

Unintended Consequences of Budget  
Participation and Performance Misreporting:  
An Experimental Study

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# Unintended Consequences of Budget Participation and Performance Misreporting: An Experimental Study

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## **ABSTRACT**

Clarifying mechanisms of accounting fraud to achieve performance targets is an important issue in accounting research. Especially, examining the impact of a set of goal-setting processes on both performance and its misreporting behavior is a major topic.

To examine this impact, we conducted an online experiment using Amazon Mechanical Turk and oTree in which participants were asked to perform a real effort task and a goal-reporting behavior (N = 378). We compared participants' performance and reporting behavior for conditions with and without participation in the goal-setting process.

Our results revealed an unintended consequence—dishonest performance reporting was more frequent for the budgetary participation condition than the no participation condition. This result was explained by both *the moral disengagement theory*, in which task sincerity is consistent with reporting sincerity, and the change in the relationships among participation, task performance, and reporting behavior. Our study sheds light on a novel mechanism of accounting fraud to achieve performance targets.

**Keywords:** online experiment; participation; real effort task; performance misreporting; moral disengagement theory

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## I. INTRODUCTION

Clarifying mechanisms of accounting fraud is one of the most important issues in accounting research (e.g., Amiram et al. 2018; Beasley, Hermanson, Carcello, and Neal 2010; Hogan, Rezaee, Riley Jr, and Velury 2008; Trompeter, Carpenter, Desai, Jones, and Riley Jr 2013; Trompeter, Carpenter, Jones, and Riley Jr 2013). Hope and Fraser (2003) point out, for example, that recent accounting scandals result from senior executives and operating managers committing to overly aggressive targets and then fudging the number to meet them. For example, at the Toshiba Corporation, a global manufacturing company, strong pressure from the top management to business unit managers in regular monthly meetings to achieve the budget became a major cause of accounting fraud (Toshiba 2015). Business unit managers influence these measures without changing their level of effort, sometimes by exercising discretionary control over accounting performance measures (e.g., Courty and Marschke 2004; Guidry, Leone, and Rock 1999; Indjejikian and Matejka 2009). Managers are motivated to manipulate performance because many firms have incentive systems that reward them for high performance (e.g., Jiambalvo 2019; Maas & Van Rinsum 2013; Merchant and Van der Stede 2017). In addition, to achieve the company's financial targets, the pressure to achieve the budget is likely to increase from shareholders and analysts to CEOs to CFOs to managers (e.g., Albrecht, Holland,

Malagueño, Dolan, and Tzafrir 2015). Thus, it has been pointed out that performance manipulation by managers to achieve the budget leads to accounting fraud. Therefore, it is an urgent issue to clarify the factors related to managers' performance manipulation behavior.

Many previous studies have shown the positive effects of budgetary participation. For example, budgetary participation can have performance-enhancing effects (Libby 1999, 2001; Wentzel 2002). However, there is still a dearth of research that extends this to performance reporting behavior, and that captures the three-way relationship between budget participation, task performance, and reporting behavior. In addition, previous studies have discussed budget setting, focusing on issues such as the difficulty and type of goals (e.g., Schweitzer, Ordóñez, and Douma 2004; Welsh and Ordóñez 2014), but in addition to that, examining the impact of a set of goal-setting processes on both performance and its misreporting behavior is a major topic.

To examine the impact, we adopted an experimental approach. Compared to empirical analyses conducted in the field, experimental research offers tighter controls on goal-setting processes. By carefully selecting relevant parameters, we can directly compare actual behavior under some settings—for further discussions on experimental methodology, see, for example, Bloomfield, Nelson, and Soltes (2016), Camerer (2003), Libby, Bloomfield, and Nelson (2002), Luft and Shields (2009).

Specifically, we conducted an online experiment using Amazon Mechanical Turk (MTurk) and oTree (Chen, Schonger, and Wickens 2016), in which participants were asked to perform a real effort task and a goal-reporting behavior (N = 378). To compare the performance and reporting behavior of participants in conditions with and without participation in the goal-setting process, we employed a 2 × 1 between-participant design to manipulate those who set the performance targets.

Comparing the performance and reporting behavior in conditions with and without participation in the goal-setting process resulted in the following four findings. First, budgetary participation had a positive effect on task performance. Second, dishonest performance reporting was more frequent in the budgetary participation condition than in the no participation condition. While the first finding replicated the results of previous research, the second was an unintended consequence that contradicted previous research. Third, the overall results between task performance and reporting behavior were consistent with the moral disengagement theory—task sincerity was consistent with reporting sincerity. Fourth, when task performance was moderate (i.e., task efforts were neither sincere nor insincere), the relationship between the task and reporting became weaker, and budget participation affected participants' sense of responsibility, which in turn increased dishonest reporting. In particular, the results in the third and fourth findings explain the unintended consequence of the second finding.

