

Employee's lying behavior and the role of self-awareness

Abstract

Purpose. Employee's lying behavior has become ubiquitous at work, and managers are keen to know what can be done to curb such behavior. Managers often apply anti-lying strategies in their management and, in particular, the role of self-awareness on lying intervention has drawn academic attention recently. Drawing on multi-disciplinary literature, the current research aimed to investigate the efficacy of self-awareness in reducing lying behavior.

Method. Following the perspectives of positivism and deductive reasoning, a quasi-experimental research approach was adopted. Employees from Dijon, France were recruited as research participants. Based on the literature, different conditions (scenario manipulation) were designed and implemented in the laboratory, in which participants were exposed to pre-set lying opportunities and their responses were analyzed accordingly.

Findings. Unlike prior studies which praised the merits of self-awareness, we found that self-awareness did not decrease lying behavior, not encouraging the confession of lying either. Employees actually lied more when they believed other employees were lying.

Practical implications. We suggest managers not to rely on employee's self-awareness; rather, the concept of self-awareness should be incorporated into the work ethics, and managers should schedule regular workshops to keep employees informed of the importance of ethics. When employees are regularly reminded of the ethics and appreciate its importance, their intention of lying is more likely to decrease.

Originality/Value. To our knowledge, the current research is the first in its kind to investigate lying intervention of employees in the laboratory setting. Research findings have brought new insights into the lying intervention literature, which has important implication on the implementation of anti-lying strategies.

Keywords: Behavior; Employees; Lying; Mirror; Self-Awareness.

Introduction

In the workplace, the tension between honest and dishonest behavior has drawn public attention recently. Individually, an employee may cheat the performance outcome to get bonus, and a manager may manipulate the sales figures to cover the financial deficits. Collectively, a marketing firm may behave dishonestly by over-rating their products, so salesmen can persuade the customers to make more orders. Either individually or collectively, these behaviors share a common factor; that is, *lying*.

Lying brings interests to the liars but damages to the victims (Celse *et al.*, 2016; Choshen-Hillel, *et al.*, 2020; Mahmood *et al.*, 2021). Actually, employees, employers, organizations and societies all suffer from the detrimental consequences of lying, for instance, lying and fraud has accounted for \$600 billion annual loss in the US (Mazar *et al.*, 2008). Up to €80 billions on tax-cheat is found in France, accounting for nearly 25% of gross national tax *per annum* (Celse & Max, 2012). The Association of Certified Fraud Examiners (ACFE) also states that business enterprises globally suffer annual losses of \$2.9 trillion as a result of fraudulent activity such as lying and stealing at work (Wells, 2010). Given that lying is ubiquitous and its side effect is hefty, the fight against lying has become a priority for the organizational leaders and business owners, and hence more studies are called (Beck *et al.*, 2018; Sims, 2010).

In the current research, we would like to respond to such call by examining a specific type of lying intervention strategy, i.e., self-awareness. The concept of self-awareness was first discussed by Wicklund and Duval (1971), and scholars generally agree that self-awareness includes a sense of moral evaluation during the behavioral decision-making process, which helps refrain people from lying (Cappelen *et al.*, 2013; Fischbacher & Föllmi-Heusi, 2013). However, the refraining mechanism of self-awareness is not always clear, and how self-awareness stops lying is still unknown (Shalvi *et al.*, 2011; Shu *et al.*, 2012). Following this logic, we are keen to conduct a new research to further understand the role of self-awareness, with three important reasons: i). By investigating the role of self-awareness, we aim to bring new insights into the self-awareness literature, particularly from the perspective of employee dishonesty; ii). By researching the efficacy of self-awareness in lying intervention, we aim to build a richer understanding of refraining mechanism; and, finally, iii). By analyzing the lying intervention strategies, we wish to support managers to develop better anti-lying management policies.

Literature Review

Lying seems ubiquitous in the workplace and its examples are many and vary. For instance, employees may claim sick days when they are actually healthy. Team leaders may take credits for members' work and claim their own achievement. Job applicants may lie about their experiences and qualifications during the interviews, such as exaggerating their success and productivity. Workers may also conceal their mistakes and deceptively undermine others with whom they are competing for career opportunities. Employee's lying behavior has drawn academic attention recently and scholars are keen to analyze the reasons underlying the lying phenomenon (Buehl, Melchers, Macan & Kuhnel, 2019). Scholars have proposed a variety of reasons to explain the lying phenomenon, such as job attitude and conflicting expectation (Sims, 2010), employee's conscientiousness and emotional stability (Henle, Dineen & Duffy., 2019) and the relationship of co-workers (Beck, Bühren, Frank & Khachatryan, 2018). Among the diverse reasons, the most popular one is called trade-off (Becker, 1968), also known as *cost-benefit perspective* in recent empirical studies (Buehl *et al.*, 2019; Jensen & Raver, 2020).

