Binding lies

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Do we feel bound by our own misrepresentations? Does one act of cheating compel the cheater to make subsequent choices that maintain the false image even at a cost? To answer these questions we employed a two-task paradigm such that in the first task the participants could benefit from false reporting of private observations whereas in the second they could benefit from making a prediction in line with their actual, rather than their previously reported observations. Thus, for those participants who inflated their report during the first task, sticking with that report for the second task was likely to lead to a loss, whereas deviating from it would imply that they had lied. Data from three experiments (total N = 116) indicate that, having lied, participants were ready to suffer future loss rather than admit, even if implicitly, that they had lied.

Keywords: lies, binding, motivation, profit, commitment, self-presentation, impression management

INTRODUCTION

There are many reasons why people lie: to obtain material benefits, to impress, to save themselves from embarrassment or inconvenience, to avoid punishment, to protect a relationship, or even to benefit others (through white lies) (Hample, 1980; Camden et al., 1984; DePaulo et al., 1996; DePaulo and Kashy, 1998; Robinson et al., 1998; Vrij, 2000).

Although often beneficial, lies also bear some costs: lies violate the actual or perceived consistency, which is one of the foundations of interpersonal relationships (Cialdini et al., 1995). Lies degrade the quality of the information conveyed, thus diminishing the ability to arrive at an informed, high-quality decision (Lewicki, 1983). Lies impair interpersonal communication (Lewicki, 1983; Millar and Tesser, 1988; Grice, 1989). Lying entails internal psychological costs to the liar (Mazar and Ariely, 2006; Mazar et al., 2008). Finally, getting caught lying arouses negative emotions that affect both sides (Lewicki, 1983; Sagarin et al., 1998), and may result in actions (like punishment) against the liar (e.g., Lewicki, 1983; Mazar et al., 2008). It is thus obvious that people would be more likely to lie when they are not afraid of being exposed (Schlenker, 1975; Baumeister and Jones, 1978; Silverman et al., 1979; Baumeister, 1982; Leary and Kowalski, 1990; Mazar et al., 2008).

It is often the case that the behavior that follows lying may determine the likelihood of the lie being detected. It is therefore plausible that people would choose to act in a way that minimizes the chance of being exposed. But to what extent? Would people be ready to forgo a benefit in order that a future action does not reveal that they had previously lied?

In the present study, we examined whether, and to what extent, a person who lied is committed to the lie. Specifically, we wished to see if future actions made by that person would be affected by the commitment even at the cost of forgoing some profit.

We are not the first to study behavior that follows dishonest acts. For example, Both Mazar et al. (2008) and Chance et al. (2011) gave participants tasks that assessed their ability, while having the opportunity to dishonestly inflate their performance. Following these tests participants were
asked to predict their future performance in a similar task, this time without the opportunity to lie (for predictions of their past performance see Mazar and Hawkins, 2015). Their payment was determined both by their performance and by the accuracy of their prediction. Participants over-estimated their future performance. The authors interpret this over-estimation as reflecting self-deception. We wish to consider an alternative interpretation: impression management.

The study of lying behavior suffers from an inherent difficulty: on the one hand, to identify an action as a lie, one needs to observe actual behavior and compare it to the true state of affairs which is known, both by the potential liar and by the researcher. On the other hand, if participants are aware of being watched (i.e., that their lies could be exposed), the probability of them lying decreases (Mazar and Ariely, 2006).

One of the ways to deal with this dilemma is to set up a situation in which it is clear that no single lie can be caught. At the same time, liars can be identified with high probability by the degree to which the aggregate of their single, unverifiable, reports deviates from some reference value. Such a reference point can be based on the behavior of other people who could not lie when performing a similar task (Mazar and Ariely, 2006; Mazar et al., 2008; Chance et al., 2011; Schurr et al., 2012) or on statistical probability (Shalvi et al., 2011; Fischbacher and Föllmi-Heusi, 2013; Hilbig and Hessler, 2013). In the present set of studies, we employed a paradigm of the latter type: the participants repeatedly performed a task in which they could falsely report a favorable outcome, with no fear of being caught. However, a comparison between the proportion of trials in which a favorable outcome was reported and the expected proportion of such outcomes could indicate whether the participants were likely to have lied. A subsequent task then tested how committed the participants were to their lies (if they lied). We describe our paradigm in the next section.