This research produced three key contributions. First, it contributes to both budget control research and accounting fraud research. Our study examined the impact of a set of goal-setting processes on both performance and its misreporting behavior and sheds light on a new mechanism of accounting fraud to achieve performance targets, which previous studies have overlooked to capture. In this sense, this study integrated budget control research, which aims to improve employee performance, and accounting fraud research, which aims to prevent misreporting in advance. Therefore, our study brings a new perspective to both fields of literature.

Second, it contributes to the explanatory principles of human ethical behavior in behavioral economics. Using discussions of moral disengagement theory (e.g., Bandura 1986; Cojoc and Stoian 2014; Moore 2015; Rosenbaum, Billinger, and Stieglitz 2014; Shu, Gino, and Bazerman 2011; Vincent, Emich, and Goncalo 2013) and moral cleansing theory (e.g., Blanken, van de Ven, and Zeelenberg, 2015; Chowdhury, Kim, and Kim 2021; Cojoc and Stoian 2014; Gneezy, Imas, and Madarász 2014; Lasarov and Hoffmann 2020; Ploner and Regner 2013; Schurr and Ritov 2016; West and Zhong 2015), which have attracted attention as psychological mechanisms of multiple ethical behaviors, we explained the relationship between task performance and reporting behavior. We found that these theories were related in some domains and not in others; and, where they were not related, budget participation had

strong negative effects on ethical reporting behavior. Thus, our study brings a new perspective to this literature.

Third, it contributes to the possibility of online experiments in accounting research. In this study, an online experiment using MTurk was used to successfully recruit participants consistent with the research objectives (e.g., Libby et al. 2002), and we used a real effort task (e.g., Akinyele, Arnold, and Sutton 2020; Gill and Prowse 2012; Gill, Prowse, and Vlassopoulos 2013) to measure participants' task performance. Therefore, this study provides a new perspective for future experimental research in accounting.

The remainder of this paper is organized as follows. Section II presents our hypotheses. In Section III, we explain the experimental design employed to test our hypotheses. Section IV describes our empirical results. Section V discusses the interpretation of our results and Section VI concludes the paper.

## **II. HYPOTHESES**

We examine the impact of budget participation on task performance and misreporting behavior. In particular, we focus on who is the final decision-maker of the budget goal, based on

Schweitzer et al. (2004). In other words, we compare the case where the worker themselves is the final decision-maker of the goal and the case where others (e.g., the boss) are the final decision-makers of the goal, and examine what psychological factors that come into play to influence task performance and reporting behavior.

First, we formulate a hypothesis about the relationship between budget participation and performance. Budgets can be a means of motivating workers to achieve organizational goals. To do so, budgetary goals need to be accepted by workers and internalized as their own goals (e.g., Otley 1987, 1999). For workers to accept budgetary goals, it is effective to involve them in the budgetary goal-setting process. According to a number of studies, budgetary participation enhances actual performance through several psychological factors (Libby 1999, 2001; Wenzel 2002). For example, Libby (1999, 2001) shows in experiments that workers' budgetary participation improves their performance by increasing their perception of procedural fairness. Furthermore, Wenzel (2002) shows that workers' budgetary participation mediates procedural fairness and distributive justice to increase their commitment to goals, which in turn improves their performance. Therefore, we derive the following hypothesis (H1) about the relationship between budgetary participation and performance.



**H1: *Budgetary participation and performance.* Budgetary participation has a positive effect on task performance.**

Second, we formulate a hypothesis about the relationship between budget participation and performance reporting behavior. Based on previous studies, workers' budgetary participation has a suppressive effect on deceptive performance reporting (e.g., Libby, Proell, and Smith 2019; Maclagan 1983; Schwartz 1968). When workers set their individual or group goals, they feel responsible for achieving the goals. Additionally, a sense of responsibility for goal achievement reminds workers of the connection between goals and decision outcomes (e.g., Maclagan 1983; Schwartz 1968), and thus has the effect of increasing worker honesty. For example, Libby et al. (2019) showed through an experiment that when budgeting included messages that held managers accountable, honest reporting increased compared to when it did not. Therefore, we derive the following hypothesis (H2) about the relationship between budget participation and performance reporting behavior.

