p-values are obtained by running an OLS-regression with robust standard errors that controls for treatments, gender and personality traits. In fact we had to leave out the personality trait 'agreeableness' because the internal consistency of the questions intended to measure this facet was not sufficient (Cronbach's alpha for the five facets were: openness .51, conscientiousness .51, extraversion .69, agreeableness .08, neuroticism .58).

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Appendix

Instructions of the Experiment (translated from German)

Statistical Survey

For a statistical survey (independent of the previous experiment) we ask you to answer some brief questions. To determine your payment for answering the upcoming questions, we ask you to roll a die. If you roll a 1, 2, 3, 4, or 5 you receive the diced number as points. If you roll a 6 you receive 0 points. The following applies to you:

{[*Individual*] For answering the questions, the points will be paid to you in Euro.}
{[*Team*] Another participant will be randomly assigned to you. The points of this participant and your points will be added up. For answering the questions, you and the other participant each will be paid half of the sum of these points in Euro.}

Now, please dice your number (the number diced at the first time counts; afterwards you can roll the die several times to check if the die is really fair). Now enter the diced number that you have rolled at the first time: _____
When you are ready, please fold this sheet once and hold it out of the cubicle. When all participants are done the sheets will be collected. Afterwards the questionnaire will be handed out to you. We ask you to carefully answer the questions.

{} = Indicate the phrase that is exclusively employed in the respective treatment, [*Individual*] or [*Team*].