Title:

Where are the liars? Extremely low levels of dishonesty in an experiment where individuals are incentivized to cheat.

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16 **Abstract**

17 Individuals cheat more in groups than when alone, though the exact reasons for this are not
18 clear. Here, we use a lab-based experiment ($N = 116$) to ask whether (i) variation in risk-
19 proneness and (ii) the perception of subjective social costs, such as being perceived
20 negatively by others or the consequences of letting others down, motivate people to behave
21 dishonestly. In addition, we asked whether self-reported social and ethical risk preferences
22 impact dishonesty and whether these interact with social pressure. The most striking result of
23 this study is the very low levels of dishonesty observed: despite using established methods
24 that have demonstrated high levels of dishonesty in previous studies, only seven (6 %)
25 participants were dishonest in this task. It is possible that contextual factors greatly affect
26 dishonesty, though we also discuss the possibility that previous experiments have over-
27 estimated the extent to which people will lie for financial rewards in laboratory experiments.

28 **Key words: honesty, risk, cheating, fairness, ethics**

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30 Introduction

31 From the taxpayer who omits income on their statement to reduce their tax bill, to the
32 employee who falsely reports the number of hours spent on a client's work, dishonesty is a
33 costly behaviour, often resulting in unfair and harmful outcomes. Traditional economic
34 models suggest that economically rational individuals are dishonest if the expected benefits
35 (e.g. financial gain) outweigh the expected costs (e.g. the consequences of being caught) (1).
36 However, recent studies have suggested that individuals do not appear to be economically
37 rational when it comes to dishonesty (2–5). In six experiments investigating dishonesty,
38 Mazar et al. (5) found that when given the opportunity and incentive to be dishonest and not
39 be caught, individuals demonstrated dishonesty by cheating, but did not cheat to the 'optimal'
40 amount that would be predicted by a cost-benefit model. In fact, participants were dishonest
41 in the range of 6.7% to 20% of the possible magnitude that they could have benefited from
42 (5) (see also (2,3,6)). Moreover, higher incentives to be dishonest do not always
43 proportionally increase dishonesty (3,5,7,8).

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45 Some recent work indicates that perception of social costs might play an important role in
46 predicting when individuals will behave honestly or dishonestly. Specifically, whether people
47 interact individually or as part of a group seems to affect levels of dishonesty, with
48 dishonesty generally being higher in groups (3,9–11). These findings have been variously
49 interpreted in terms of (i) reduced sense of personal culpability for group dishonesty (12), or
50 (ii) increased moral permissibility of dishonesty when others – particularly in-group members
51 - will benefit (3,10,13,14) (reviewed in (15,16)). It is also possible that people are more
52 dishonest in group settings to avoid social embarrassment that comes with appearing
53 incompetent. Such a motive could also explain why individuals are more dishonest in groups
54 than when acting individually. Empirical evidence that explicitly tests this latter hypothesis is
55 quite mixed. For instance, Mazar et al. (5) found that the level of cheating was not affected
56 by what participants were told was the average reported performance of others and thus
57 suggested that participants were not dishonest in order not to appear incompetent to others.
58 However, it is not clear whether or not participants were subject to potential social
59 embarrassment by having to show others their score that could be below the average score
60 that they were told. On the other hand, Pascual-Ezama et al. (17) found that the amount of
61 dishonest behaviour that was considered acceptable increased when there was a chance for

social reward such as prestige. The social reward in this case was the chance to be declared a ‘winner’ in front of peers and this prestige and even in a small group, this increased dishonesty in order to win the social reward (17), suggesting that in fact others’ perception of an individual’s ability can be a motive for dishonesty. In this study, we aimed to test whether dishonesty is motivated by (1) a desire to avoid appearing incompetent in front of others versus (2) a desire to provide benefits for the group.

We were also interested in the link between dishonesty and risk taking. Previous research indicates that increasing risk-proneness in the ethical domain predicts increased dishonesty, when individuals act independently (18). It is not known how social risk-proneness affects dishonesty. Our prediction is that people who were more socially risk-averse would be more likely to behave dishonestly in order to avoid social costs. We tested the following hypotheses: (1) dishonesty in general will be positively associated with ethical risk-proneness, (2) the desire to appear competent to others is a motive for dishonesty and this is moderated by social risk-aversion, (3) individuals are more dishonest in groups, as they fear the social costs of letting the team down, and (4) individuals are more dishonest in a group, than when dishonesty benefits them alone.