**H2: *Budgetary participation and reporting.* Budgetary participation reduces misreporting of performance.**

Finally, we examine the three-way relationship between budgetary participation, task performance, and misreporting. First, we examine the relationship between task performance and misreporting. Numerous studies have shown that the psychological mechanisms of ethical judgments on multiple ethical behaviors may be explained by both moral disengagement theory and moral cleansing theory (e.g., Cojoc and Stoian 2014). Moral disengagement theory is a set of cognitive mechanisms that makes people's self-regulation for ethical behavior inactive (e.g., Bandura 1986; Moore, 2015). Shu et al. (2011) show that dishonest behavior itself increases the level of moral disengagement. Because people have internal moral standards and care about behaving ethically, they feel distress arising from cognitive dissonance after behaving dishonestly. Increased moral disengagement can serve to reduce such cognitive dissonance. Furthermore, several studies show that moral disengagement predicts future unethical behavior (e.g., Rosenbaum et al. 2014; Vincent et al. 2013). These suggest, in our study, that sincerity in task performance (the degree of effort) and sincerity in reporting will coincide. In other words, when performance is high (the distance to the goal is short), reporting is expected to be honest, and vice versa.

Moral cleansing theory is described as follows: ethical decisions are “substitutes” and past transgressions enhance one's conscience, leading to a desire to atone through compliance with social

norms, and vice versa (e.g., Blanken et al. 2015; Chowdhury et al. 2021; Cojoc and Stoian 2014; Gneezy et al. 2014; Lasarov and Hoffmann 2020; Ploner and Regner 2013; Schurr and Ritov 2016; West and Zhong 2015). Therefore, the moral cleansing hypothesis predicts, in our study, that the sincerity (degree of effort) in performance and the sincerity in reporting will be reversed. In other words, when performance is high (the distance to the goal is short), reporting is expected to be dishonest,<sup>1</sup> and vice versa. From both moral disengagement and moral cleansing theory, the following research question (RQ1) can be derived.

***RQ1: The relationship between performance and reporting. Will reporting be honest when performance is high?***

In addition, the relationship between these and budgetary participation has not been clarified by previous studies. Therefore, the following research question (RQ2) can be derived.

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<sup>1</sup> Previous research on the relationship between distance to goal and misreporting showed that when distance to the goal is short, dishonest reporting increases (e.g., Locke and Latham 2002). This finding is consistent with the moral cleansing theory.

***RQ2: Three-way relationship between budgetary participation, task performance, and misreporting.***

**How does budget participation affect the relationship between performance and misreporting?**

### **III. EXPERIMENTAL DESIGN**

#### **III-1 Platform of the Experiment**

We conducted an online experiment using the MTurk, a crowdsourcing platform, to gather participants, and oTree, a Python-based experimental software.

MTurk is a crowdsourcing market where a “requester” can ask a “worker” to perform various tasks. MTurk is currently attracting attention in social science research because it can be used in economic experiments to gather diverse participants easily and on a large scale (Arechar, Gächter, and Molleman 2018; Buhrmester, Kwang, and Gosling 2016; Paolacci, Chandler, and Ipeirotis 2010).

In accounting research, MTurk has attracted much attention, especially because it can be used to conduct experiments with working adults and participants with specific skills, rather than with student participants (e.g., Asay 2018; Asay, Elliott, and Rennekamp 2017; Asay and Hales 2018; Brink, Lee, and Pyzoha 2019; Buchheit, Doxey, and Stinson 2018; Elliott, Grant, and Hodge 2018; Koonce, Miller, and Winchel 2015; Rennekamp 2012). In our experiment, due to the nature of the scenario, we

recruited participants meeting the following conditions: they had to “live in the United States” and be full-time workers, i.e., have “full-time (35+ hours per week) work experience”.

oTree is experimental software for economic game experiments using Python and a web application framework called Django implemented by Python. Additionally, oTree was developed as an open-source program, and can be used to conduct real-time experiments on the web (Chen et al. 2016). We implemented a real effort task called a “slider task” using oTree. In our experiment, the participants were led from MTurk to oTree on the server and were made to perform the real effort task.III-2 Real Effort Task and Experimental Design.

### **III-2 Real Effort Task and Experimental Design**

In this experiment, we imposed a real effort task on participants and measured their task performance and employed a slider task, which is a standard in experimental economics (Gill and Prowse 2012). The slider task is a simple task in which the participant has to align a “slider” with the center of the range using a mouse or trackpad within a time limit (Figure 1). This has been used mainly in labor economics (e.g., Gill and Prowse 2012), misreporting behavior (e.g., Gill et al. 2013), and even in accounting research (Akinyele et al. 2020) as a task that can minimize the potential impact

on participants. Specifically, in our experiment, participants were asked to complete a task consisting of how many of a maximum of 40 sliders they could complete within 90 seconds. Then, under a fictitious scenario (see Appendix 1), the participant played the role of a “worker” in a certain company and performed a task to complete as many products as possible within a time limit (this is the “slider task”). In the experiment, a target was set for the “number of completed units” of the task, and the participant was given a bonus if the target was reached. Participants performed the task for four rounds in total, excluding the practice round.