Economically, the decision to act dishonestly (such as lying) depends on a trade-off between expected benefits and costs. The concept of trade-off can be interpreted via three dimensions: i). the expected benefits from engaging in dishonesty behavior; ii). the probability of being caught while engaging in such behaviour; and, finally, iii). the magnitude of penalty incurred if caught (*cf.* Becker, 1968; Rosenbaum, Billinger, & Stieglitz, 2014). Inspired by the construct of trade-off, numerous studies are conducted but their findings remain inconclusive. Scholars first suggest that increasing fraudulent gains (i.e., manipulating the first dimension) does not lead to more dishonesty (Cappelen *et al.*, 2013; Fischbacher & Föllmi-Heusi, 2013), and that increasing the probability of being caught (i.e., manipulating the second dimension) does not reduce dishonesty (Lewis *et al.*, 2012). Interestingly, prior studies indicate that, even when participants are granted a sound opportunity to lie for the biggest gain without being caught (i.e., manipulating the third dimension), they still refrain themselves from lying (Shalvi *et al.*, 2011). Following this line of research, even if lying benefits liars, the occurrence of lying does not necessarily increase along with benefits or decrease along with costs. There may be other factors to explain the lying mechanism such as how lying is triggered or restrained.

Mazar *et al.* (2008) proposed a theory of self-concept maintenance, describing a phenomenon that people may engage to *some level* in dishonest behavior, thereby benefiting from benefits of dishonesty, while maintaining their positive view about themselves in terms of being honest individuals. That is, people may behave dishonestly enough to profit (such as telling little lies) but honestly enough to delude themselves of their own integrity (such as thinking that little lies do not harm). Mazar *et al.*'s theory is grounded on two mechanisms: *categorization* and *attention to standards*. The former refers to the process in which ideas and objects are recognized, differentiated and understood (Cohen & Basu, 1987; Love, 2013). The latter refers to the attention that people give to their own standards of conduct. Campbell (1964) indicates that people often assimilate the norms and values of their society via various social activities, and that these norms and values serve as crucial reference (internal benchmark) for their decision-making; that is, a decision in congruence with these norms and values provides positive internal rewards, whereas a decision in opposition to these norms and values leads to negative internal rewards.

More specifically, Mazar *et al.*'s viewpoint helps explain why people lie less, despite of the fact that they are granted opportunities to lie for the bigger gains. Mazar *et al.*'s viewpoint also implies that a little bit of dishonesty gives a taste of profit without spoiling a positive self-view; for instance, people may grab benefits from lying, but still maintain their positive self-concept in terms of being moral individuals. In view of what has preceded, we propose that self-awareness is vital to the behavioral decision-making process. Based on the review of empirical research findings aforementioned, we also propose that self-awareness plays an important role, regulating the mechanism of lying engagement. This article now turns to discuss the role of self-awareness and its potential implication on behavior.

Self-awareness and its role in lying behavior

Broadly speaking, self-awareness is an extension of the self, reflecting on how people understand and evaluate themselves. Scholars indicate that self-awareness enables people to experience themselves as unique and separate individuals (Duval & Silvia, 2001; Philippe, 2003). With the aid of self-awareness, people are then empowered to make changes and to build on their areas of strength, as well as identify areas where they could improve (Susan, 1999). Wicklund and Duval (1971) have defined self-awareness

as a state in which the individuals evaluates themselves and attempts to attain correctness and consistency in their beliefs and behaviors, and self-awareness mediates both opinion change and performance facilitation. Simply put, self-awareness describes how people see themselves and represents the subjective knowledge of themselves, such as personal experiences, characters and feelings.

The construct of self-awareness may help explain employee's lying behavior in multiple aspects. To begin with, people often evaluate their behavior in line with their own internal values and standards before they engage in such behavior (Wicklund & Duval, 1971). Unlike the cost-benefit perspective (Becker, 1968), self-awareness highlights the potential impact of self on behavior. Self-focused attention leads people to examine their behavior with their own standards so a sense of psychological discomfort may arise if these standards are not met (Wicklund, 1975).

Next, in order to reduce the discrepancy between behavior and standards, people may withdraw from self-awareness or change their behavior to match their own standards. For instance, people tend to behave in accordance with their standards: they donate more (Froming, Nasby, & McManus, 1998), transgress less rules (Beaman *et al.*, 1979) and eat healthier (Sentryrz & Bushman, 1998). Moreover, a study indicates that people may lie significantly less when asked to sign a declaration form at the onset of the experiment; scholars have interpreted this phenomenon as activation of self-awareness, i.e., a signature on the form can activate a sense of self-awareness, affecting the lying tendency (Shu *et al.*, 2012). Similarly, honesty oath increases moral awareness, mitigating lying tendency (Beck *et al.*, 2018). With self-awareness in mind, people become prudent of their decision, they carefully think whether they should lie (e.g., is lying moral, will I be caught if I lie, should I lie or not?), and, consequently, they become less likely to lie.

Having said this, however, scholars have proposed mixed views about efficacy of self-awareness in curbing lying. Cappelen *et al.* (2013) first claim that non-economic aspects of the choice situation are crucial in understanding aversion to lying; that is, people are less likely to lie when the content of the message is personal and intuition related, and this phenomenon is salient for male participants. Cappelen *et al.* also found that, when all participants are given time to evaluate their decision (i.e., lying for profits), those who have stronger social and altruistic characteristics are less likely to lie. Next, Childs (2012)

discovers that lying behavior is related to gender difference; in a series of sender-receiver games, all participants are granted an opportunity to lie; yet, only female participants are less likely to lie when the monetary benefit is small (smaller stakes), but there is no difference in lying by gender when the benefit is increased (larger stakes). From a different but relevant perspective, envy restrains people from lying if lying brings greater benefits to others; that is, when lying benefits others more than the liar(s), liar(s) may feel envious and hence reduce the probability of lying (Celse *et al.*, 2016). In a similar vein, scholars have found that lying can be triggered by leaders and managers in the organization; that is, if employees feel their leaders lying, employees *per se* become more likely to lie (Celse & Chang, 2017).

