

TECH3 Module 2 Case: Moral cost of lying

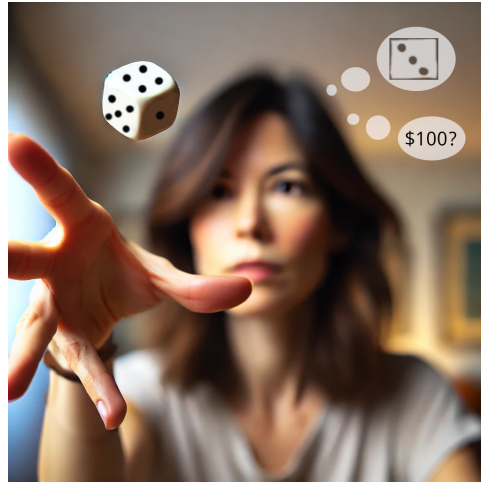


Figure 1: Illustration generated using OpenAI and edited by Sondre Hølleland.

Ekstrøm et.al(2025)¹ performed an experiment in collaboration with NORSTAT where they investigated the moral cost of lying with evidence from Norway and the United States. We focus on the Norwegian case. The experiment has two groups, a control- and a treatment group. All respondents were asked to guess the outcome of a dice roll, then roll a (digital) dice and report the outcome and whether they guessed the outcome correctly. If they guessed correctly, they may receive 100 USD, if not, nothing happens. The treatment group was also given a statement “We trust you” to nudge them to not lie about the dice roll, and an opportunity to make a promise, confirming that they will report honest and correct information in the study by ticking a box for “yes” or “no”. All respondents in the treatment group ticked the “yes” box.

The data consist of the following columns

- **id**: identifier for respondent.
- **date**: date of the experiment
- **treatment**: What treatment did the respondent get? “Trust_promise” or “Control”.
- **reported_diceroll**: Outcome of the dice roll (1-6).
- **correct_guess**: Respondent guessed correct (1) or not (0)?
- **age**: The integer age of respondent.
- **female**: Respondent is female (1) or male (0).
- **education**: What level of education the respondent has, on a scale from 1 to 6 (1=Less than High school; 2=High school degree; 3=Bachelor degree; 4=Master degree; 5=Doctor degree; 6=Prefer not to respond).
- **universitydegree**: Respondent has a university degree (1) or not (0).
- **sector**: Which sector the respondent is hired in (1: Private, 2: Public, 3: Unemployed).
- **employed**: Respondent is employed (1) or not (0).
- **highincome**: Respondent has higher income than the median in the sample (1) or lower (0).
- **politicalright**: Respondent votes right on a scale from 1 to 11 (1 = left and 11 = right).

¹Ekstrøm, M., Bjorvatn, K., Mota, P. S., & Sjøstad, H. (2025). Making a promise increases the moral cost of lying: Evidence from Norway and the United States. *Journal of Economic Behavior & Organization*, 233, 106995.

- **believeingod**: Respondent's beliefs in god on a scale from 1 to 11..
- **believeinfreewill**: Respondent's beliefs in free will on a scale from 1 to 11.
- **generaltrust**: General trust of respondent on a scale from 1 to 11.

You may use the following code to load the data:

```
import pandas as pd
url = ("https://raw.githubusercontent.com/holleland/TECH3/"
      "refs/heads/main/data/ekstrom2025.csv")
data = pd.read_csv(url, sep = ";")
```

In the first couple of problems, we focus on the setup of the experiment. You do not need to look at the data for answers. We assume that the respondents are independent of each other and randomly select a respondent.

Problem 1 Let X be the number of dots on the dice in the experiment of our respondent. What are the possible values of X and what is the probability distribution function of X ?

Problem 2 Let B denote the number the respondent thinks the dice will show prior to rolling the dice. Can we assume that B has the same distribution as X ? Discuss with group.

Problem 3 Let A denote the event that the respondent guess the correct outcome of the dice. Find $P(A)$ using that

$$P(A) = P(X = B) = \sum_{b \in \text{possible values of } X} P(X = b | B = b) P(B = b).$$

Note that you do not need to assume anything about the distribution of B to find $P(A)$.

We now turn to the data for answers.

Problem 4 The respondents have no incentive to lie about the outcome of the dice (just their own guess). Find the relative frequency of the various reported outcomes of the dice and make a visualization of the distribution. Is it consistent with your group's answer in Problem 1?

Problem 5 The variable **correct_guess** is 1 if the respondent guessed correctly and 0 otherwise. Estimate the probability of guessing correctly in the sample. How does the estimated probability relate to what you found in Problem 3 and what does it tell you? Discuss with the group.

Problem 6 Discuss the following statements in the group. You are only meant to do descriptive statistics on these statements. Later on in the course (module 4) we learn how to set up formal hypothesis testing.

- It is reasonable that we treat each respondent as independent of the others.
- Due to the experimental design, we know from the data whether or not an individual lies.
- Due to the experimental design, we know from the data that groups of people lie.
- If nobody lies, the expected number of people in the experiment that guess correct is 133.
- In the data, there are 297 respondent's that guessed correct.
- The dice roll and whether the respondent guess correct are independent events.
- It is surprising that not everyone lies to get the chance to win the money.
- People are more likely to be honest if they are told that "we trust you" and allowed to claim they can be trusted.
- People with higher income are more honest.
- Since most religions tells their followers to not lie, the stronger you believe in God the more honest you are.
- Public sector employees are more honest than in the private sector.

Problem 7 It might seem like this experiment is very far from anything happening in "real life". Can you think of "real life" situations where the knowledge from the experiment may apply?