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Hiromasa TAKAHASHI
Junyi SHEN

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Research Institute for Economics and Business Administration
Kobe University
2-1 Rokkodai, Nada, Kobe 657-8501 JAPAN

The effect of anchoring on dishonest behavior

Hiromasa Takahashi[a], Junyi Shen[b,c]

[a] *Faculty of International Studies, Hiroshima City University, 3-4-1 Ozuka-Higashi, Asa-Minami, Hiroshima 731-3194, Japan*
[b] *Research Institute for Economics and Business Administration, Kobe University, 2-1 Rokkodai, Kobe, Hyogo 657-8501, Japan*
[c] *School of Economics, Shanghai University, 99 Shangda Road, Baoshan, Shanghai 200444, China*

Abstract

This study conducts experiments on dishonest behavior after anchoring the participants' expected reward to investigate the effect of anchoring on dishonest behavior. The experimental results show that those who are anchored to high reward behave less honestly than those anchored to low reward. This is because the anchoring changes participants' expected reward. Such a change in expected reward serve as participants' reference point to affect the likelihood of facing a loss frame where dishonest behaviors are more likely to occur.

Keywords: anchoring effect, reference point, dishonest behavior, expected reward, cheating, risk attitude
JEL classification: D40, D91, G41

1. Introduction

According to the Simple Model of Rational Crime (Becker, 1974), the decision of dishonesty depends on three basic elements: (1) benefit from dishonesty, (2) risk of getting caught, and (3) punishment after getting caught. People conduct cost-benefit analysis considering these elements and decide whether or to what extent to behave dishonestly based on such analysis.

However, Mazar et al. (2008) found that these basic elements do not significantly affect the decision of dishonesty. They suggest a theory of self-concept maintenance; people prefer to believe themselves that they are honest and also want benefit from dishonest behavior, therefore they behave dishonestly to the extent that they can maintain a balance between the benefit and self-concept of being honest (see also Shalvi et al., 2011; Shu et al., 2011; and Jiang, 2013).

Furthermore, Mazar et al. (2008) found that thinking of Ten Commandments or signing to honor code increase attention to moral standards (moral saliency) and decrease dishonesty (see also Gino et al., 2009). On the contrary, it is reported that doing good (e.g., buying eco products) enhances self-confidence in one's moral and make one's own dishonesty easier to tolerate (moral-license, Mazar and Zhong, 2010).

Others studied the various factors that affect dishonest behavior, for example, whether being treated fairly or unfairly (Houser et al., 2012), lightness of a room (Zhong et al., 2010), length of time from dishonest behavior to payment (Ruffle and Tobol, 2014), etc.

In this study, we investigate the effect of anchoring of expected reward on dishonest behavior. Anchoring means the effect that, when people estimate some number, the estimated number is close to the non-related number they saw just before the estimation (Tversky and Kahneman, 1974). It can be observed in the real word and many studies confirmed its existence (Kahneman, 2011).

In our experiment, we anchor the participants' expected reward for some tasks and create the circumstance where participants can cheat and augment reward dishonestly. We test the following hypothesis using the experiment:

Hypothesis 1: Those who are anchored to high reward behave less honestly than those who are anchored to low reward.

The basis for the hypothesis is as follows: High anchored participants expect higher reward than low anchored participants do. The expected reward would serve as a reference point for reward. It is pointed out that dishonesty increases when a reference

point for reward is high (Greenberg, 1990, 1993; Schweitzer et al., 2004; Childs, 2012; Gino and Pierce, 2009a; Gino and Pierce, 2009b). If we consider the expected reward as the reference point, high (low) anchored participants who expect high (low) reward have high (low) reference point for reward. If the performance of a task is not affected by anchoring condition, the possibility that a reference point of a high anchored participant is above one's fair reward, which is calculated correctly is higher than the possibility that a reference point of a low anchored participant is above one's fair reward. That is, the possibility that those who are anchored to high reward face loss frame is higher than the possibility that those who are anchored to low reward face loss frame. Hence, those who are anchored to high reward behave less honestly than those who are anchored to low reward, since those who face loss frame would behave more dishonestly because of loss aversion than those who do not face loss frame (Childs, 2012). Therefore, we also test the following hypotheses:

Hypothesis 2: Those who are anchored to high reward expect a higher reward than those who are anchored to low reward.