Method

This study was approved by the UCL Research Ethics Committee (project 3720/001). Everyone participated on a voluntary basis and gave informed consent. The experiment took place during sessions over April, May and June 2016, in the Department of Experimental Psychology at UCL.

Participants

We recruited 120 participants (38 male, 78 female, $M_{age} = 24.931$, $SD = 9.0099$) using the Department of Experimental Psychology online recruitment database (SONA). Four participants did not throw their test sheets in the bin, but took them away with them so data from these individuals were not included in analyses. Of the remaining 116 participants, 78 (67 %) were female and the mean age ($\pm$ sem) was 25 ± 0.8 . Participants were mostly undergraduate ($n = 66$) or postgraduate ($n = 35$) students. Participants were paid a minimum

of £4 for taking part in this study, and had a chance to earn a performance-based bonus. Participants were not informed as to the hypotheses prior to being tested to prevent this knowledge from impacting their behaviour. Instead, participants were told that the experiment was about personal characteristics and decision making under pressure.

Experimental Task

All participants completed two questionnaires and took part in the experimental task. The order in which participants completed the questionnaire and the experiment was counter-balanced, though imperfectly due to the fact that participants were recruited in five batches of 24, with each batch participating in the same room at the same time. Thus, two of the batches (48 people) did questionnaires, then experiment; while the remaining three batches (72 people) did experiment then questionnaires. Participants were required to answer a series of comprehension questions correctly to ensure that they understood the task.

Questionnaire 1 was used to record participant demographics: gender, age, ethnicity and student status. Questionnaire 2 was used to measure participant's ethical and social risk preferences, using the Domain-Specific Risk-Taking (DOSPERT) scale (19). Ethical risk preference measures an individual's preference for partaking in ethically risky activities such as having an affair, whereas social risk preferences measure an individual's preference for partaking in socially risky activities such as moving away from their family. A higher ethical or social risk score indicates a tendency towards higher risk proneness in that domain. Questionnaire 2 consisted of 24 questions, 12 of which were questions from the social and ethical risk domains from the DOSPERT scale, and 12 of which were decoy questions that were not for analysis, but to conceal the purpose of the experiment. We expected that ethical risk-proneness would negatively correlate with dishonesty for personal gain (i.e. a replication of (18)). We expected that social risk-proneness would affect how willing people were to cheat in order to help group members (see below) though we were agnostic about the direction of the effect. All experimental materials are available online at <https://osf.io/zkpbt/>.

We used a modified version of the matrices task (3) to measure dishonesty. Each participant received a test sheet consisting of 20 matrices to solve within two minutes. Each matrix contained a set of 12 three-digit numbers, two of which added up to 10 (Figure 1). Participants were informed that they would receive £0.50 for each correctly solved matrix. Before starting, participants were shown an example matrix with the correct solution, which was on the back of a ‘collection slip’ on each of the participants’ desks. After the two-minute test period, participants were instructed to open a second envelope containing the correct answers to the test, and to mark their own tests. Participants were then instructed to write the number of matrices they solved correctly on the collection slip, already on their desks. They were then instructed to put their answer sheets with the matrices in the recycling bin at the back of the room. To obtain accurate measures of dishonesty, we used the same method as Gino et al. (3). All participants received the same matrices to solve, except for one three-digit number in the last matrix on the test sheet, which was unique to each participant in the group. This number matched the bottom right three-digit number in the matrix used as an example on the back of that participant’s collection slip and thus served as a unique identifier, allowing the difference between actual and reported performance to be calculated for each participant, whilst remaining ostensibly anonymous.

