Gender Differences in Repeated Dishonest Behavior: Experimental Evidence*

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Abstract

We investigate gender difference in lying behavior when the opportunity to tell lies is repeated. In specific, we distinguish the situations in which such an opportunity can be planned versus when it comes as a surprise. We use data from an existing study (Chowdhury et al., 2021) and show that when the opportunity to tell a lie comes as a surprise, then on the first occasion, males lie more than females. However, when telling lies can be planned, there is no gender difference in telling a lie. When planning is possible, females tell more lies in the first occasion than when it is not. Males do not show such behavior. On the second and final occasion, males lie more than females only when they either could not plan but had an opportunity to lie before or could plan but did not have to tell a lie before.

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1. Introduction

Dishonest behavior has always been an active research area in philosophy, psychology, and economics. Behavioral economists extensively investigated dishonesty, in specific the behavior in lying. Many theoretical studies (e.g., Cartwright and Menezes, 2014), surveys (e.g., Bucciol et al., 2013), laboratory experiments (e.g., Fischbacher and Follmi-Heusi, 2013), field experiments (e.g., Azar et al., 2013) and neuroscience experiments (e.g., Garrett et al., 2016) have been carried out to understand lying behavior. Overall, various socio-economic factors such as demography, norm, context, bias, etc., turn out to be significant predictors for telling lies. However, the effects of one of the main demographic factors, gender, remains debated. Although the data from various surveys and meta-analyses show that males lie more than females, this difference depends heavily on the background, context, stake size, and task.[1]

Jacobsen et al. (2018) survey the literature on dishonesty with more than a hundred studies from economics, psychology, and management. They conclude that dishonesty is sensitive to various behavioral components such as decision contexts, reciprocity, state of mind, etc. Abeler et al. (2019) use data from 90 experimental studies and run their own experiments to understand the motives behind telling lies. One of the results that stood out from these studies (and the meta-analysis by Rosenbaum et al., 2014) is that overall females are less dishonest than males.

A majority of the individual studies with various frames such as theft (Friesen and Gangadharan, 2012), acquiring undeserved payment (Azar et al., 2013), self-reported outcome (Ward and Beck, 1990; Conrads et al., 2013), group-setting (Muehlheusser et al., 2015), etc., find females to tell fewer lies. Dreber and Johanneson (2008) also find the same in a sender-receiver game. However, Gylfason et al. (2013) replicate that design and could not find such an effect. Childs (2012) also find no gender difference in that game for high stake decisions. Gino et al. (2013) show that when females lag behind in a math-based competition, they use more deception. Similarly, Gino and Pierce (2010) find that there is no gender difference in dishonest behavior when it is aimed at reducing (perceived unfair) inequality. Holm and Kawagoe (2010) illustrate no gender effect in lying in case of face-to-face interaction.

Hence, whereas there is a large existing body of literature documenting gender differences in lying, the conclusion still remains incomplete and demands further research on the context and

[1] Neuroscience studies also show mixed results. Studies such as Marchewka et al. (2012), who ask subjects to tell lies, find gender differences; but Zhang et al. (2017) elicit lying behavior and could not find such a result.

structure for which such gender differences can be obtained. Moreover, in real life, the opportunity to tell lies is often repeated. Whereas there are studies that consider lies in repeated settings (e.g., Rilke et al., 2016; Belot and van der Veen, 2019), no research investigated gender difference in such a situation. We focus precisely on the gender difference in repeated lying and fill in that gap in the literature. Specifically, we study (i) whether there is a gender difference when the opportunity to tell lies occurs repeatedly; and (ii) whether there is a gender difference when such opportunities to tell lies can be planned versus when it cannot.