THE EXPERIMENTAL PARADIGM

The paradigm used here consisted of two tasks: a reporting task and a prediction task. In the reporting task the participants drew, privately, marbles from an opaque urn. The urn contained 100 marbles of two colors, and on each of 40 rounds the participants drew a marble and reported its color. One of the two colors was designated as the valuable color and reporting this color was rewarded. Thus in this task the participants had a financial reward. Their payment was determined both by their performance and by the accuracy of their prediction. Participants over-estimated their future performance. The authors interpret this over-estimation as reflecting self-deception. We wish to consider an alternative interpretation: impression management.

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to the incentivized reporting phase and blue in the unincentivized reporting phase), out of 40, that he or she had reported. At this stage the experimenter pulled the curtain aside, so the urn was visible to both the participant and the experimenter, and the predicting task began. The participant had to predict the number of marbles of the less common color in a sample of 40 marbles, drawn from the urn. After the prediction had been made and noted, the participant drew the marbles one at a time, and placed each marble in one of two separate containers, sorting the marbles by their color. Once 40 marbles had been drawn the experimenter and the participant counted the number of marbles of the relevant color together and compared it to the participant’s prediction.

In the incentivized reporting task, every time the participant pressed the “green” key, the computer added 0.5 NIS (New Israeli Shekels, 1 NIS being worth 0.26 $ at the time of the experiment) to the participant’s profits. It should be noted that the participants could report any color they wished without being exposed. The procedure of reporting in the second reporting phase was identical, but did not produce profit. This latter phase was introduced to make sure that the participants could correctly report the number of marbles of the infrequent color after 40 draws when there was no monetary incentive to inflate that number.

In the predicting task of both phases, payment was for accuracy in predicting the number of marbles of the infrequent color. The payment for a perfectly accurate prediction was an additional 5 NIS, and for a prediction that deviated by one from the number of marbles actually drawn it was 2 NIS. A prediction that deviated by more than one was not rewarded. Note that in the first phase this payment schedule could pose a dilemma for the participants who lied in the reporting task. On the one hand, their best prediction would have been the number of green marbles that they had actually drawn; on the other hand, if they were bound by their lies (i.e., lied and didn’t want to get caught lying) they should predict the number of green marbles that they reported in the previous task. Clearly, in the latter case, those who inflated the number of green marbles could expect to forgo the reward for accuracy of prediction.

**Participants**

Thirty four students of the Hebrew University of Jerusalem were recruited for the experiment. The average age was 25.36 years (SD = 3.42 years) one student was excluded from the analysis, because he admitted that he didn’t understand what was required of him. 14 of the 33 participants were females.

**Procedure**

Participants were tested individually in an empty classroom. The experimenter confirmed that the student could distinguish between the different colors of the marbles; those who had difficulty doing so were dismissed.

The instructions of the incentivized reporting task were read aloud and explained; written instructions were also available on paper in front of the participant. The same sequence of reading aloud and explaining, as well as providing written instructions, was true for all tasks.

After the instructions were explained, the participant went behind the curtain and started the task. Once the reporting task was over the prediction task started, with the participant predicting the number of green marbles that would be drawn out of 40 marbles. After that, the participant drew 40 marbles from the urn and sorted them by color into two boxes. The experimenter and the participant then counted the green marbles and the result was recorded. The second phase followed, starting with the reporting task and continuing with the prediction task for the blue/white urn. Finally, the total amount earned was calculated and paid, and the participant was dismissed.

**Results**

The mean number of the infrequent color, reported and predicted, for each phase and task, is presented in Figure 1. A two-way repeated measures ANOVA was conducted to test for the effects of Phase, Task, and their interaction. We found significant main effects of Phase, with the mean number higher in the first than in the second phase [\(F(1,32) = 10.583, \text{MSE} = 37.867, p = 0.003, \eta^2_p = 0.249\)], and of Task, with the mean number higher in the reporting than in the predicting task [\(F(1,32) = 6.145, \text{MSE} = 10.893, p = 0.019, \eta^2_p = 0.161\)]. The interaction was not significant \([F(1,32) = 0.950, \text{MSE} = 11.518, p = 0.337, \eta^2_p = 0.029]\).