Hypothesis 3: The possibility that the expected reward of high anchored participants is above their fair reward is higher than the possibility that the expected reward of low anchored participants is above their fair reward.

Hypothesis 4: Those who expect higher reward than their fair reward behave less honestly than those who do not.

The remainder of the paper is organized as follows. Section 2 describes the details of the experiments. Section 3 presents the results of the experiments. Finally, Section 4 discusses the results and suggests some possible directions for future studies.

2. Experiment

2.1. Experimental design

The experiment in this study based on prior questionnaire following the same task as that in Mazar et al. (2008), in which participants had to find two numbers that added up to 10 from 12 three-digit numbers. There were four treatments according to the contents of the prior questionnaire: no anchoring, anchoring 100, anchoring 2000, and anchoring

8000 treatments.

The prior questionnaire of the anchoring 100 treatment consisted of the following three questions: (1) “Do you expect to earn 100 JPY or more in the experiment?” Participants must answer this question with “yes” or “no.” (2) “How much money do you expect to earn in the experiment?” (3) “How will you spend the money if you earn in this experiment?” In the anchoring 2000 and anchoring 8000 treatments, only the amount of money of the first question is different from the anchoring 100 treatment, which are 2,000 JPY and 8,000 JPY, respectively. The prior questionnaire of the no anchoring treatment consisted of two questions. The first and second questions are same as the second and the third questions of the questionnaire of the other treatments. That is, there is no anchoring in this treatment.

After all participants were seated in the classroom, three kinds of prior questionnaires were distributed randomly to each participant before distributing the instruction. Participants were not informed about these three kinds of questionnaires. After they answered the questionnaires, they were instructed to flip back the questionnaire sheet and put it aside on the desk.

After all participants answered the prior questionnaire, each of them received a large envelope containing a piece of double-sided paper with the instruction on the front page and the record field and ex-post questionnaire on the back side, a blank receipt, a small envelope A containing a worksheet for the task, and a small envelope B containing three 500-yen coins and five 100-yen coins.[1] Subsequently, the instruction was read aloud by the experimenter.

Participants started the task at a signal from the experimenter. The worksheet consisted of 20 matrices, each based on a set of 12 three-digit numbers (e.g., 6.59). Participants had five minutes to find two numbers and to circle the two numbers per matrix that added up to 10.

Next, participants were instructed to score their own answer and memorize the number of correct answers. After the scoring, they put their worksheet back in envelope A, walked to the large box located in front of the classroom and put the envelope in the box.

After all participants returned to their seats, they took the money equal to (the number of correct answers) $\times$ 100 JPY from envelope B and put them into their purses or pockets. Next, they wrote down the number of correct answers in the record sheet and answered the ex-post questionnaire. Then they put the prior questionnaire, the record

[1] The experimental instruction, record field and ex-post questionnaire, and prior questionnaire are provided in Appendices A, B, and C, respectively.

sheet, and the remaining money in envelope B into the large envelope and put it in the large box in front of the classroom. Finally, they wrote receipts and put it in the large box in front of the classroom.

All participants received the same worksheet to solve, except that a single number was unique for each participant. One of the three-digit numbers in the matrix used as an example on the instruction matched the unique number on the corresponding worksheet. This allowed us to match the worksheet with the record sheet of each participant. Hence, we could compute the difference between self-reported performance and actual performance.[2]

2.2. Overview of the experiment

The experiment was conducted at Hiroshima City University from June 2016 to July 2017. A total of 244 undergraduate students (129 males and 115 females) participated in only one of the three sessions. It took about 30 minutes for each session and the average reward was 1,083 JPY.

3. Results

We omitted four data without an expected reward in the prior questionnaire. Furthermore, we omitted three data with an expected reward of more than 20,000 JPY since it seemed that those who answered the expected reward as more than 20,000 JPY answered jokily.[3]

3.1. Existence of cheating

We could confirm that there were 67 self-reported performances that were larger than the actual performances; these excessive self-reports might be mere errors. If they were errors, it was expected that there were a similar number of self-reported performances that were smaller than the actual performances. However, there were only five under-self-reports, which indicates that most of the 67 excessive self-reports were based on cheating.