In view of what has preceded, we are intrigued by the relationship between self-awareness and lying behavior. On the one hand, scholars indicate that self-awareness is related to lying behavior, refrain people from lying. On the other hand, however, scholars also claim that the influence of self-awareness on lying is not straightforward. Both viewpoints have merits in their respective perspectives, but their arguments are actually against each other. In order to enrich the understanding of the awareness-lying relationship, therefore, two propositions are proposed. Our first proposition is that self-awareness has ability to affect the decision-making process, which in turns curb the probability of lying (*as per earlier literature review*). Our second proposition is that, when people evaluate whether to lie, their self-awareness is not the only factor in their decision-making process and hence, their self-awareness may not affect lying tendency (*as per latter literature review*). Even when self-awareness is clearly present, it does not necessarily trigger a feeling of moral standard; for instance, if the cost-benefit ratio is in favor of the liars (such as low costs and high benefits), lying behavior may still occur. As such, we propose:

Hypothesis 1a: Self-awareness reduces lying behavior.

Hypothesis 1b: Self-awareness does not reduce lying behavior.

Self-awareness and its implication on the confession of lying

Prior studies have proposed two contradicting viewpoints to account for the awareness-lying relationship. Although both viewpoints are informative, their different arguments could not help clarify the mechanism of self-awareness in curbing lying behavior. The heterogeneity between two viewpoints

does not contribute to the amalgamation of lying literature either. Thus, we believe a new study to continue this line of research is essential, and we are keen to understand whether self-awareness is related to the confession of lying; specifically, can self-awareness encourage liars to confess to lying? This question is critical and meaningful, as the answer helps managers to understand the efficacy of self-awareness in reducing lying. To our knowledge, there is no clear answer available in the existing literature; nevertheless, recent studies have offered preliminary credence to explain the awareness-confession relationship.

To begin with, Beck *et al.* (2018) explain that people hardly lie if they cannot benefit from lying, and that moral awareness may help mitigate lying tendency. Beck *et al.*'s findings have highlighted the imperativeness of benefits in lying behavior. However, confession is different from lying in nature. In our opinion, confessing a lie is more challenging, as lying is immoral and thus it entails a feeling of guilty; the confession of lying aggravates such guilty feeling, as liars may receive blame, mock and punishment (Lewis *et al.*, 2012; Marzar, Amir & Ariely, 2008). To the liars, self-awareness seems to play a key role in their decision-making-process, helping them to decide whether they should confess to lying. If they do confess to lying, liars may feel guilty and receive severe punishment. If not, liars may still feel guilty but they can get away from punishment.

Additionally, the confession of lying may involve the risk of uncertainty and negative consequences. Although the self-awareness is operated in line with moral standards and encourages people to behave more positively and honestly (*cf.* Wicklund & Duval, 1971; Wicklund, 1975), making a confession puts liars in great pressure and faces uncertain outcomes. The confession of lying may receive positive feedback and respect, if the severity of lying is trivial and forgivable (Peer, Acquisti & Shalvi, 2014). But, when the nature of lying is important or sensitive, the story may be different. Actually, scholars have found that truth-telling is perilous and can damage liar's credibility immediately, and that the consequence of lying-confession is not always positive (Rosenbaum, Billinger & Stieglitz, 2014).

Altogether, prior studies suggest that confession has some merits, but its consequence carries risks such as sanction and punishment. Self-awareness helps encourage people to behave more honestly, but it

does not necessarily force liars to confess to lying, particularly when the outcomes of confession are unpredictable. As such, we propose:

Hypothesis 2: Self-awareness does not encourage people to confess to lying.

Method

Design

For the sake of research rigor, the measurement of research variables and their effect shall be conducted in reality (Bryman & Bell, 2015). That is, the current research shall recruit real-life employees as research participants, and measure their lying behavior in the real-life organizations. However, due to the ethical concerns of lying effect (e.g., *lying may cause disturbance to the teamwork and damage member's credibility*) and human rights of the participants (e.g., *the roles of liars and victims cannot be manipulated without breaching the confidentiality, and negative impact on individual's well-beings is probable*), a quasi-experiment methodological approach was adopted in the current research, helping researchers to observe the impact of self-awareness on lying behavior. In order to improve the ecological validity of research findings, we referred to other studies who carried out the same methodology (Celse & Chang, 2017; Gino *et al.*, 2009; Shalvi *et al.*, 2011), and the manipulation tactics of prior studies were learnt and applied to the current research (*we are cautious of the constraint of quasi-experiment and will discuss its implication at a later stage*). Specifically, in order to examine the research hypotheses, we arranged *dice-under-cup* games in the laboratory, in which participants played dice games in *scenario-based-conditions* (SBC; Sansone *et al.*, 2004). SBC offered ample opportunity to scrutinize the behavior in a quasi-experiment setting whilst removing ethical issues (Celse *et al.*, 2016; Sansone *et al.*, 2004). As the research aimed to analyze the *awareness-lying relationship*, SBC was thus adopted and two conditions are crafted, i.e., *Mirror Condition* (MC) vs. *Baseline Condition* (BC). Research ethical practices were applied (*inc.* research invitation letter, consent form, and post-experiment briefing sheet) in line with the approval of the institutional ethics committee.