We used a 2 x 2 between-subject design. All participants completed the task anonymously and individually but were pre-assigned to a group of three individuals. Each testing session comprised two of these groups. Participants were randomly allocated to one of four treatments, which varied according to whether payoffs for correctly solved matrices affected just the individual or also the group (see below), and whether the participant’s score would be announced publicly to the group, or kept private. Participants were instructed to complete their tests in silence without conferring with their group members. All conditions took place in the same room with the same layout. Desks were set up apart from each other so participants could not copy each other’s work.

In the *private* condition, participants completed and marked the task individually and then brought their collection slip to the experimenter who sat at the front. Thus, only the participant and the experimenter saw the score. In the *public* conditions, participants came to

the front in groups of three and placed their score sheet on the experimenter's table. Thus, in the *public* condition, each participant's score was also revealed to the two other group members. For *individual payoffs*, participants' earnings only depended on the number of matrices they correctly solved. For *group payoffs*, the scores of the three group members were averaged to generate a 'team score' on which each group member's payment was based.

6.46	8.37	9.39
0.92	2.14	4.23
4.67	2.39	0.61
2.50	4.64	5.74

Figure 1: Example of a matrix to be solved in the test, with solution highlighted in bold.

Follow-up survey

After approximately 2-3 weeks, we also conducted a follow up survey (sent via email) to explore the reasons for honesty or dishonesty in this task. Participants were asked what they thought the purpose of the experiment was before being informed. Participants were then asked whether they had cheated, and selected from a list of reasons that affected their decision to be honest or dishonest. Multiple choice rather than open text was used in order to assess some particular reasons we thought may be responsible for honesty.

Results

The mean score for the ethical risk-proneness was 2.28 ± 0.07 , compared with 4.08 ± 0.08 for social risk-proneness (paired t-test, $t = -19.9$, $df = 115$, $p < 0.001$, Figure 2). On average, participants correctly solved 2.92 ± 0.2 matrices. Despite this relatively low score, the most striking result from this study were the extraordinarily low levels of dishonesty: only 7 of the 116 (6.03 %) participants were dishonest. There was at least one dishonest participant in each of the 4 conditions. Of the dishonest participants, six were female. Due to the small numbers

of dishonest participants, and the dishonesty of participants being spread relatively evenly throughout conditions, it is difficult to conduct informative statistical analysis on the factors affecting variation in dishonesty.

Figure 2. Boxplot showing distribution of mean scores from the ethical and social subscales of the DOSPERT risk preference questionnaire (19). Raw data displayed as open circles, with a horizontal jitter function of 0.1 applied to ease visualisation. Plot produced using R package *ggplot2* (20).

Follow up survey: 60 participants responded to the follow up survey from across all four conditions. Only two of these reported being a dishonest participant. Four of these respondents thought the experiment was about dishonesty, but others thought it was about something completely different such as problem-solving skills and personal characteristics. Participants were asked to identify the most important reasons and other reasons for being honest or dishonest. The most commonly cited most important reason for a participant's honesty was that the participant felt that it would be immoral to cheat (25/60). Other common reasons cited as reasons for a participant's honesty was that the participant would have felt guilty (31/60), that they believed that the researcher would find out their actual score (23/60), and that they did not realise it was about dishonesty and did not want to adversely affect the results of the experiment for the researcher (23/60). For full results of the survey, see supplementary materials.

Discussion

We asked whether dishonesty would be higher in groups, either because individuals avoided appearing incompetent in front of peers or wanted to avoid 'letting the side down'. We also investigated how dishonesty in individual and group settings was moderated by self-reported risk preferences. The most striking result from this study is the extremely low levels of dishonesty observed: despite using similar methods to previously published studies, only 7 / 116 participants dishonestly reported their scores. Consequently, the questions of whether individuals are dishonest to signal competence to others, or to avoid perceived costs associated with 'letting the team down' cannot be answered from this data. Nevertheless, our data do not support the hypothesis that people are more dishonest when they are in groups than when they act individually. We also do not support the previous finding (18) that ethical risk-taking score on the DOSPERT predicts dishonesty. Some reasons for these failed replications are discussed, as well as implications for the field more generally.