While the results presented above capture the overall picture, it is easier to answer our research questions by reporting the results of pre-planned contrasts. First, the number of rewarding marbles reported in the first reporting task, in which misreporting was incentivized, was 19.55 – a value much higher than the value of 14, expected by chance \([t(32) = 4.67, p < 0.001]\). The prediction made following the incentivized reporting task, at 17.55, was also significantly larger than 14 \([t(32) = 4.36, p < 0.001]\), indicating that the participants, although predicting a value somewhat lower than the one they had reported, were still committed to their lies. In fact, significant differences were observed not only between the reporting in the incentivized and un incentivized tasks \([t(32) = 3.070, p = 0.004]\), but also, and most importantly, between the predictions made \([t(32) = 2.609, p = 0.014]\). The latter result indicates that the participants were ready to incur a loss in the predicting task to avoid having their prediction expose their lie.

As expected, the prediction following the un incentivized reporting task of the second phase (14.64) was not significantly higher than 14. However, the report in that phase \((15.48)\) was, in fact, higher \([t(32) = 2.488, p = 0.018]\). We have no explanation for this result but it may be another indication of binding lies: participants may have suspected that the second reporting task could somehow expose their having lied before. Either way, the value of 15.48 is significantly different from either 19.55 \([p = 0.004]\) or 17.55 \([p = 0.032]\) in the incentivized phase.

To check if these findings may have resulted from a misperception of a difference in the statistical properties of the two procedures, reporting (calculating the expected proportion when drawing from an urn with replacement) and predicting...
FIGURE 1 | Average of non-frequent marbles (reported or predicted) by phase (Experiment 1).

(calculate the expected proportion when drawing from an urn without replacement), we ran a control study with 39 subjects, none of whom had participated in the other study. In this study participants were presented with a written description of the procedure and results of the previously ran study, and asked what could have brought about these results. Only one of the 39 subjects gave an answer that could have been interpreted as referring to a difference between the statistical probabilities in the two procedures.

A comparison of earnings in the prediction tasks of the two phases (see Figure 2) revealed that earnings in the first phase (Mean Payment = 0.636 NIS, SD = 1.517) were indeed lower than that in the second phase [Mean Payment = 1.303 NIS, SD = 1.811; t(32) = 1.785, p = 0.042, one tailed]. In other words, had participants predicted what they must have actually observed while performing the incentivized reporting task they could have earned twice as much as they did. All in all, we conclude that the participants were willing to risk future gains rather than tacitly admit having lied before.

EXPERIMENT 2

It could be argued that the inflated number of green marbles reported (and then displayed) in the incentivized reporting task did not bind participants but served as an anchor for the next task. In other words, this claim means that the participants knew that while performing the reporting task they had retrieved fewer green marbles than they reported. It is therefore possible that, when they had to predict the number of green marbles that would be drawn; their correct estimate was drawn upward through anchoring, which resulted in an intermediate value.

In Experiment 2 we addressed the anchoring issue, while replicating the previous results.

Method

Experiment 2 was similar to Experiment 1, but included a preliminary, unincentivized reporting task, and no second phase.
In the preliminary reporting task the participants did exactly what they did later in the incentivized reporting task, but they did not get any money for reporting “green.” For the preliminary task to make sense we asked the participants to use tongs to pull the marbles out of the urn – which was no simple matter – the unincentivized reporting task was described as “practice.” At the end of the practice task the number of green marbles participants reported was presented to them on the computer screen. Following practice the participants performed the second, incentivized, reporting task followed by the prediction task – both identical to the tasks performed in Experiment 1 (except for the requirement to use tongs to draw marbles one by one). As before, in both reporting tasks it was possible for the participants to report that they had drawn a green marble even if it was of the other color. In this experiment the practice task served as a control in that it provided another possible anchor.

Participants
Thirty nine students of the Hebrew University of Jerusalem were recruited for the experiment. The average age was 25.64 years ($SD = 3.04$ years). Eighteen of the participants were females.