Sample

165 employees from public- and private-organizations in Dijon, France were recruited as research participants, and their participation was voluntary-based. These participants were also learners registered

on business programs at a local educational institute, where authors were employed. Participants were randomly assigned to the pre-set conditions in the research. The mean ages and gender ratio of participants in each condition are shown in Table 1.

<Insert Table1 About Here>

Experimental procedure

When participants arrived at the laboratory (research site), they were randomly assigned to individual cubicles. Each person was assigned to either baseline condition or mirror condition, that is, one person in one condition. Participants then received instruction sheets, subject to their assigned conditions (details of condition manipulation to be clarified later). Within each condition, apart from the given instruction sheets, all participants received the same information from their cubicle monitors and speakers. This design had two purposes: i). it ensured that everyone in the same condition received the same information; and, ii). the consistent audio and visual-based information helped to enhance the efficacy of instructions, facilitating participants to play dice games (*c.f.* Gino *et al.*, 2009; Shu *et al.*, 2012).

Next, all participants were told that they would participate in a series of dice games and their performance were recorded for analysis and rewards, i.e., higher dice readings equate to more monetary rewards (#1 = €1; #2 = €2 ... #6 = €6). A research administrator was present to provide general support to the participants.

During the instruction stage, five participants were randomly selected to play dice games and read aloud their dice readings. This arrangement not only helped participants to familiarize themselves with dice games, but also ensured participants that their dice were normal, genuine, and there was no cheating-device embedded. After the instruction, dice games commenced. Participants were then instructed to shake the dice in the cup and recorded the readings on the answer sheet. At this stage, participants only understood that they were expected to play dice games, but they did not know how many rounds of games they played totally. Actually, the first two rounds of dice games were for the purpose of exercises only, and the third round of game was used for data analysis. The rationale behind the 3-round design was to reduce the bias of end-game effects on analysis (Chang, 2012).

When the third round of dice games was completed, participants were told that their dice games had finished. They immediately returned their equipment (dice and cup) to the administrator, so that no one could know the outcome of the third round of games. Participants were then requested to leave the laboratory and enter to the room nearby, and they were issued a copy of the briefing sheet, revealing the true purpose of the research. Participants were also paid in cash (based on their self-reported dice readings) and appreciated for their participation.

After the payment was made, we issued participants anonymous questionnaires to understand the confession of lying. As participants' reported outcome were already collected, they could not change their responses and this procedure helped to reduce the confession-related bias in analysis (Gino *et al.*, 2009; Shu *et al.*, 2012). Anonymous surveys also provide participants a confession opportunity without anxiety, as people may not confess to lying if they believe there is a chance of getting caught (Peer *et al.*, 2014).

Manipulation of the Scenarios

Two scenarios were designed in line with SBC (Sansone *et al.*, 2004) and details follow:

Scenario One: To activate the self-awareness in the Mirror Condition (MC), we adopted a technique invented by Carver and Scheier (1978), in which participants were asked to stand in front of the one-way wall mirror, i.e., participants can see themselves in the mirror, and this self-reflexive capacity of an individual facing a mirror can form a strong self-image and develop a sense of self-awareness. One-way wall mirror allows researchers to observe participants' behavior without participants' awareness (Duval & Wicklund, 1972; Wicklund, 1975). The technique and its variants are popular in cognate studies (*cf.* Shu *et al.*, 2012; Shalvi *et al.*, 2015), and scholars claim that self-awareness is activated through facing one's reflection in the mirror, leading to more honest behaviors (Rosenbaum *et al.*, 2014). Interestingly, scholars also criticize that participants are cautious of wall mirror, as participants may feel someone oversees them from the other side of mirror, which may lead to behavioral changes and cause biases in analysis (Sentryz & Bushman, 1998). To overcome this drawback, we replaced *one-way wall mirror* by *tripod mirror*, i.e., the mirror was mounted onto a tripod base. As it removed the concern of overseeing,

participants shall feel more secured and confident, so their decision-making of reporting dice readings would be more genuine.

Scenario Two: Self-awareness was not activated in the Baseline Condition (BC). BC acted as a control group, comparing the potential influence of self-awareness on lying behavior between MC and BC. Namely, if lying occurs more often (or less often) in MC, BC helps examine the variance of lying behavior between two scenarios.

Manipulation check. The condition-manipulation and dice games were arranged separately to avoid causality bias (Gino *et al.*, 2009). We also examined whether participants connected the two through a post-experiment survey. Results showed that no participant made such connection, indicating the chance of causal bias was slim and the manipulation was successful.

Probability of lying

In both MC and BC conditions, participants played *dice-under-cup* games, i.e., a dice was placed inside an opaque cup and there was a peephole lid on the top. This design allowed participants to see dice readings through the peephole and only the participants could see the actual readings. Celse and Chang (2017) indicate that such design incurs a probability of lying, as participants may lie (e.g., reporting higher readings to gain more earnings) or not lie (e.g., reporting lower readings to gain less earnings, if the actual readings are indeed lower). As a dice has six sides (from #1 to #6) and the probability of reporting a specific reading is one in six (hence 16.67%), reporting a specific reading repeatedly may imply lying. Namely, if a person reports #6 repeatedly, and the appearance of #6 is higher than the average probability 16.67%, this person may have lied.