Previous work investigating dishonestly using Western student populations in similar paradigms with similar sample sizes have reported far higher levels of dishonesty than we found here (e.g. (10,21,22)). For example, in the Gino et al. (3) paradigm that we use, the

original study found that 56 % participants cheated in the group payoff condition, and 23-28 % cheated when only their own payoffs were at stake. Other work has shown that students are more dishonest than nationally representative samples (23), which would imply that we should have observed higher levels of dishonesty in this task.

Nevertheless, other studies paint a different picture: implying that most people are in fact honest (24–27) even when very large financial sums are at stake (28). It is possible that honesty is contextually sensitive. For example, Gächter & Schultz (29) used a large-scale cross-cultural design to show that prevalence of dishonesty varies across countries and is linked to societal variables that measure the prevalence of rule violations. Other work has shown that honesty is also sensitive to context: for example, people are less likely to lie when it concerns their performance in a task than when the outcome of the task was determined by luck (30). One limitation of the current study is that the financial gains at stake to incentivise dishonesty were relatively low. However, we note that previous work has established that dishonesty seems largely insensitive to stake size (8), though the effect of stake size on honesty might actually vary across different participant types (31). Nevertheless, given that the stakes used in this study were in line with those used in other tasks where much higher levels of dishonesty were reported (e.g. in (8) participants were awarded \$0.50 for every correct answer), we conclude that stake size is unlikely to be the sole reason why we observe such low levels of dishonesty. Finally, we note that our sample was quite female-biased and that females apparently tell fewer self-serving lies than males (32) (but see (24)). Despite this, six of the seven dishonest participants in our study were in fact female.

There are also some differences in the methodology between our study and the studies we attempted to replicate and extend. In our study, participants were given less time to answer the matrices (2 minutes compared to 5 minutes in Gino et al. (3)) meaning that average actual scores were likely to be lower. This may have disincentivised participants from cheating because for every point dishonestly added to a score, the proportional increase in the final score is greater when the starting score is lower compared to higher. While this is possible, we note that cheating has been shown to occur more amongst students with low achievement

than high achievement (33)), suggesting that lower average scores might actually be expected to encourage, rather than discourage dishonesty.

As participants put their answer sheets into a recycling bin instead of taking it with them or shredding it, some participants may have thought there was still a chance they would be caught cheating if they were dishonest. More than a third of follow-up survey respondents stated that the potential of being caught cheating by the experimenter was one of the reasons for their honesty. This suggests that although participants are asked to throw their answer sheets in the bin and are told that their answers are anonymous, there is still a perception that dishonesty will be discovered. This may also be the reason for a difference in dishonesty in two experiments ran by Gino et al. (3): dishonesty was higher in the experiment where answer sheets were shredded (implying more certainty that dishonesty would be undetected), than in the experiment where sheets were placed in the recycling bin. More generally, this concern for being found out speaks to a more specific limitation of laboratory experiments that investigate social behaviour under conditions of supposed anonymity: in real life, there are no settings where people know with certainty that they are anonymous and so subjects may often behave as if their actions might be observed by others (discussed in (34)). In the follow-up survey, by far the most popular reason participants gave for not cheating was that they thought it immoral. In fact, only 38% of honest participants who responded to the survey even considered over reporting their score, which suggests how deeply embedded moral values may be.

To conclude, this study reports very low levels of dishonesty in a lab experiment using standard methods that have previously revealed much higher levels of dishonesty. It is possible that this variation is due to contextual differences between our study and previously-reported results; however, it is also possible that most people are honest most of the time and that previous laboratory studies may have over-estimated the willingness of people to cheat for relatively small gains.

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275 **End Statements**

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277 **1. Data availability**

278 All data and code to reproduce analyses are available at <https://osf.io/zkpbtd/>.

279

280 **2. Competing Interests**

281 The authors declare no competing interests.

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283 **3. Author Contributions**

284 Both authors developed the study concept. All authors contributed to the study design.

285 Testing and data collection were performed by CL. CL and NR drafted the manuscript. All

286 authors approved the final version of the manuscript for submission.

287

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291 **4. Research Ethics**

292 This project was approved by the UCL Research Ethics Committee under project 3720/001.

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294 **5. Animal Ethics** - not applicable

295 **6. Permission to carry out fieldwork** – not applicable

296 **7. Acknowledgements:** Not applicable.

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