*(Insert Figure 1 about here.)*

We employed a  $2 \times 1$  between-participant design to manipulate those who set the “number of completed units” goal in the experiment. Specifically, we set two conditions. The first condition was the “***budgetary participation condition***,” in which the worker participated in the goal-setting process. In this condition, the supervisor first suggested a certain range of the target number of pieces to be completed (e.g., 30–35 pieces), and then the worker decided the target number of pieces to be completed within that range (e.g., target is 33 pieces). The second was the “***no budgetary***

*participation condition*,” in which the worker could not participate in the goal-setting process. In this condition, the supervisor unilaterally decided the target number of pieces to be completed (e.g., 35 pieces), and the worker had no involvement in it.<sup>2</sup>

The experiment consisted of three stages: (1) goal-setting, (2) slider task, and (3) reporting behavior. In the goal-setting stage, participants themselves set the target values for the number of completed units in the budgetary participation condition,<sup>3</sup> and their supervisors set the target values in the no participation condition.<sup>4</sup> Second, in the slider task stage, participants performed a slider task. In the experiment, we tested our hypothesis by comparing task performance across conditions. Third, in

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<sup>2</sup> In terms of the budgeting process in a real company, the budgetary participation condition corresponds to the bottom-up type budgeting process, and the no budgetary participation condition corresponds to the top-down type budgeting process. The bottom-up type is a process in which budget targets are set by each department and finally approved by the top management. In contrast, the top-down type is a process in which the top management decides on specific policies and sets goals for each department. In this connection, Heinle, Ross, and Saouma (2014) complement the ongoing empirical discussion surrounding participative budgeting by comparing its economic merits relative to a top-down budgeting alternative. Therefore, our experimental design comparing both budgeting conditions is not unrealistic.

<sup>3</sup> To determine the “range” of the target number of completed items in the budgetary participation condition, we conducted a pre-experiment with only a slider task. To observe misreporting behavior when the target was not met, we set the range at a level where 80–90% of the participants did not meet the target (specifically, 30–35 pieces) based on the distribution of the data of the number of completed pieces in the pre-experiment. This target difficulty setting relies on goal-setting theory (e.g., Latham and Seijts 1999; Schweitzer et al. 2004; Welsh and Ordóñez 2014), which states that goals with specific and difficult levels enhance task performance.

<sup>4</sup> We set the goals of the no budgetary participation condition to match those of the participation condition by the following procedure. The experimental sessions in the participation condition were conducted first, and we observed the data distribution of the goals set by the participants. In the participation condition, the mean number of goals set by the participants was 31.57 (SD = 2.54). Therefore, referring to these data, we set the number of goals in the no budgetary participation condition as 32.

the reporting stage, participants reported the number of completed units to their supervisor. Then, according to the self-reported number of pieces, it was judged whether the target was achieved. If the actual number of pieces completed did not meet the target, the participant could still make a fraudulent report. For example, a participant could report 35 pieces even when the actual number of pieces completed was 25. We measured how much the participant misreported, especially when the actual number of completed pieces was below the target. Note that in the experiment, we assumed that the cost of misreporting was zero, following previous studies (e.g., Nichol 2019).

Based on the hypotheses explained in the previous section, we asked the participants in the post-questionnaire after the experiment about the measures of procedural justice (e.g., Libby 1999; Tyler and Lind 1992), sense of responsibility (e.g., Libby et al. 2019), goal commitment (e.g., Latham and Steele 1983; Wenzel 2002), prevention focus (e.g., Higgins 1997; Welsh, Bush, Thiel, and Bonner 2019), intrinsic motivation (e.g., Ryan 1982), and trust in superiors (e.g., Hartmann and Slapnicar 2009). These were considered as mediating variables that could possibly explain the differences between the conditions, relying on previous studies (post-questionnaire items for the mediating variables are shown in Appendix 2).



Based on the above experimental design, we conducted an online experiment using MTurk and oTree in December 2020.<sup>5</sup> The mean age of the participants was 39.78 years [standard deviation (SD) = 10.78] and females represented 42 percent. Each participant was randomly assigned to one of the conditions and participated only in the assigned condition.<sup>6</sup> The final number of participants in the experiment was 378 (participation condition, 192; and no participation condition, 186).<sup>7</sup> In the experiment, the participants reviewed the instructions and answered the comprehension test of the experiment. After that, the participants played the game while assuming the role of workers according to the scenario. After completing the game, the participants answered questions about the mediating variables and responded to a post-questionnaire about the demographic data. The average duration of the experiment was 1,379 seconds (including instruction and answering the post-questionnaire). The

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<sup>5</sup> The experiments in this study were approved by the IRB of Doshisha University, Japan.