Findings

We first inspected any signs of lying by analyzing the distribution of reported outcomes (dice readings) in both conditions (Figure 1). The probability of reporting #6 was 29.91% in BC and 28.95% in MC, the probability of reporting #5 was 31.46% in BC and 25.00% in MC, and the probability of reporting #4 was 16.85% in BC and 18.42% in MC. All six figures were higher than the average probability (16.67%), implying signs of lying. Specifically, lower dice numbers (#1 & #2) were reported

less frequently (less than average probability), whereas higher dice numbers (#5 & #6) were reported more frequently (more than average probability). Lower numbers in BC and MC appeared consistently less than the average probability (16.67%), including: #1 (BC 7.87%, MC 5.26%) and #2 (BC 3.37%, MC 3.95%). Conversely, higher numbers in both conditions appeared consistently more than the average probability (16.67%), including: #5 (BC 31.46%, MC 25.00%) and #6 (BC 29.21%, MC 28.95%).

<Insert Figure 1 About Here>

The aforementioned statistical figures could be interpreted by two possibilities: i). participants lied their dice readings; and, ii). Participants indeed rolled out bigger dice numbers. To examine these possibilities, we analyzed the distribution of reported readings in both conditions. We first found significant differences across #1 to #6 in BC (Kolmogorov–Smirnov, $D = 0.387$, $p = 0.001$, $p < 0.01$), indicating that the distribution of the reported readings deviated from uniform distribution (note: uniform distribution is based on a principle that the readings from #1 to #6 are equally distributed). We also found significant differences across #1 to #6 in MC (Kolmogorov–Smirnov, $D = 0.430$, $p = 0.001$, $p < 0.01$). These findings clearly indicated that participants in BC and MC both lied; namely, participants lied dice readings.

About Hypothesis One (H1a & H1b)

In theory, the average of reported readings in a condition should be 3.50. This is because a dice has six readings (from 1 to 6), the sum of readings ($1+2+3+4+5+6=21$) is 21, and hence the average ($21 / 6$) should be 3.50. Yet, the average was 4.48 in BC and 4.40 in MC. Both average values were higher than the theoretical average (Gap for BC = 0.98; Gap for MC = 0.90), and there was no difference between BC and MC ($t(10) = 0.01$, *n.s.*; *Levene's F* = .135, $p = .721$). These findings implied that participants in both conditions lied their dice readings.

We compared the distribution of reported readings and found deviances in BC ($\chi^2 = 37.245$, $p < .001$) and MC ($\chi^2 = 23.631$, $p < .001$). In terms of bigger numbers, participants in BC showed a greater deviance (#5 = 31.46%, #6 = 29.21%) than participants in MC (#5 = 25.00%, #6 = 29.95%). In terms of smaller numbers, participants in BC (#1 = 7.87%, #2 = 3.37%) and MC (#1 = 5.26%, #2 = 3.95%) both

showed deviance. The reported readings were different from the equal distribution, indicating that participants of both conditions lied their readings.

To analyze the actual amount of money given to the participants at the end of dice games, we carefully compared the distribution of payoffs in both conditions. Results showed that BC's distribution was not different from MC's distribution ($\chi^2 = 2.568$, $p = .763$), and that there was no difference (payoffs) between BC and MC (Mann-Whitney $U = 3237$, $p = 0.626$).

Altogether, the statistical analysis affirmed that participants in both conditions lied their dice readings. Self-awareness was activated in MC, but it did not cause any lying difference between MC and BC. Namely, self-awareness did not decrease or increase lying behavior between conditions. Thus, the H1a was declined and H1b was supported.

About Hypothesis Two (H2)

As per confession of lying, 12.36% of the participants in BC confessed to lying, so did 18.42% of the participants in MC. There was no difference between two conditions ($\chi^2 = 1.172$, $p = .279$), indicating that participants of both conditions confessed to lying.

We then examined whether self-awareness was related to the confession of lying. A binary logit regression analysis was applied, in which we named the dependent variable as *Lie* and we set its value 1 for lying, i.e., *Lie* = 1 when participants confessed to lying. We named *Others are lying* as the first independent variable and we set its value 1 for *Yes*, i.e., *Others are lying* = 1 when participants believed that other participants were lying. We named *Self-awareness* as the second independent variable and we set its value 1 for *activated*, i.e., *Self-awareness* = 1 when participants were in Mirror Condition and their self-awareness was activated via mirror setting. We named *Age* as the third independent variable (note. we did not set value for age, due to its parametric nature). As it is shown in Table 2, both self-awareness (coefficients = 0.312) and age (coefficients = 0.007) did not predict *Lie* ($p = 0.306$). Only *Others are lying* positively predicted *Lie* (coefficients = 0.715, $p < .001$).