We use data from an existing experiment (Chowdhury et al., 2021) in which subjects make two consecutive decisions. Each time they may have an opportunity to tell a lie that gives a higher payoff than telling the truth. Depending on the treatment, either they are aware of the two tasks beforehand and can pre-plan their lies, or they learn about the individual task in each period and cannot make such a plan. The results show that when subjects are able to pre-plan, then they lie more in the first task. However, when they could not pre-plan, then they lie more in the second task only when they had a chance to lie earlier. The authors explain these results in terms of moral cleansing and behavioral spillover, but they do not examine any gender effect.

We investigate the data further and analyze the gender-specific effects. We find that when the subjects could not pre-plan, then in the first task males lie more than females. But when it can be pre-planned, then there is no such gender difference. This is because females tell more lies when they can pre-plan, but males do not do so. In the second task, males lie more when they could pre-plan but did not get the opportunity to lie earlier, or when they could not pre-plan but had the opportunity earlier. These results contribute to the divided literature on the gender difference in lying and show that context, earlier experience, and the possibilities to pre-plan can explain gender difference in dishonest behavior.

2. Experimental Design

Chowdhury et al. (2021) design a two-stage individual decision-making experiment with two tasks to understand dishonest behavior, where the subjects could either plan beforehand to tell a lie in each task or not according to the treatment. They describe that "*In each stage, a subject observed a picture of a coin. Observing the picture of the coin, subjects completed a sentence "_____ side is up" by choosing 'Head' or 'Tail.' Regardless of whether the head or the tail appeared on the screen, in each stage, the subject could earn more money if he/she reported 'Head' instead of reporting 'Tail.*'" The instructions are in the Appendix.

In either stage, the subjects did not know what picture they will observe. But by treatment design, in the first stage, half of the subjects observed 'Head' (H) and the other half observed 'Tail' (T); and all the subjects observed 'Tail' in the second stage.[2] Furthermore, in two different treatments, either the informational situation was 'Myopic' (M), i.e., the subjects were given the instructions of only the imminent task before each stage began; or it was 'Planned' (P) in which the subjects were given the description of the whole experiment about both the stages at the beginning. As a result, subjects in the Planned treatments could make a plan for their action in each stage, but subjects in the Myopic treatment could not do so.

Hence, there were a total of four treatments in which subjects were: (1) Myopic and observed Head in stage 1 or **MH**; (2) Myopic and observed Tail in stage 1 or **MT**; (3) Planned and observed Head in stage 1 or **PH**; and (4) Planned and observed Tail in stage 1 or **PT**. Although the experiment had evenly distributed subjects in terms of gender (46.4% female), Chowdhury et al. (2021) did not study any gender effect. Table 1 shows the gender distribution by treatment.

Table 1. Subject distribution by treatment and gender

Treatments	**MH**	**MT**	**PH**	**PT**
Female	24	21	24	29
Male	22	28	25	21
Total	46	49	49	50

The original aim of the design was to investigate whether the repeated opportunity to tell lies with planning can affect dishonest behavior, since being able to plan may make subjects to be victim of behavioral biases such as moral cleansing (Gneezy et al., 2014), or spillover (Garett et al., 2016). Chowdhury et al. (2021) found that being able to pre-plan made subjects tell more lies in the first stage. Moreover, behavioral spillover persisted, among myopic subjects, i.e., they told more lies in the second stage if they had an opportunity to tell lies in the first stage.

The computerized between-subject experiment was run at Yonsei University, South Korea, through Google survey. Yonsei University Ethics approval (7001988-201808-HR-220-06) was

[2] In the first stage, a subject earned 5000 KRW (South Korean Won) by reporting 'Head', and 0 KRW by reporting 'Tail'. In the second stage, a subject earned 2000 KRW by reporting 'Head', and 1000 KRW by reporting 'Tail'. Note that in either stage, a subject observing a 'Tail' would have to tell a lie and report 'Head', in case they intend to obtain the higher payoff; but a subject observing 'Head' would not have to do so.

obtained for this project. A post-experiment survey was also run to collect the demographic information of the subjects. The subjects were South Korean students at Yonsei University recruited by email. They did not participate in any economics experiment before. Each session took about half an hour, and the average payment was KRW 8685 (about 8 USD).

