Journal of Economic Behavior & Organization 93 (2013) 293–300

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

# Measuring lying aversion

Uri Gneezy[a], Bettina Rockenbach[b], Marta Serra-Garcia[c,*]

[a] Rady School of Management, University of California, San Diego and CREED, University of Amsterdam, The Netherlands
[b] Department of Economics, University of Cologne, Germany
[c] Department of Economics, University of Munich, Germany

ARTICLE INFO

*Article history:*
Received 1 March 2013
Accepted 8 March 2013
Available online 26 March 2013

*Keywords:*
Deception
Lying
Lying aversion
Experiment

*JEL classification:*
D03
D83
C92

ABSTRACT

We introduce a new method for measuring the decision to lie in experiments. In the game, the decision to lie increases own payment independent of the counterpart's decision, but potentially at a cost for the counterpart. We identify at the individual level the decision to lie, and measure how individuals react to different incentives to lie. Furthermore we investigate how lying behavior changes over time. Our method allows us to classify people into types, including those who never lie, those who always lie, and those who react to incentives to lie. We suggest this method as a useful instrument for examining factors that influence the decision to lie.



## 1. Introduction

Accumulating evidence suggests people are averse to lying in economic interactions. This evidence is in contrast with the classic approach in economics, which assumes people are selfish and that lying in itself does not carry any cost (Crawford and Sobel, 1982).

Evidence in support of the positive costs of lying comes primarily from experiments that can measure behavior in controlled settings. The ability to measure lying costs and to compare the effect of manipulating the environment on these costs is important to our understanding of the factors that influence the decision to lie. Two main experimental procedures were developed in the last decade. Each method has its pros and cons. In this paper, we propose a third approach, which eliminates some of the problems with the existing methods.

The first method uses a two-player deception game in which a sender has private information and the receiver takes an action (Gneezy, 2005). The sender sends a message to the receiver, and payoffs to both players depend on the action chosen, not on the message. Gneezy (2005) showed incentives impact the decision to lie: when the sender earns more money from lying, she is more likely to lie. Moreover, increasing the receiver's loss from a lie reduces the probability that a sender will lie. Studies have adopted the game to show, for example, men are more likely to tell a lie that helps them but hurts the other (Dreber and Johannesson, 2008), and the cost of lying for some is high enough that they are unwilling to lie even when doing

* Corresponding author at: Department of Economics, University of Munich, Geschwister-Scholl-Platz 1, 80539 Munich, Germany. Tel.: +49 89 2180 9738.
*E-mail address:* marta.serragarcia@lmu.de (M. Serra-Garcia).

0167-2681/$ – see front matter 
http://dx.doi.org/10.1016/j.jebo.2013.03.025

so would have helped both players (Erat and Gneezy, 2012).[i] A problem with this procedure is the decision to lie depends on the sender's beliefs regarding whether the receiver will follow her message. Some senders may choose to tell the truth because they expect the receiver not to follow the message (Sutter, 2009).

The second method for measuring lying behavior uses a non-strategic procedure to avoid the strategic considerations associated with measuring lies. In this method, a participant takes an action for which only she knows the outcome, and then reports it to the experimenter. The reported outcome, which the experimenter cannot verify, determines the participant's payoff. This method also allows the participant to lie without the experimenter's knowledge.

In Fischbacher and Heusi (2008), participants are asked to roll a six-sided die in private and then report the resulting outcome. The participants are paid an amount equal to the number they report, unless the number is six, in which case they are paid zero. Although the experimenter cannot verify the outcome of the die roll, the distribution of the reported numbers can reveal the extent of lying in the population in the way that distribution differs from the expected distribution of outcomes from a fair die roll (see also, e.g., Greene and Paxton, 2009; Fosgaard et al., 2013; Jiang, 2013; Ploner and Regner, 2013, and Shalvi and Leiser, 2013).

The authors found some participants were honest (reported zero profits) and that significantly more than one sixth reported either a four or five. In a similar setup, Mazar et al. (2008) designed an experiment in which participants were asked to answer a test with 20 math tasks, and were paid according to the number of correct answers. To establish the benchmark, in the first treatment, the experimenter checked participants' answers. In another treatment, the participants checked their tests themselves and then shredded them, preventing the experimenter from verifying the reported number of correct answers. Mazar et al. (2008) find participants on average reported about 10% more questions solved when they could cheat (see also, e.g., Pascual-Ezama et al., in press).

This method has two notable drawbacks. First, as described above, the inference made is not based on results from individual participants but on statistical distributions, because the experimenter does not know whether a given participant lied. A recent paper by Gibson et al. (2013) avoids this drawback by informing participants, in the role of CEOs, about the true value of their firm's earnings and asking them to report the earnings of their company to a passive market. Gino et al. (in press) also avoid this drawback by asking participants to throw away their tests in a recycle bin, from which they recovered them afterwards. However, the latter papers and the papers mentioned above face a second drawback. The "victim" of the lie is not another participant, but rather the experimenter. The identity of the victim might affect decision making.

In this paper, we propose a new method that attempts to overcome the problems of the two methods described. The sender's payoff does not depend on the receiver's decision but only on her message, and yet has consequences for the receiver. We observe lying on an individual basis, which is crucial for obtaining individual-level results. Observing individual decisions however comes with a cost. The participants cannot disguise their behavior from the experimenter; this may evoke behavior more compliant to social norms.

## 2. Experimental design

### 2.1. The decision task

Consider a pair of two participants $A$ and $B$. A randomly determined integer number $1 \leq s \leq 6$, the *state*, is assigned to the pair. Each number is equally likely. Participant $A$ is informed about the number assigned, and sends a message about this number to Participant $B$. Her message must be one of the following: "The assigned number is $r$" with $r \in \{1, 2, 3, 4, 5, 6\}$. Participant $B$ receives this message and decides whether to follow it.

$A$'s payoff increases linearly with the number *reported* in the message and neither depends on the state nor on $B$'s decision. More precisely, her payoff is

$$\pi_A = 10 + 2 \cdot r$$

$B$'s payoff depends on whether he follows $A$'s message, and if he does follow it, whether the reported number corresponds to the state:

$$\pi_B = \begin{cases} 10 & \text{if } B \text{ follows and } r = s \\ 0 & \text{if } B \text{ follows and } r \neq s \\ 3 & \text{if } B \text{ does not follow.} \end{cases}$$

If $A$ only cares about her own monetary payoff, she will always report $r = 6$, independent of $s$. Reporting 6 yields a payoff of 22, whereas being truthful yields $10 + 2$ Hence the lower $s$ is, the higher $A$'s monetary gain from lying. Note the behavior of participant $A$ is our main interest in this paper because it represents the decision to lie.

[i] Cappelen et al. (2013) study the non-economic dimensions of the decision to lie, Erat (2013) examines the decision to delegate deception, and Angelova and Regner (2013), Danilov et al. (2013) and Ismayilov and Potters (2013) use this setup to study lying within the context of financial advice.