<Insert Tables 2, 3 and 4 About Here>

Following the findings of logit regression analysis, we conducted further analyses with two revisions. We first replaced *Self-awareness* by *Gender* and we set its value 1 for female, i.e., *Gender* = 1 when a participant was female. Second, we adopted single sample in the logit regression model, as focusing on single sample (either BC or MC) could help researchers to scrutinize the relationships of variables within the sample more closely. As it is shown in Table 3 (Baseline Condition), both gender (coefficients = 0.305) and age (coefficients = 0.006) did not predict *Lie*, and only *Others are lying* positively predicted *Lie* (coefficients = 0.866, $p < .001$). As it is shown in Table 4 (Mirror Condition), both gender (coefficients = -0.223) and age (coefficients = -0.274) did not predict *Lie*, and only *Others are lying* positively predicted *Lie* (coefficients = 0.609, $p < .01$).

Our statistical findings were meaningful in two ways. First, participants in both conditions confessed to lying. Second, only *Others are lying* was significantly and positively correlated to *Lie*. *Self-awareness*, *gender* and *age* were not correlated to *Lie*. That is, participants lied more when they believed other participants were lying. To sum, as self-awareness did not decrease or increase lying behavior (*confirmed by the first hypothesis*) and self-awareness was not related to the confession of lying (*confirmed in the binary logit regression analysis*), we could conclude that self-awareness did not encourage participants to confess to lying, or not to confess to lying. As such, the second hypothesis should be supported.

Discussion

Employee's lying behavior affects colleagues, teamwork and the workplace, and its consequence on organizational interests and overall performance is severe (Celse *et al.*, 2016; Choshen-Hillel, *et al.*, 2020; Mahmood *et al.*, 2021). To fight against the lying behavior, scholars have argued that self-awareness makes people more conscious of their own behavior, which in turn reduces their lying tendency (Wicklund & Duval, 1971). This view inspires later studies and praises the merits of self-awareness in lying intervention (Cappelen *et al.*, 2013; Fischbacher & Föllmi-Heusi, 2013). Yet, based on a different literature (Lewis *et al.*, 2012; Marzar *et al.*, 2008; Peer *et al.*, 2014; Rosenbaum *et al.*, 2014), we have learnt that self-awareness may not necessarily reduce lying. In the current research, we actually discover that self-awareness did not refrain people from lying, and that self-awareness did not encourage the

confession of lying. These research findings have brought new insights into the lying-intervention literature, challenging the existing knowledge of self-awareness. Implications on knowledge advancement and managerial practices are clarified below.

Self-awareness and lying intervention

As discussed in the literature review, self-awareness plays a subtle role in lying intervention, and a common explanation is: people may evaluate their behavior along with their own standards, such as self-values and moral sense, before they engage in such behavior (*Self-awareness theory*: Wicklund & Duval, 1971). In accordance with the personal standards, people become more conscious of their decision-making process and make extra effort to main their positive self-concept, for instance, transgressing less rules (Beaman *et al.*, 1979; Iteboje & Chang, 2021) and eating healthier (Sentyrz & Bushman, 1998). Having said this, however, the relationship between self-awareness and lying seems not straightforward. Although self-awareness is related to lying behavior, individual differences affects the association between self-awareness and lying, such as *personal characteristics* (Cappelen *et al.*, 2013), *gender effect* (Childs, 2012), *emotion* (Celse *et al.*, 2016) and *self-perception* (Celse & Chang, 2017). Similarly, we have found that self-awareness does not reduce lying behavior or encourage the confession of lying. Our research findings have advanced the lying literature in three specific ways:

To begin with, self-awareness is subjective in nature and affected by social activities (Campbell, 1964) so individuals may interpret it differently; for instance, one may have a strong sense of self-awareness, whereas another may have no particular feeling about self-awareness. What one thinks acceptable, important and valuable may be interpreted as unacceptable, unimportant and worthless by another. Take our research for instance, only 18.42% of the participants in MC confessed to lying. Although we could not confirm that the remaining 81.58% population did not lie, at least, we did know that not all liars in MC confessed to lying. Therefore, we can argue that, when individual difference exists, the influence of self-awareness on lying intervention becomes inconsistent.

Next, we would like to propose three perspectives to explain an intriguing phenomenon, i.e., participants lied more when they believed other participants were lying. These perspectives are: i).

Irrelevance of self-awareness: This phenomenon seems irrelevant to self-awareness, as participants from MC and BC showed the same lying pattern; participants simply lied because they subjectively believed that other participants were lying too; ii). *Assumed consensus*: As participants realize that there are many participants in the dice games, they may assume that other participants lie bigger dice readings *in exchange for* more gains. Gino, Ayal and Ariely (2009) indicate that, because of the influence of reference group (such as other participants in the same experiment), a participant may assume that other participants are competing against himself/herself and other participants may lie to maximize their gains; therefore, he/she should also lie to maximize his/her gains; and, iii). *Legitimization*: People may use others' lying behavior to compensate their guilty feeling for their lies (Shalvi *et al*, 2015). People tend to legitimize their own lying behavior via references (Wells, 2010): for instance, if other people lie, I can lie too, as everyone lies. Therefore, we can argue that the influence of self-awareness on lying intervention is not salient, *as per* the three perspectives aforementioned.