3. Results

3.1 Gender differences in Stage 1

Recall that the subjects who observed Head in the first stage (treatments MH and PH) did not have to tell a lie to earn more payoff. Indeed, none told a lie in the first stage of those two treatments. Hence, we focus on treatments MT and PT and the corresponding behavior across gender. Table 2 reports the proportion of subjects telling a lie in MT and PT, divided by gender.

Table 2. Proportion of subjects lying in the first stage

Treatment	MT	PT	Total
Female	0.429	0.810	0.289
Male	0.714	0.759	0.404
Total	0.592	0.780	0.351

The last row of Table 2 reaffirms the Chowdhury et al. (2021) result that overall subjects who can plan for both stages (PT) tell more lies than their myopic counterparts (MT). Note, though, that this overall treatment effect is driven by the difference in behavior by females. Whereas only 42.9% of myopic females tell a lie; 81% of females, who can pre-plan, do so. Compared to this, 71.4% of myopic males and 75.9% of males who can pre-plan to tell a lie. To test the significance of this observation, we ran pairwise Mann-Whitney Wilcoxon tests. It shows that there is no significant difference in male dishonest behavior across treatments ($p=0.706$), but more females tell lies in PT than in MT ($p=0.012$). This gives our first result.

Result 1 (within gender). *In the first stage, the opportunity to pre-plan does not affect male lying behavior; but such an opportunity significantly increases the proportion of females lying*.

Note from the last column of Table 2 that across treatments, overall, more proportion of males (40.4%) tell a lie compared to their female counterparts (28.9%). This is a relatively frequent result observed in the literature, especially on experiments requiring self-reports. However,

looking closer, there is a strong difference in such behavior in terms of the opportunity to pre-plan. When all the subjects are myopic (MT), then the males tell more lies (71.4%) compared to the females (28.9%). However, this result seems to not hold when both males and females can pre-plan (PT). To test this, we again run pairwise Mann-Whitney-Wilcoxon tests. Indeed, it turns out that in MT, there is a significant gender difference (p=0.0463); but with the opportunity to pre-plan, there is no significant difference in the proportion of male and females lying (p=0.6712). This is summarized below.

Result 2 (between gender). *When telling lies cannot be pre-planned, then males lie more than females in the first stage. However, when it can be pre-planned, then there is no gender difference in telling lies*.

We then run two probit regressions (by gender) in which the dependent variable takes the value 1 if the subject reported a lie, and 0 otherwise. The explanatory variables are the treatment dummy (whether pre-planning was possible) and the age of the subject. Supporting the non-parametric results, the treatment dummy is not significant for male subjects, but it is positive and significant for females. The regression results are included in Table 3.

Table 4. Probit regression: Lying in the first stage.

Lying in the first stage =1.	Male	Female
Planned	0.173	1.083**
	(0.363)	(0.439)
Age	-0.060	-0.017
	(0.081)	(0.082)
Constant	2.024	0.193
	(2.002)	(1.852)
# of Obs.	57	42

Note. *, **, and *** denote significance at 10%, 5% and 1% level. The dependent variable takes a value 1 if the subject lied in the first stage, and 0 otherwise. 'Planned' is a dummy variable that takes value 1 for P treatment, and 0 for M treatment.

Both Result 1 and Result 2 are new in the literature and are of interest for two reasons. First, no existing study investigated gender differences in telling repeated lies. These results imply that when the opportunity to tell a lie comes as a surprise, then in the first instance, males tell lies more than females, but such gender difference does not persist when telling lies can be pre-planned. Since males do not change their behavior, but females tell more lies in case of pre-planning, overall dishonest behavior on the outset also increases.

The existing literature reports that females resort to dishonesty more when they are reminded that they can do so (Fosgaard et al., 2013), or they can make an excuse (Ward and Beck, 1990) to do so; but this is not the case for males. Hence, when females can pre-plan, and pre-planning works similar to a reminder (that cheating is possible) or it prepares the females to make excuses for the immediate task, then it can explain Result 1 and Result 2.