3.2. Treatment effects

First, the numbers of correct answers in the no anchoring, the anchoring 100, the

[2] This method is adopted in Zhong et al. (2010).
[3] We got the same result even if we included the three data.

anchoring 2000, and the anchoring 8000 treatments were 10.1, 10.2, 10.1, and 9.4, respectively. There were no significant differences between them.

Table 1 indicates the mean values of three indexes of cheat in each treatment. *Cheat* is a dummy variable that is equal to 1 if a self-reported performance was larger than an actual performance, and 0 otherwise. Hence, the average of *Cheat* represents the ratio of cheating to participants. The number of cheat is the number of self-reported performance minus actual performance. The rate of cheat is the ratio of the number of cheat to 20 minus actual performance, that is, the ratio of the number of cheat to the maximum number of cheating.

Table 1. Mean values of indexes of cheat in each experimental treatment.

Treatment	Freq.	*Cheat*	Number of cheat	Rate of cheat
No anchoring	57	0.281	0.614	0.066
Anchoring 100	61	0.213	0.541	0.058
Anchoring 2000	61	0.295	1.393	0.135
Anchoring 8000	58	0.345	0.845	0.092
Total	237	0.283	0.852	0.088

We found a significant difference in *Cheat* between the anchoring 100 and anchoring 8000 treatments according to the proportion test (one-sided, p value = 0.054).[4] This supports our Hypothesis 1.

Table 2. Mean values of the expected reward and rate of participants facing loss frame.

Treatment	Expected reward	Loss frame
No anchoring	1,862.3	0.491
Anchoring 100	691.8	0.213
Anchoring 2000	1,549.3	0.492
Anchoring 8000	3,020.9	0.621
Total	1,764.0	0.451

The second column of Table 2 indicates the mean values of the expected reward. The expected reward of the anchoring 100 treatment is significantly lower than that of other treatments (t test and Wilcoxon rank sum test, both p values < 0.01). Furthermore, the

[4] As for the number of cheat and the rate of cheat, we found no significant differences between treatments.

expected reward of the anchoring 8000 treatment is significantly higher than that of the anchoring 2000 treatment (p value < 0.01 for t-test and p value < 0.1 for Wilcoxon rank sum test) and the expected reward of the anchoring 8000 treatment is significantly higher than that of the no anchoring treatment (p value < 0.05 for t-test). These results support Hypothesis 2.

The third column of Table 2 indicates the mean values of "*Loss frame*," which is a dummy variable that is equal to 1 if an expected reward is smaller than the fair reward, and 0 otherwise. According to the proportion test, the rate of participants facing the loss frame in the anchoring 100 treatment is significantly lower than that in other treatments (p value < 0.01 in each case). Furthermore, the rate of participants facing the loss frame in the anchoring 8000 treatment is significantly higher than that in the no anchoring and anchoring 2000 treatments (one-sided, p value = 0.08 in either case). These results support Hypothesis 3.

3.3. Frame effects

Table 3 indicates the mean values of three indexes of cheat when participants face loss frame or non-loss frame.

Table 3. Mean values of indexes of cheat under each frame.

	Freq.	*Cheat*	Number of cheat	Rate of cheat
Non-loss frame	130	0.208	0.592	0.064
Loss frame	107	0.374	1.168	0.118
Total	237	0.283	0.852	0.088

We found a significant difference in *Cheat* between the loss frame and non-loss frame (p value < 0.01). Furthermore, the number of cheat is significantly higher in the loss frame than in the non-loss frame (p value < 0.1 for t test and p value < 0.01 for Wilcoxon rank sum test). Similarly, the rate of cheat is significantly higher in the loss frame than in the non-loss frame (p value < 0.1 for t test and p value < 0.05 for Wilcoxon rank sum test). These results support Hypothesis 4.

3.4. Cheat and individual attribution

Table 4 shows the correlation coefficients between indexes of cheat and individual attribution. In this table, *Male* is the dummy variable equal to 1 if the participant is male and 0 otherwise. *Calculation* is the dummy variable equal to 1 if the participant answers

“a. Yes, very much” or “b. Yes” to the question “Are you good at calculating?” in the ex-post questionnaire and 0 otherwise. *Chance of rain* is the answer to the question “I go outside with an umbrella if a chance of rain forecast is higher or equal to ____ %” in the ex-post questionnaire. This answer shows risk attitude. The less the percentage is, the more risk aversion it shows.