<sup>6</sup> Arechar et al. (2018) discuss that re-takers may seriously compromise the data for online sessions. Accordingly detecting them requires specific measures. Within a session, we prevented duplicate participation by logging the user's IP address and blocking users that had already been connected to the experimental server. Between sessions, Arechar et al. (2018) used UniqueTurker (<http://uniqueturker.myleott.com>), a third-party software to prevent workers who had already participated in a specific HIT (Human Intelligence Tasks) from being invited for future sessions. We also used UniqueTurker to prevent re-takes between sessions. This method uses a unique MTurk identification number which is linked to each worker and that Amazon constantly monitors to avoid duplicate participation.

<sup>7</sup> The total sample for completing the oTree task was 405 (participation condition, 194; and no participation condition, 211). Since 27 participants were excluded due to incorrect answers to the comprehension check (participation condition, 2; and no participation condition, 25), the final sample size was 378 (participation condition, 192; and no participation condition, 186).

participants received a US\$2 show-up fee plus their earnings from the game. The average reward was US\$3.13 (participation condition, US\$3.28; and no participation condition, US\$2.98).

## IV. RESULTS

### IV-1. Summary Statistics

Because 378 participants each performed four rounds of slider tasks, there was a total of 1,512 rounds of observations. Among them, the sample that actually achieved the goal was 404 rounds (26.7%), and the sample that did not achieve the goal was 1,108 rounds (73.3%).

In the following, we analyze task performance in the full sample of 1,512 rounds. Additionally, we analyze misreporting behavior in 1,073 rounds, assuming a sample of 1,108 rounds in which the goal was not achieved and excluding 35 rounds in which the sample underreported (actual score > reported score)<sup>8</sup>.

Descriptive statistics for slider tasks are shown in Table 1. *Target score* shows the target number of the slider that the participant set in each round, *Reported score* shows the number of the slider that the participant reported to the boss in each round, and *Actual score* shows the actual

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<sup>8</sup> We were concerned with managers' performance manipulations that appeared to achieve their goals, even though they had not. Therefore, underreporting behavior when the goal was not achieved was excluded from the analysis.

completed number of the slider in each round of the subject. In the no budgetary participation condition, we set a target score as 32 in all rounds for the following two reasons: (1) the mean values of the *Target score* under the participation condition was 31.57 and (2) to control the *Target score* between two conditions.

The mean values of the *Reported score* were 28.70 (SD = 10.04) under the participation condition and 26.40 (SD = 10.44) under no participation condition; the corresponding values for the *Actual score* were 20.14 (SD = 14.45) and 19.43 (SD = 13.12)<sup>9</sup>.

*(Insert Table 1 about here.)*

Table 2 shows the misreporting tendencies. The variable *Misreporting likelihood* measures whether participants overstated their score. It is coded as 1 if they misreported, and 0 otherwise, and captures the proportion of participants who misreported their score. The mean values of *Misreporting likelihood* were 66.5 percent overall, 77.7 percent under the participation condition and 56.2 percent under no participation condition (Table 2 Panel A). *Dishonesty* measures the extent to which

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<sup>9</sup> The descriptive statistics of *Actual score* (performance) showed no effect of rounds.

participants overstated their performance, taking into account their actual scores. It is calculated as  $(\text{Reported score} - \text{Actual score}) / (40 - \text{Actual score})$  and represents the percentage of the available room for overstatement that is actually used. This dependent variable improves comparability with prior research in this area (e.g., Evans III, Hannan, Krishnan, and Moser 2001; Maas and van Rinsum 2013). The mean values of *Dishonesty* were 36.5 percent overall, 0.420 (SD = 0.326) under the participation condition and 0.314 (SD = 0.345) under no participation condition<sup>10</sup> (Table 2 Panel B).

*(Insert Table 2 about here.)*

Descriptive statistics for each of the mediator variables are shown in Table 3. The questionnaire items for each of the mediator variables are presented in Appendix 2.

*(Insert Table 3 about here.)*

## **IV-2. Hypothesis Tests**

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<sup>10</sup> The descriptive statistics of *Dishonesty* showed no effect of round.

## Tests of H1

Hypothesis H1 predicts that budgetary participation has a positive effect on task performance.

The t-test and Mann–Whitney U test showed no significant differences between the conditions ( $t = -1.01$ ,  $p = 0.310$ ; Table 4). However, indirect effects on performance were observed through the mediator variables. Specifically, participation in the budget had a significant effect on performance through *Fairness*, as described below. Mediator variable *Fairness* is the scale measured by the post-questionnaire concerning how fair the participants felt the goal-setting process and the difficulty of the targets were (Appendix 2). We used Model 4 in the SPSS PROCESS macro, which uses bootstrapping techniques with 5,000 resamples to establish a 95 percent confidence interval (CI) around the estimated indirect effect (Hayes 2018). As depicted in Figure 2, testing the indirect effect of budgetary participation on *Actual score* through *Fairness* showed a significant positive effect in which the 95 percent CI did not include zero ( $b = 0.017$ ,  $SE = 0.126$ , 95% CI 0.247, 0.752). Thus, Hypothesis H1 was supported through the mediator variables.