In addition, scholars propose that self-awareness is embedded within morality, and that self-focused attention guides people to examine their behavior with their own moral standards (Wicklund, 1975; Wicklund & Duval, 1971). Following this logic, people may feel uncomfortable if these standards are not met. Nevertheless, we suggest that self-awareness should be detached from morality. It is evident that participants in both conditions lied their dice readings and confessed to lying. Participants were clearly aware that they lied bigger numbers *in exchange for* higher gains (*discussed in data analysis*). If Wicklund's view were true, participants would not lie, as their morality did not allow them to lie. If Wicklund's view were feasible, participants would not confess to lying, as confession would be regarded as infamous and immoral. Therefore, our proposition is: lying behavior is not always related to individual's moral standards. People lie simply because they want to lie and they know they are lying. As such, we conclude that self-awareness has limited influence in lying intervention.

Self-awareness and managerial implications

Employee's lying behavior has drawn public attention (Buehl *et al.*, 2019), so has the current research. To support the managers and their lying-intervention strategies, we are keen to know what could

be done to reduce the occurrence of lying behavior in the workplace. Based on the research findings, we have learnt that people are more likely to lie in a lying-rampant environment (*confirmed in BC & MC*). We therefore recommend managers with three strategies of lying-intervention. These are:

First, managers shall promote integrity through managerial policies and appraisals, because it helps employees to appreciate what types of behavior are encouraged or prohibited (Dwyer & Hopwood, 2010); Second, managers shall implement strict internal processes to remove any temptations that encourage staff to lie or commit fraud (ACFE, 2017). For example, managers should not allow the same employee to handle both the recordings and processings of transactions. Separation of the duties would be a sensible business precaution; Third, managers shall facilitate an integrity and fair working culture, as fairness is the top prerequisite for creating a good place to work (Seifert *et al.*, 2016). In practice, managers shall ensure that both tasks and duties are fairly allocated, performance bonus schemes are fairly implemented, and career opportunities are fairly distributed to the employees. Where applicable, AI-driven management strategies may be adopted to facilitate the efficiency and efficacy of employee management policies (Chang, 2020), allowing managers to monitor the emergence of unfairness more easily. In our experience as HR consultants, when a culture of fairness is created in the workplace, employees are more likely to respond to their organizations, managers and colleagues truthfully.

In addition, although self-awareness does not necessarily restrain lying, we advise managers not to abandon their awareness-driven interventions immediately. Our proposition is: self-awareness is still crucial to the behavioural decision-making process, as it helps people to evaluate the merits and risks involved with the lying behavior (DePaulo & Kashy, 1998). From a point of lying prevention, self-awareness still has merits and should be retained. Inspired by the studies of work ethics (Osibanjo *et al.*, 2015; Smola & Sutton, 2002), we suggest managers to enhance the function of self-awareness via ethics enhancement. One way to practice this is: managers may incorporate self-awareness into the work ethics and schedule regular workshops to remind employees of the importance of ethics. When employees are regularly exposed to the work ethics and kept ethics in mind, the intention of lying shall decrease.

Limitations and suggestions

Every research has its limit and there is no exception here. We did not measure the magnitude of activation, so we did not know how much self-awareness was indeed activated in the scenario-based conditions. If such data were available, the impact of self-awareness on lying behavior would be quantifiable. As scholars have mixed views about the measurement of self-awareness (e.g., reliability & ethical concerns), future studies may consider adopting Govern and Marsch (2001)'s situational self-awareness scale to continue this line of research.

We acknowledge the difference between experimental research and real-life organizational settings, and we are cautious about the implication of research findings and relevant issues of applicability. However, due to the ethical concerns and participants' human right, we had to arrange scenario-based conditions (Sansone *et al.*, 2004) to analyze lying behavior. One may claim that lying in such conditions does not generate real harm, so participants may feel less guilty/stressed in lying and thus engage in more lying behavior. We appreciate this claim and understand its potential bias in analysis; yet, our research aims to focus on lying behavior rather than severity of lying. We have prudently examined the lying behavior in different conditions, and research findings have brought new insights to the knowledge of lying mechanism. Future studies may consider the severity of lying in the research design and analyze how severity is related to the lying occurrence.

Although scholars have implied the potential influence of internal values and standards on behavior (Wicklund, 1975; Wicklund & Duval, 1971), we did not investigate any values and standards of the research participants, so we could not judge whether the claimed influence exists nor the mechanism of such influence. We therefore advise future studies to consider this important line of research. Moreover, we did not measure the motivation of lying but if we do, the measurement should be conducted in a qualitative manner. This is because lies can be considered from the perspectives of the liar, the lied-to, and the relationships that link the two; very often, people lie in various ways depending on their perception of the closeness, importance and level of intimacy of relationships (DePaulo & Kashy, 1998). Perhaps a more qualitative research approach may help observe the relationship across liar, the lied-to and bystander more closely.