From the table, it can be found that the number of cheat and the rate of cheat correlate with *Calculation*, and all the three indexes of cheat correlate with *Chance of rain*. These results indicate that the dishonest behavior is related with the calculation ability and the risk attitude.

Table 4. Correlation coefficients between indexes of cheat and individual attribution

	Male	*Calculation*	*Chance of rain*
Cheat	-0.03	0.03	0.12*
Number of cheat	0.01	0.23***	0.12*
Rate of cheat	0.03	0.26***	0.15**

*p < 0.1, **p < 0.05, ***p < 0.01.

4. Conclusion

In this study, we conducted the experiments on dishonest behavior after anchoring the participants’ expected reward. We found that those who were anchored to high reward behaved less honestly than those who were anchored to low reward. This is because the anchoring changed participants’ expected reward, while this changed expected reward served as participants’ reference point to affect the likelihood of facing a loss frame where dishonest behaviors are more likely to occur. This result suggests the possibility that careless increase in people’s expected reward in business increases their dishonest behavior. While increasing employees’ expected reward is commonly considered as an incentive to boost their effort level, employers should consider the possibility of going in a completely different direction. However, designing a suitable mechanism to let only the positive effect of increasing the expected reward to materialize is still an open question that needs to be answered.

Furthermore, we found a significant correlation between participants’ dishonest behavior and their calculation ability and risk attitude. However, since the calculation ability and risk attitude used here were self-reported by the participants, it would be more ideal to have some objective measures instead of these subjective ones. Further detailed research is required to explore this relationship.

Appendix A. Experimental instructions

Instruction

Distribution: Confirm that the following are in the large envelope.

Instruction (This paper)
Envelope A (Do not look inside before being instructed to do so)
Envelope B
Blank receipt (Do not write before being instructed to do so)

Please confirm that there are 2,000 JPY (three 500-yen coins, five 100-yen coins). Please put back the coins in envelope B after confirmation.

Task: You will engage in the task to find two numbers whose sum is 10 from twelve numbers and to circle the two numbers.

Example

6.59	6.67	7.44
4.01	0.74	0.67
2.25	9.59	1.34
3.33	8.67	2.79

In envelope A, there is a worksheet containing 20 problems corresponding to the problem explained above. Solve these problems as many as possible in five minutes.

Reward: You will receive 100 JPY per one correct answer.

Procedure:

1. At a signal from the instructor, you will draw the worksheet from the envelope A and start to solve the problems.
2. At a signal from the instructor, you must finish the task.
3. Score your worksheet by yourself and memorize the number of the correct answers.
4. Put your worksheet into envelope A, take it to the box in front of the room, and put it in the box.
5. Take out the coins from envelope B equal to hundredfold of the number of the correct answers and put them into your wallet or pocket.
6. Write the number of correct answers on the recording field at the back of this paper.

7. Answer the questionnaire at the back of this paper.
8. Put the prior questionnaire, the record sheet (this paper) and envelope B into the large envelope. Do not put the blank receipt.
9. Take the large envelope and put it in the box in front of the room.
10. Fill out the receipt. Then, put it in the box in front of the room.

Appendix B. Recording field and ex-post questionnaire

Result and questionnaire

Recording field (the number of correct answers)

Questionnaire

Please answer (circle or fill in) the following:

1. Sex: a. Male b. Female

2. Age: _____ years old.

3. Faculty: a. International Studies b. Information Sciences c. Faculty of Arts

4. I go outside with an umbrella if a chance of rain forecast is higher or equal to _____ %.

5. Are you good at calculating?
   a. Yes, very much b. Yes c. Neither yes nor no d. I am not good at calculating

6. Do you live in family home? a. Yes b. No

7. What is your monthly living expense?

About _____ thousand JPY.

Appendix C. Prior questionnaire of the anchoring 100 treatment

Prior questionnaire

Do you expect to earn 100 JPY or more in the experiment?

(Yes ・ No)

How much money do you expect to earn in the experiment?

_____ Yen

How will you spend the money if you earn in this experiment? Please write down a simple plan.

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