Procedure
The procedure was the same as the procedure of Experiment 1, except for the use of the tongs, the inclusion of a practice task, and the absence of a second phase.

Results
The average draws (reported and predicted) of the green marbles are presented for each task in Figure 3. We analyzed the results across all the participants with one-way repeated measures ANOVA. We found a significant difference between the three tasks [$F(2,76) = 9.398$, $MSE = 7.687$, $p < 0.001$, $\eta^2_p = 0.198$]. The mean reported in the first, unincentivized task was closest to the expected value of 14, the mean reported in the second, incentivized, task was much higher, and the mean in the predicting task was somewhere in between. A finer contrast analysis that compared the mean number of green marbles in the predicting task separately to the mean reported in the practice task and to that reported in the incentivized task showed the prediction to differ significantly from both [$F(1,38) = 4.787$, $MSE = 12.340$, $p = 0.035$, $\eta^2_p = 0.112$ and $F(1,38) = 6.050$, $MSE = 14.256$, $p = 0.019$, $\eta^2_p = 0.137$, for the practice and the incentivized reporting tasks, respectively]. We examined the differences between every two tasks with paired-sample $t$-tests. All of the differences were significant: the difference between the practice task and the incentivized reporting task [$t(38) = 3.841$, $p < 0.001$], the difference between the incentivized reporting task and the prediction task [$t(38) = 2.46$, $p = 0.019$], and the difference between the prediction task and the practice task [$t(38) = 2.188$, $p = 0.035$].

These results replicate the results of Experiment 1: apparently at least some of the participants reported more green marbles than they had really drawn, that is to say, they lied. In the prediction task the participants predicted a lower number of green marbles than they had reported, but their prediction was not as low as what they had most likely seen in the two preceding reporting tasks.

Because the number of rewarding marbles observed by each subject is unknown, it is impossible to calculate how much profit participants had foregone by being bound by their lies. For approximation we calculated the mean payment the participants would have earned had they predicted the expected value (14). In that case they would have earned 1.513 NIS (see Figure 4); the difference between that and what they earned is significant [$t(38) = 1.842$, $p = 0.036$, one tailed, paired sample $t$-test].

The number reported during practice also differed from the expected value (14) [$t(38) = 2.555$, $p = 0.015$]. We have no explanation for this deviation, which could have resulted by chance. In any case, it does not bear on our main finding.
In Experiment 1, we not only replicated the findings of Experiment 2 but also ruled out an alternative explanation based on anchoring. The participants sampled the urn twice, and could anchor on either of the two values reported. The up deviation of the predicted value (16.95) from both the value expected by chance (14) and the value reported and displayed in the practice task is a clear indication that participants decided to stick to their inflated reports. At the same time, the difference between the reporting that was incentivized (18.44) and the subsequent prediction indicates not only that the participants were likely aware of the true proportion of green marbles in the urn, but also that they tried to “reduce” the damage caused by sticking to their inflated reports.

EXPERIMENT 3

Our main thesis is that behavior following a lie is affected by the lie in that the liar attempts to ensure that the act of lying is not exposed, even at a cost. Still, it could be claimed that what we regarded as the tell-tale indication of such an attempt – the large deviation of the prediction from the value expected by chance – resulted from other factors such as a failure to correctly estimate the proportion of the infrequent-color (green) marbles in the urn, self-deception (as would be predicted by the theory of self-concept maintenance Mazar et al., 2008; Chance et al., 2011), or still, by some anchoring. To test these alternative explanations we created in Experiment 3 a non-binding situation: not only could participants exaggerate their “report” of the number of rewarding marbles drawn with impunity, but also no one could tell how many rewarding marbles they reported. Thus, it would be impossible to find out if their prediction differed from their report, which would have implicated them as liars. We reasoned that under such conditions people would not be bound to their lies. On the other hand, if inflated predictions were the results of failures of estimation, self-deception, or anchoring they would remain higher than expected by chance, as was observed in the previous two experiments.