*(Insert Table 4 about here.)*

*(Insert Figure 2 about here.)*

## **Tests of H2**

Hypothesis H2 predicts that budgetary participation reduces misreporting of performance.

The t-test and Mann–Whitney U test showed that, contrary to our prediction, the mean value of

*Dishonesty* was significantly higher for the participation compared to the no participation condition (t

= -5.138,  $p < 0.01$ ; Table 5). Thus, hypothesis H2 was not supported. This result is an unintended

consequence that contradicts previous research. We discuss these results in the next section.

*(Insert Table 5 about here.)*

## **V. DISCUSSION**

In this section, we examine why participation in the budget had the unintended consequence of increasing misreporting. We believe that it is important to consider three relationships—budget participation, task performance, and misreporting—as shown in RQ1 and RQ2.

## **V-1. Rethinking of H1**

First, we consider the possibility that task performance may be a significant factor in increasing misreporting when the budget goal setting participation. As shown in H1, a comparison of task performance between the two conditions in the full sample ( $N = 1,512$ ) showed that performance was non-significantly higher for the participation than the no participation condition. However, analysis of performance for the goal-not-achieved sample ( $N = 1,073$ ) showed the mean values of the *Actual score* were 12.74 ( $SD = 11.27$ ) for the participation condition and 14.71 ( $SD = 10.88$ ) for the no participation condition, and significantly differed at  $p < 0.01$  ( $t = 2.90$ ). In other words, the results of this analysis were opposite to those of the full sample. This suggests that high performance may be one factor that increased misreporting of budget goal setting participation. We discuss this point further in subsection V-2.

## **V-2. Proximity and Reporting Behavior: The Test for RQ1 and RQ2**

To elucidate the unintended consequence concerning H2, we examine RQ1 and RQ2 in this subsection. We focus on the distance between actual performance and the target. The distance to the target, which we call *Proximity*, is defined as follows:

$Proximity = (Target\ score - Actual\ score) / Target\ score, 0 < Proximity \leq 1.$

The closer *Proximity* is to zero, the higher is the participant's performance in the slider task (i.e., greater sincerity of the participant's commitment to the slider task).<sup>11</sup> In this subsection, the sample is divided into four parts according to the numerical level of *Proximity* (Table 6).

*(Insert Table 6 about here.)*

Firstly, for RQ1, dishonesty by *Proximity* level was used to investigate the relationship between performance and reporting (Table 7).

*(Insert Table 7 about here.)*

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<sup>11</sup> In the no participation condition, *Proximity* was calculated using target score = 32. In the participation condition, *Proximity* was calculated using the actual target score (from 30 to 35) determined by each participant in each round.



Table 7 reveals the following two findings in the total sample: in the case of domain A, in which the participant did not try hard to perform the task and performance was low, the levels of dishonesty were high; and, in the case of domain D, in which the participant tried hard to perform the task and performance was high, the levels of dishonesty were low. These findings are consistent with the moral disengagement theory: integrity in the slider task had a positive effect on reporting behavior. Thus, when participants performed the slider task with integrity, they also reported their performance honestly and vice versa. Hence, the answer to RQ1 was “Yes” (when performance was high (or low), reporting was honest (or dishonest)).

Furthermore, for domains B and C, where the participant’s engagement in the slider task was neither sincere nor insincere, the levels of dishonesty differed across conditions: the levels of dishonesty were higher for the participation than the no participation condition (Table 7)<sup>12</sup>. In other words, in these domains, the task performance and reporting behavior were not related, and instead, the difference in conditions affected misreporting behavior. Table 8 shows the results of the regression analysis in domains B and C used to confirm the influence of conditions.

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<sup>12</sup> The t-test in domains B and C showed a significant difference between participation and no participation conditions ( $t = 7.06$ ,  $df = 331.83$ ,  $p = 0.000$ ).

*(Insert Table 8 about here.)*

Panels A and B in the Table 8 both show that the interaction term between the condition and the sense of responsibility positively influenced the levels of the dishonesty—the effect of the sense of responsibility on misreporting was stronger for the participation condition. This result suggests that the levels of dishonesty were higher for the participation condition, because the sense of responsibility strengthened the psychological demand to achieve the target, even if it meant lying. Thus, for RQ2, the budgetary participation enhanced dishonest reporting mediated by the sense of responsibility in domains B and C, for which task performance and reporting behavior were unrelated.

