Cheating and gender - PNAS template

Raymond M. Duch[a] **and Denise Laroze**[b,1]

[a]Nuffield College, University of Oxford, New Road, Oxford, OX1 1NF, United Kingdom; [b]Centre for Experimental Social Sciences, Universidad de Santiago de Chile, Concha y Toro 32C, Santiago, 8340599, Chile, orcid.org/0000-0002-6138-2570

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Do men cheat more than women? In terms of relationships, folk wisdom would have us believe men are, at least, caught more often. However, given ethical concerns, it is unlikely that one will ever have the answer. We use a modified version of the Public Goods game, with a real effort task and the possibility of cheating when asked to declare taxed earnings, to identify individual levels of cheating, and a die experiment. Our experimental results suggest that,once we control for the level of ability, women cheat just as much as women. Gender differences are tested on a comprehensive set of experimental treatments that vary the nature of the earnings, different cultural settings, and lab and online subject pools.

Cheating | Experiments | Gender

Introduction, relevance and literature

TESTING IF THIS SYNCS WITH OVERLEAF

Literature: (1) find significant differences in gender using the Greezy (2005) (2) trust game with incentives to lie. Men are more likely to cheat than women.

This paper contributes to the experimental research on gender and cheating in XXX novel aspects of the design.

1. Includes individual level data. With a few exceptions (1), most papers that look at gender and cheating use the die experiment(3) to evaluate population level variation across female and male subjects (CITE).

2. The experimental design includes two different measures of cheating. In the first incentives to cheat are liked directly the results of a real effort task (RET experiment) where each individual has to earn there income. The second is a die experiment, where payments depend on random luck and/or a willingness to cheat.

3. the design includes measures for variables that can alter a persons willingness to cheat, including pro-social preferences through a Dictator Game and a classic incentivized risk aversion test(4)

4. The experiment was conducted in three different countries (UK, Russia and Chile) and using two types of experimental modes (online and lab).

1. Experimental Design

The experiment followed (5) and had the following parts: 1) A dictator game, followed by 2) two modules of real effort task, 3) a risk aversion test, and 4) a questionnaire that was preceded by a die game in some sessions. Subjects received printed instructions at the beginning of each module, and instructions were read and explained aloud. Subjects received feedback about earnings and payment at the end of the experiment.

Selfish Preferences: In the beginning of the experiment, we measured the general other-regarding preferences of subjects with a standard Dictator Game (6). Subjects were asked to allocate an endowment of 1000 ECUs between them and another randomly selected subject in the room. Participants were informed that only half of them will receive the endowment, and the ones who receive the endowment will be randomly paired with those who don't.

Real effort task: Following the dictator game, we conducted a real effort public goods experiment to measure cheating behavior.

This part of the experiment consisted of 20 rounds. Each round began with a real-effort task. A subject had to add two two-digit numbers and record the answer, after which he was given another pair of numbers to add, and so on until one minute expired. A running tally of correct answers was visible on the computer screen. After one minute, the subject was informed about his Preliminary Gains, which were equal to the number of correct additions times a predetermined number of ECUs. After that, subjects were asked to declare their gains. A certain percentage of these Declared Gains was then deducted from their Preliminary Gains; these deductions were then divided evenly among the members of the group. This deduction or tax rate did not vary with the round and was known in advance. Treatments with 10%, 20%, and 30% tax rates were used.*

At the beginning of each 10-round module, subjects were informed that there is a probability that Preliminary and Declared gains can be compared and that, if there is a difference,

*One experimental session in UK had a 40% tax rate was used.

Significance Statement

Cheating is an important aspect of human interaction, people cheat on their taxes, or take App based driving services that don't comply with all government regulations (e.g. UBER), others take a bagel without paying for it. Correctly identifying the types of people that are more likely to cheat can help our predominantly intuitive System 1 (7) make beneficial decisions quickly. Some observable cues, such as a gang tattoo on a person's face, may well be good predictors of cheating, however, we argue that gender is not. Using an extensive list of experimental treatments in three countries, we find that there is little difference across genders and that this varies across countries. Not only are men and women equally likely to cheat, they also respond equivalently to the same intervening factors (pro-social preferences, aversion to risk).

R.D. Designed the research; D.L. analyzed the data; R.D. and D.L. wrote the paper

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[1]Correspondence should be addressed to Denise Laroze. E-mail: denise.larozecess.cl

they will be fined 50% of the difference between Preliminary and Declared earnings.[†] Subjects were informed of the exact probability at the beginning of each module. In the first module, this probability invariably was 0%; only the data from this module is used in the study. In the second module, the probability varied between 10 and 100%, depending on the session; we do not use this data in our analysis, as we focus on cheating decisions made when there were no risks of penalties.

Treatments: Besides varying the tax rate, we implemented several different treatments in the RET part of the experiment, designed to identify conditions under which subjects might vary their degree of cheating. In the "Baseline" treatment the earnings of the subjects were strictly tied to their performance, and all subjects received the same payment of 150 ECU per correct answer to the real effort task.

In the "Status" treatment, subjects did not receive equal salary. In every four-member group, two subjects received 100 ECU per correct answer, and the other two subjects received 200 ECU. The roles were assigned at random at the beginning of each 10-round module, and remained unchanged throughout the 10 rounds.