Method

This experiment was similar to Experiment 2 but with some changes: only in the practice stage did participants report into a computer. In the second stage, to allow participants to inflate their “reports,” and still not be connected to that “report” (so that no one could tell if their prediction deviated from it), they had to count the number of draws and the number of green marbles for themselves. That way we could not tell, for any individual participant, how many green marbles she claimed to have drawn. Participants could use pen and paper but it was not obligatory. It was emphasized in the instructions that even if the participants were to use such aids, they would keep them and the experimenter would have no access to them.

At the end of the drawing the participant was presented with a large number of unmarked envelopes, each containing 40 0.50-shekel coins, and was asked to select one of the envelopes at random and take out as many coins as there were green marbles in the sample previously drawn, then place the unmarked envelope, with the remaining, unclaimed coins, in a large box. Because several participants performed the experiment at the same time we could not tell, for any individual participant, how many green marbles she had claimed to draw. At the same time, we could easily find out how many coins, on average, the participants had taken. Following that stage each participant engaged in the prediction task, in a different room.

Participants

Forty three students of the Hebrew University of Jerusalem were recruited for the experiment. The average age was 24.35 years (SD = 2.43 years). Nineteen of the participants were females.

Procedure

After the experimenter made sure that the participants could tell the difference between the marbles’ different colors they entered the lab in groups of 4–8 participants in each session. Each participant worked alone at her own pace in a different cubicle. It was made clear to the participants that the experimenter could not see what they were doing. The participants got the materials – urn, tongs, instructions, pen, and a sheet of paper – and began the practice task, reporting into the computer. When they finished doing that, they raised their hand and the experimenter came in and gave them the written instructions for the second task. He made sure that they understood the instructions and went into the other room. The participants repeated the procedure, this time without the computer.

After the participants put the envelope in the box, they took the same urn they used before and went to the next room, where they performed the prediction task as in Experiments 1 and 2.

Results

As mentioned before, the expected number of green marbles was 14. Figure 5 presents the average number of green marbles as reported in the practice task, as derived from the number of coins removed from the envelopes, and predicted. A one-way ANOVA revealed a significant effect of stage \( F(2,126) = 4.66, \text{MSE} = 21.625, p = 0.011, \eta^2_p = 0.069 \). A post hoc comparison revealed that the mean number of coins claimed (corresponding to the values “reported” in the incentivized stage) was significantly different from both the value reported in the practice task and that predicted \( (p = 0.031, p = 0.035 \text{ respectively}) \), whereas the values of the practice and the predicting task were not different from each other \( (p = 0.999) \). Furthermore, one sample t-test revealed that the average of the green marbles in the incentivized reporting task was significantly different from the expected value of 14 \( t(42) = 2.25, p = 0.016 \), whereas the other two values were not \( t(42) = -0.751, p = 0.457 \) for the practice task, and \( t(42) = -0.599, p = 0.533 \) for the predicting task. The earnings in the prediction phase (Mean Payment = 0.837, SD = 1.557) were not significantly different from 1.139, that they would have
earned had they predicted 14 \( t(42) = -0.897, p = 0.375 \) (see Figure 6).

The results of this experiment clearly demonstrate that when the lie was anonymous and there was no one who could call it out, the participants were no longer bound by it. Their predictions show that given such “non-bindingness” they easily made a prediction commensurate with the actual number of marbles of the infrequent color, and maximized their profits. It should be noted that, although in this experiment we couldn’t distinguish between lying and stealing as did Mazar and Zhong (2010), given that participants were instructed to take out the number they sampled, the excess coins they took can be regarded as stealing by lying.

**GENERAL DISCUSSION**

The goal of this research was to study aspects of behavior following a lie. Specifically, we asked to what extent people would be ready to forgo a benefit in order not to imply, by a future action, that they had previously lied. We devised a sequence of two tasks, both involving the state of the same world. The first task allowed for profitable, voluntary lying behavior, in which the participants were assured, by the nature of the task that the experimenter could not tell if and when they had lied. Yet, a comparison of the overall statistical characteristics of a participant’s report with the statistical characteristics of the environment could indicate the likelihood that lying had taken place. In the subsequent unexpected task, benefits would have been higher if the true state of the world, rather than that implied by one’s previous reports, were used. As the second task was unexpected, the benefits of previously reporting the true state of the world could not be foreseen. This setup created a possible dilemma for liars, because deviation from their report in the initial task would constitute an implicit admission of having lied. The way our participants resolved the dilemma, when it existed, allowed us to assess the degree to which false reports bound the participants later on.