3.2 Gender differences in Stage 2

Next, we focus on the lying behavior in the second stage. This is important to observe because the ability to pre-plan triggers moral cleansing effect on the subjects (Chowdhury et al., 2021), but this effect may be different across gender. In Table 3, we report the proportion of subjects telling lies in the second stage for each treatment separated by gender. Similar to the majority of the literature, males overall resort to more lies than their female counterparts (last column). However, there are gender-specific differences within treatments. It seems that the overall gender difference in the second stage is driven by males lying more in MT and PH.

Table 3. Proportion of subjects lying in the second stage

Treatment	MH	MT	PH	PT	Total
Female	0.333	0.333	0.292	0.571	0.378
Male	0.273	0.714	0.760	0.517	0.577
Total	0.304	0.551	0.531	0.540	0.485

To test these, we again run pairwise Mann-Whitney-Wilcoxon tests between genders for each treatment. The tests show no gender difference for MH and PT ($p>0.10$ for both). However, it shows a higher proportion of male lying in MT ($p=0.009$) as well as in PH ($p=0.001$).

Result 3 (between gender). *In the second stage, males lie more than females only when they could not plan but had an opportunity to tell a lie before, or they could plan but did not have to tell a lie before*.

To investigate further, we focus on pairwise treatment effects for each gender. When the subjects did not have to tell a lie to earn more in the first stage, then only 27.3% of myopic males (MH) tell a lie in the second stage, but an opportunity to pre-plan (PH) makes 76% of males lie in the second stage. A Mann-Whitney-Wilcoxon test shows that this difference is significant ($p=0.001$) as well. Pre-planning does not have such an effect on female subjects

(p=0.758). When subjects had an opportunity to tell a lie earlier, and they were myopic (MT) versus they could pre-plan (PT) then the difference is not significant for any gender.

Result 4 (within gender). *Pre-planning increases lying behavior only within males in the second stage when they did not have an opportunity to tell a lie in the first stage*.

We also run a set of probit regressions (reported in Table 5) with the data pair MH+PH and MT+PT. The dependent variable takes value 1 when the subject lies in the second stage and 0 otherwise. The independent variables are three interaction dummies between treatment P and gender; and age ('lying in stage 1' is dropped because of collinearity). For the data MT+PT, the coefficient for the variable 'female and M treatment' is negative and significant, and for the data MH+PH, the coefficient for the variable 'male and P treatment' is positive and significant, supporting Result 3 and Result 4, respectively. Moreover, the coefficient for 'age' is negative and significant, meaning younger people tell more lies. This is in the same line with what the literature (e.g., Conrads et al., 2013; Bucciol et al., 2013; Abeler et al., 2019 etc.) has found.

Table 5. Probit regression: Lying in the second stage.

Lying in the second stage=1.	MH+PH	MT+PT
Planned=0 & Female	-0.117	-1.269***
	(0.418)	(0.406)
Planned=1 & Male	1.384***	-0.444
	(0.406)	(0.349)
Planned=1 & Female	-0.155	-0.454
	(0.412)	(0.384)
Age	-0.124*	-0.125**
	(0.064)	(0.057)
Constant	2.416	3.614**
	(1.583)	(1.421)
# of Obs.	95	99

Note. *, **, and *** denote significance at the 10%, 5% and 1% level. The dependent variable takes the value 1 if the subject lied in the second stage, and 0 otherwise. 'Planned' is a dummy variable that takes the value 1 for P treatment, and 0 for M treatment.

4. Discussion

We investigate gender differences in telling lies when the opportunity to tell lies can be repeated, and it may be possible to pre-plan lying behavior. We contribute to the rich literature on the gender difference in lying in two distinct ways. First, to the best of our knowledge, this is the first study in which gender differences in repeated dishonest behavior is documented. Second,

this is the first to investigate gender differences in which dishonest behavior can be pre-planned.