In the "Shock" treatment, subjects received either 150 ECU (in Chile) or 100 ECU (in Russia and in UK) per correct answer. In every round, each subject had a 50% chance of receiving a bonus payment of 1300 ECU. Subjects were informed about their bonus after they completed the RET task, but before they reported their income. Subjects were presented with a breakdown of their earnings (gains associated with their performance in the RET and the portion associated with the bonus).

Finally, in the "Baseline Non-fixed" treatment, the subjects were randomly reassigned to new groups at the end of each round. The breakdown of experimental sessions by treatment and tax rate is shown in Table **??**. **Subjective Ability:** In "Baseline Non-fixed" treatment we also elicited incentivized subjective assessments of RET ability. After completing the practice round for the RET, but before the first round of each 10-round RET module, subjects were asked to rank, on the 1-4 scale, their RET performance in the following round relative to other players in their groups (with 1 indicating that the subject was expecting to rank first). They were informed that they would earn extra 150 ECUs if their prediction was correct. In two randomly selected rounds (excluding the first round), subjects were similarly asked to rank their RET performance immediately completing the RET task.

Risk Aversion: Subjects made incentivized decisions in a standard risk aversion test (4). Participants had to choose between a high risk option A and a low risk option B in 10 different pairs of lotteries. One of these decisions was selected at random for payment.

Questionnaire and die tossing game: At the end of the experiment, participants were asked to answer a short attitudinal and demographic questionnaire. In some sessions[‡] a version of the (3) die tossing game was implemented prior to the questions. Subjects were asked to toss a die and report the result, without any means for the experimenter to observe the outcome. The participants were told that, after reporting the result, they could toss the die as many times as they wanted as a means to test if the die was fair. The payoff for this part of the experiment was equal to 100 ECU times the number reported.

[†] Each module was also preceded by one a practice round, when subjects completed the real effort task, but did not declare gains.

[‡] The complete list of sessions is found in Table ?? in the Appendix.

Table 1. Comparison of the fitted potential energy surfaces and ab initio benchmark electronic energy calculations

Species	CBS	CV	G3
1. Acetaldehyde	0.0	0.0	0.0
2. Vinyl alcohol	9.1	9.6	13.5
3. Hydroxyethylidene	50.8	51.2	54.0

nomenclature for the TSs refers to the numbered species in the table.

2. Results

3. Discussion

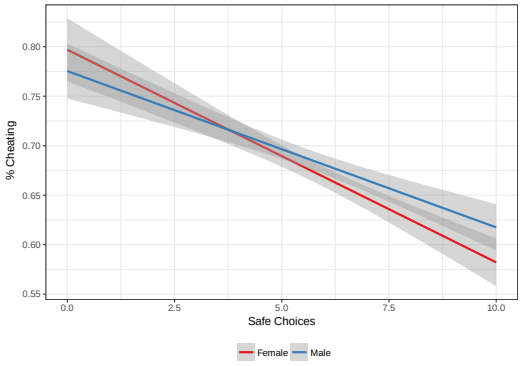

Fig. 1. Gender by ability and audit rate

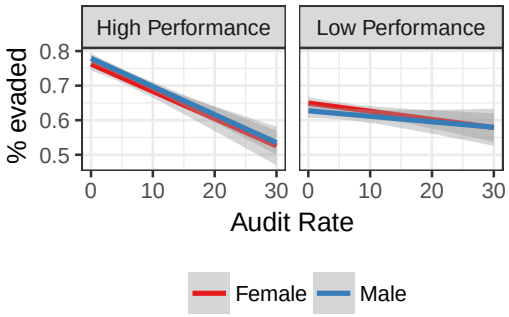

Fig. 2. Cheating by ability type

Digital Figures. Figure 1 shows an example of how to insert a column-wide figure. To insert a figure wider than one column, please use the `\begin{figure*}...\end{figure*}` environment. Figures wider than one column should be sized to 11.4 cm or 17.8 cm wide. Use `\begin{SCfigure*}...\end{SCfigure*}` for a wide figure with side captions.

Materials and Methods

The majority of participants were recruited from the University of Oxford in Oxford, the Universidad de Santiago (USACH) in

Santiago and the Higher School of Economics (HSE) in Moscow. Oxford and HSE are elite universities, with a large proportion of students from families of high socio-economic status. Students at USACH, on the other hand, are very diverse with many from middle to low socio-economic backgrounds and first family members to attend university. Slightly over half of all subjects were males (51.5% in UK, 52.2% in Chile, and 52% in Russia). The majority of subjects were in their late teens and 20s, with the median age being 22 years in UK and Chile, and 20 years in Russia.

Subjects were paid the amount they kept/received in the Dictator Game, plus a randomly selected round from the first RET and decision module, plus one randomly selected round from the second RET and decision module, plus the results of the Risk Aversion Test and the Die treatment, when applied. ECU earnings were converted at the exchange rate of 300 ECUs per £1 in Oxford and 300 ECUs per 500 pesos in Santiago. The exchange rate in Moscow varied between 7 ECU and 9 ECU per Russian rouble to keep the total earnings relatively constant in USD dollars.[§]

All the data presented in this manuscript will be made available though the PNAS repository and Github.

ACKNOWLEDGMENTS. Please include your acknowledgments here, set in a single paragraph. Please do not include any acknowledgments in the Supporting Information, or anywhere else in the manuscript.

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[§] The exchange rate for Rouble was between 35 and 60 Roubles per USD, depending on when the session took place.