In Experiment 1, we have shown that people are willing to risk future profit or even forgo it altogether, in order not to get caught in a lie. The explanation we offer for such behavior is that people are “bound” to a lie they told, and are compelled by it to a certain behavior. That is, after providing the experimenter with a false report of the proportion of the profitable marbles, that person feels committed to that false representation in the sense that the person subsequently continues to predict a higher proportion than the proportion that would have most probably yielded a larger gain (but which would have been hard to justify in light of the previous report).

In Experiment 2, we have replicated these results and eliminated an alternative explanation based on anchoring, by repeating the reporting task with no incentive to lie – a task in which reporting turned out to be much closer to the value expected on statistical grounds.

In Experiment 3, we have shown that when there is no audience to the false presentation then there is no commitment to the lie. By creating a situation of a non-binding lie and showing that in that case participants felt free to act differently (and in line with what was more profitable) in the reporting and the predicting task, we have dismissed alternative explanations like an inability to correctly estimate the proportion of marbles of the infrequent color in the urn, self-deception, or anchoring.

It is important to note that the commitment to the lie does not stem from the risk of punishment, as even if inconsistent reports in the two tasks indirectly indicated that a person had lied, there was no sanctioning mechanism in our studies. Furthermore, when misrepresentation cannot be detected, as in Experiment 3, participants did not seek to be coherent with their reports.
The theory of self-concept maintenance (Mazar et al., 2008) explains well why participants did not lie “all the way” when they had an opportunity to do so. It is possible that the extra gains they made were exactly what struck a balance between monetary temptation and keeping one's self-image intact. This theory also provides an explanation for the self-deception in performance prediction described in Chance et al. (2011). In the latter, participants may have been unaware of how much they were aided by the answers sheet, and that enabled them to deceive themselves unlike in our experiments. In the experiments reported here every lie was very prominent for the participants as they held the marble of the unprofitable color in their hand and clicked the profitable color key on the computer screen (Experiments 1 and 2) or marked it on paper (Experiment 3). It might be that failing to maintain a self-concept of honesty, people proceed to (perhaps less desirable) honest impression management. It could be that when participants in Mazar and Hawkins (2015) who inflated their performance evaluation after lying, may also have engaged in impression-management rather than in deceiving themselves.

The contrast in prediction behavior between Experiment 3 and the previous 2 experiments shows that the commitment to the lie is of impression management and not a result of self-deception. All in all our results indicate that people feel bound by their lies and that, once having told a lie, they are willing to risk future profits in order not to be exposed as having lied.

Not all lies commit liars. Additional research should address the motivation of lying and classify the situations in which lies bind the liar. We think that people sometimes use lies as means of impression management and, as long as possible, would prefer to deceive oneself rather than admit to have lied. But when this is impossible, looking honest would become an important target behavior, even if costly. Impression management could be particularly strong for lies in which one embellishes reality, presenting oneself as better or more competent than one really is. At the same time, impression management using lies could have a positive effect through binding, by becoming a commitment to the lie, a motivation and a tool for establishing and improving self-identity.

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The contrast in prediction behavior between Experiment 3 and the previous 2 experiments shows that the commitment to the lie is of impression management and not a result of self-deception. All in all our results indicate that people feel bound by their lies and that, once having told a lie, they are willing to risk future profits in order not to be exposed as having lied.

Not all lies commit liars. Additional research should address the motivation of lying and classify the situations in which lies bind the liar. We think that people sometimes use lies as means of impression management and, as long as possible, would prefer to deceive oneself rather than admit to have lied. But when this is impossible, looking honest would become an important target behavior, even if costly. Impression management could be particularly strong for lies in which one embellishes reality, presenting oneself as better or more competent than one really is. At the same time, impression management using lies could have a positive effect through binding, by becoming a commitment to the lie, a motivation and a tool for establishing and improving self-identity.