In summary, in domains A and D, where sincerity and lack of sincerity concerning the slider task were clear, the psychological mechanisms of the moral disengagement theory came into play, and sincerity toward the task influenced the reporting behavior. However, in domains B and C, for which engagement to the slider task was neither sincere nor insincere, the task performance and the reporting behavior became unrelated, and so budgetary participation enhanced dishonest reporting through the mediation of the sense of responsibility. Thus, the change in the relationships among participation,

task performance, and reporting behavior in each domain is the very reason that, overall, the dishonesty in reporting was greater for the participation than the no participation condition.<sup>13</sup>

## **VI. Conclusion**

To examine the impact of a set of goal-setting processes on both performance and its misreporting behavior, we conducted an online experiment using MTurk and oTree, in which participants were asked to perform a real effort task and a goal-reporting behavior (N = 378).

Comparing the performance and reporting behavior of participants in conditions with and without participation in the goal-setting process resulted in four findings. First, budgetary participation had a positive effect on task performance. Second, dishonest performance reporting was more frequent for the participation than the no participation condition. Although the first finding replicates the results of previous research, the second was an unintended consequence that contradicted previous research. Third, the overall results between task performance and reporting behavior were consistent with the moral disengagement theory, with task sincerity consistent with reporting sincerity. Fourth, when task performance was moderate (i.e., task efforts were neither sincere nor insincere), the relationship between

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<sup>13</sup> Please see Appendix 3 for our additional analyses.

the task and reporting became weaker, and budget participation affected participants' sense of responsibility, which in turn increased false reporting. In particular, the results in the third and fourth findings explain the unintended consequence of the second finding. Thus, the change in the relationships among participation, task performance, and reporting behavior in each domain was the reason why, overall, the dishonesty in reporting was greater for the participation than the no participation condition.

Despite its contributions, this study has several limitations. Some of these limitations are inherent to the use of a controlled online experiment and relate to the generalizability of our findings to real-world settings. Caution is recommended when extrapolating our experimental results to real-world situations because our experimental settings were highly controlled.

## Appendix 1. Instructions for the Experiment

These are the instructions for the participation condition. The underlined text in italics varies depending on the participation/no participation conditions.

### Instructions for the Task

Your role is an employee of a manufacturing company. You work as part of a team that is tasked with making a popular product. You manufacture the products and report the number of completed products to your manager.

This task will take approximately 20 minutes to complete. When you have finished the post-questionnaire, you will receive a survey code to paste into a box on the Amazon MTurk website. You will need this survey code to receive credit for completing the task. Your compensation depends on how well you perform each part of this task (see Section 1-3 entitled “Your Compensation” below for more details). You will get an opportunity for additional bonus compensation depending upon how you perform.

### Your Task

#### 1-1 Task Procedure

You are an employee of a company, and your job entails setting target goals for creating a product with your boss.

(1) At the beginning of each round, your boss will provide you with a target *range and a justification for the number of products to be created. Please decide your production quantity target for the round from the target range. It's up to you to make the final decision on the target goal.*

(2) After the target goal is set, the task starts. Please try to achieve the production quantity target *that you set for yourself.*

(3) At the end of the task, the number of products that you created during this round will be displayed. You will then check the actual score and report the number to your boss.

**ATTENTION:** Your boss does not know how many products that you actually created. In other words, the number of products is self-reported. You can make a false declaration without your boss knowing. If you choose to lie about your score, you will not be caught. However, you will have to live with the knowledge that you chose to lie.

After reporting to your boss, please indicate your current level of fatigue.

You have completed one round of the task. You will repeat this process (from the target set to the reporting) five times.

### 1-2 Product Creation: Slider Task

Product creation will be depicted or accomplished through the use of a “slider task.” The slider task consists of a screen displaying 40 sliders. When you start a slider task, all of the sliders are positioned at 0. Your task is to position each of the sliders on the screen to the target position of 50. You will have 90 seconds to complete this task. The more sliders you move to the position of 50 within 90 seconds, the closer you will be to achieving your target goal.

You can adjust each slider to any position between 0 and 100 by moving the slider with your mouse and dragging it to the desired position. Each slider can be adjusted and readjusted an unlimited number of times. The current position of each slider is displayed to the right of the slider. A schematic representation of a slider in both the initial and the target position is shown below in Figure 1a and b.



**Figure 1 (a)** Slider at initial position



**Figure 1 (b)** Slider at the target position

In 90 seconds, move as many sliders as you can to the target position of 50. One round lasts for 90 seconds, and you will complete the task five times, for a total of five rounds.

The first round is a practice round, and your pay is NOT affected by the practice round. The second, third, fourth, and fifth rounds are the OFFICIAL rounds, and your pay is affected by these four OFFICIAL rounds.