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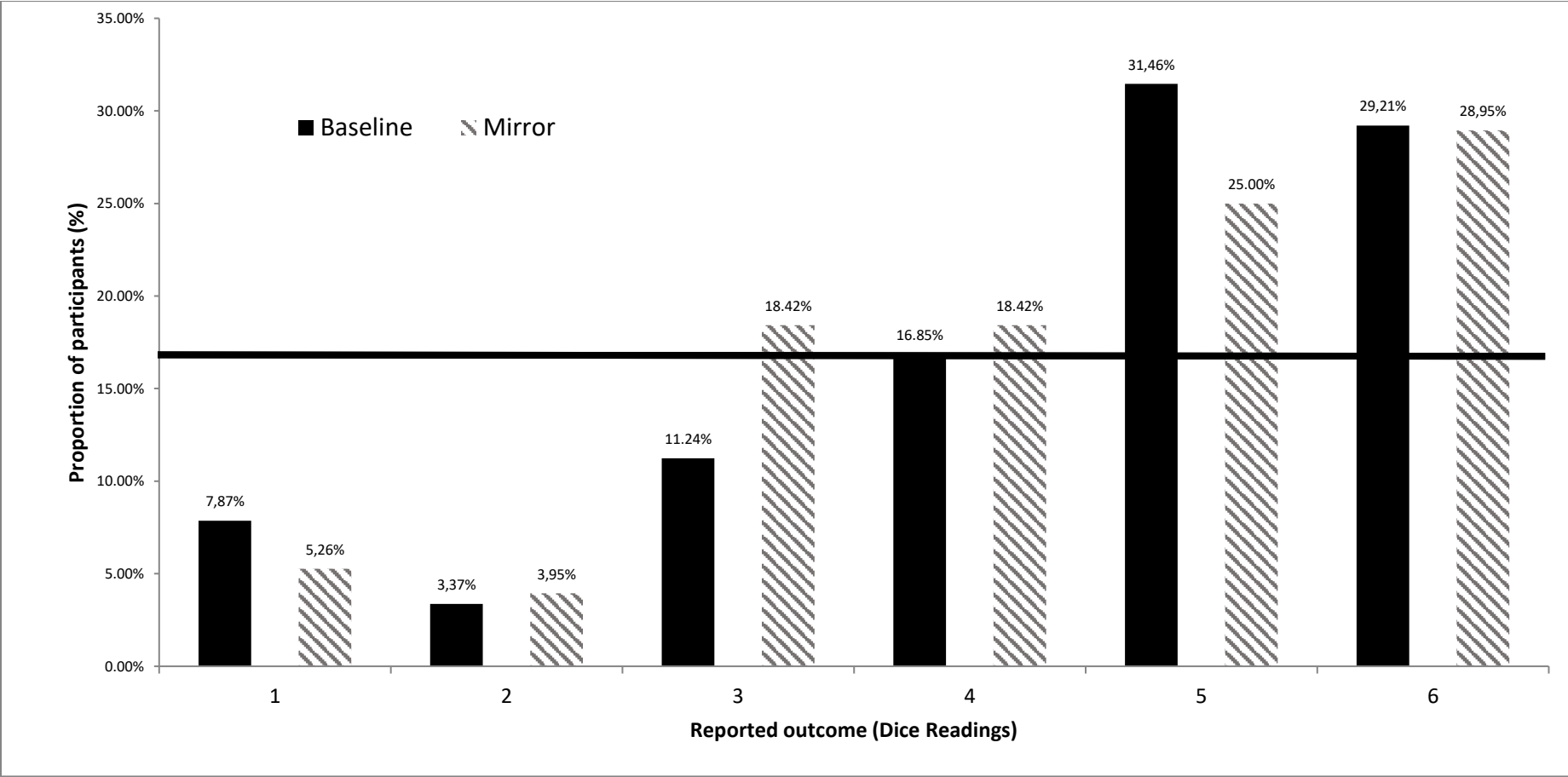
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Figure 1: Distribution of reported outcome (Dice readings)



Note. The horizontal bold line represents the average distribution (probability = 16.67%).

Table 1: Profile of participants

	Mirror Condition (MC)	Baseline Condition (BC)	(Total)
Sample <i>n</i>	76	89	165
Age (years)			
Means	20.146	20.559	20.356
Std. Dev	0.691	0.796	0.775
Gender			
Females	43	50	93
Males	33	39	72
Female Ratio (%)	56.579%	56.180%	56.364%

Table 2: Summary of Binary Logit Regression

Logit Regression

Nb.Obs: 165

Adj-R Squared: 0.1401

Dependent Variable: Lie (1 = confessed to lying)

Independent variables	Coefficients (std. errors)
Others are lying (1 = Yes)	0.715 (0.197)***
Self-awareness (1 = Activated)	0.312 (0.493)
Age	0.007 (0.332)
(constant)	- 5.786 (6.834)

Note. *. p <.001

Table 3: Summary of Binary Logit Regression (Baseline Condition)

Logit Regression

Nb.Obs: 84†

Adj-R Squared: 0.1778

Dependent Variable: Lie (1 = confessed to lying)

Independent variables	Coefficients (std. errors)
Others are lying (1 = Yes)	0.866 (0.324)***
Gender (1 = Female)	0.305 (0.471)
Age	0.006 (0.726)
(constant)	- 12.798 (10.044)

Note. *. $p < .001$.

†. Due to the missing values in the data sheet, this figure is different from the total sample size ($n = 89$).

Table 4: Summary of Binary Logit Regression (Mirror Condition)

Logit Regression

Nb.Obs: 75†

Adj-R Squared: 0.1166

Dependent Variable: Lie (1 = confessed to lying)

Independent variables	Coefficients (std. errors)
Others are lying (1 = Yes)	0.609 (0.264)**
Gender (1 = Female)	-0.223 (0.656)
Age	-0.274 (0.463)
(constant)	0.922 (9.278)

Note. *. $p < .01$

†. Due to the missing values in the data sheet, this figure is different from the total sample size ($n = 76$).