We find overall support to the often found result in the literature that males tell lies more than females. Adding to the literature, we find that when pre-planning is not possible, then males tell more lies than females in the first opportunity. But this difference disappears when pre-planning becomes possible. This is because females tell more lies in the immediate stage if they know that there will be further opportunity to tell lies in the future. After the opportunity to tell a lie is repeated, males tell more lie than females only when they had an opportunity to tell a lie earlier but could not plan for it.

This study can be extended in various ways. First, the number of opportunities to tell lies can be increased, and the robustness of these results can be tested. Second, the type of lie can be modified to include socially justified 'white lies.' Erat and Gneezy (2012) found that females tell such white lies more than males, but testing it in a repeated setting or in a setting where it can be planned is yet to be investigated. Third, the current structure allows the subjects to make individual decisions. Introducing games in which agents interact with each other repeatedly and can pre-plan their lies and investigating gender differences would be interesting to observe. Finally, the experiment was run in South Korea. Replicating similar studies in other countries and cultures would be useful.

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Appendix: Instructions

<Screen 1> [For all treatments]

Thank you for participating in our experiment. Please read the instruction carefully. Please wait for further instruction from the experimenter.

<Screen 2> [Only for PH and PT]

You will make two similar decisions in this experiment. In the next page, you will see either "the picture side" or "the number side" of a coin.

[picture side shown] & [number side shown]

After seeing the side of a coin in the next page, you choose to report either "the picture side appeared" or "the number side appeared."

- If you choose to report that "the picture side appeared," you obtain X.
- If you choose to report that "the number side appeared," you obtain Y.
- The amount of money you obtain depends only on your report.

In your first decision making problem, X is KRW 5,000 and Y is KRW 0.

In your second decision making problem, X is KRW 2,000 and Y is KRW 1,000.

In the next page, either "the picture side" or "the number side" of a coin will appear. Please think about what your decision will be.

In your first decision making problem, what would be your report if "the picture side" of a coin appears? What if "the number side" of a coin appears?

In your second decision making problem, what would be your report if "the picture side" of a coin appears? What if "the number side" of a coin appears?

If you have any question, please raise your hand.

<Screen 3> [For all treatments]

Decision making 1

Your first decision making problem is the following. In the next page, you will see either "the picture side" or "the number side" of a coin.

[picture side shown] & [number side shown]

After seeing the side of a coin in the next page, you choose to report either “picture side appeared” or “number side appeared.”

- If you choose to report “the picture side appeared,” you obtain KRW 5,000.
- If you choose to report “the number side appeared,” you obtain KRW 0.
- The amount of money you obtain depends only on your report.

If you have any question, please raise your hand.

<Screen 4> [For all treatments]

You choose to report either “picture side appeared” or “number side appeared.”

- If you choose to report “the picture side appeared,” you obtain KRW 5,000.
- If you choose to report “the number side appeared,” you obtain KRW 0.

[picture side shown in MH and PH while number side shown in MT and PT]

The _____ of a coin appeared.

⊙ picture side

⊙ number side

<Screen 5> [For all treatments]

Decision making 2

Your second decision making problem is the following. In the next page, you will see again either “the picture side” or “the number side” of a coin.

After seeing the side of a coin in the next page, you choose to report either “the picture side appeared” or “the number side appeared.”

- If you choose to report “the picture side appeared,” you obtain KRW 2,000.
- If you choose to report “the number side appeared,” you obtain KRW 1,000.

 The amount of money you obtain depends only on your report.

If you have any question, please raise your hand.

<Screen 6> [For all treatments]

You choose to report either “the picture side appeared” or “the number side appeared.”

 If you choose to report “the picture side appeared,” you obtain KRW 2,000.

 If you choose to report “the number side appeared,” you obtain KRW 1,000.

[Number side shown in all treatments]

The _____ of a coin appeared.

⊙ picture side

⊙ number side