## Description of the Task Screen

A counter at the top right of the screen tells you the number of the current round. A screenshot of the slider task is shown below in Figure 2.

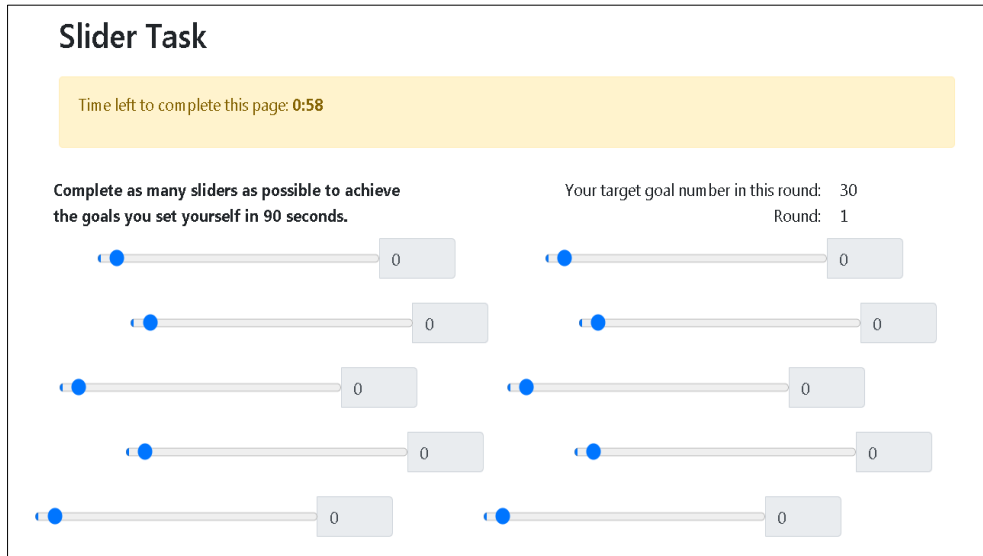


Figure 2 Screenshot of slider task

## 1-3 Your Compensation

**Your total compensation = Fixed pay \$2 + Total bonus variable compensation**

The fixed pay throughout your all task is \$2. For each OFFICIAL round, the bonus variable compensation is determined by whether you have achieved your target goal. If you achieve your target goal, the bonus variable compensation will be \$0.5 per round. If you fail to achieve your target goal, the bonus variable compensation will be \$0. The total bonus variable compensation depends on the number of OFFICIAL rounds of goal achievement. As there are four OFFICIAL rounds, the maximum of the total bonus variable compensation is \$2 and the minimum is \$0.

The assessment of whether the goal has been achieved is based on the number you self-report to your boss, NOT the actual number you create.

The total bonus variable compensation will be paid after all of the tasks. If you do not complete the task, you will not be compensated. If you do not paste an accurate survey code into a box on the Amazon MTurk website, you will not be compensated.

## **Post-Questionnaire**

After you finish the task, you will be automatically directed to the post-questionnaire.

If you have carefully read through the instructions, please fill out the following form and click the button below to proceed to the control questions.



## Appendix 2. Post-Questionnaire

**Please indicate the extent of your agreement with each of the following statements on a 7-point scale.<sup>14</sup> Please rate the extent from 1 (not fair at all) to 7 (very fair).**

1. How fair would you judge the procedures to set target goals?
2. How fair would you judge the target provided by your boss?
3. The target goal for the OFFICIAL rounds was fair.

**Please indicate the extent of your agreement with each of the following statements on a 7-point scale.<sup>15</sup> Please rate the extent from 1 (strongly disagree) to 7 (strongly agree).**

1. I felt responsibility for setting the target goal.
2. I was expected to meet the target goal.
3. I felt responsibility for meeting the target goal.

**For each of the following statements, please indicate how true it is for you.<sup>16</sup>**

*The scale range is 1–7, where 1 = not at all true, 4 = somewhat true, and 7 = very true.*

1. I enjoyed doing the slider task very much.
2. The slider task was fun to do.
3. I would describe this activity as very interesting.
4. I thought this activity was quite enjoyable.

**Please answer the following questions on a 7-point scale (1 = strongly disagree to 7 = strongly agree).<sup>17</sup>**

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<sup>14</sup> Uses the procedural justice measure, originally constructed by Libby (1999) and Tyler and Lind (1992).

<sup>15</sup> Uses the sense of responsibility measure, originally constructed by Libby et al. (2019).

<sup>16</sup> Uses the intrinsic motivation measure, originally constructed by Ryan (1982).

<sup>17</sup> Uses the prevention focus measure, originally constructed by Higgins (1997) and Welsh et al. (2019).

1. For each target goal, I focused on preventing negative outcomes.
2. For each target goal, I focused on preventing losses.
3. For each target goal, I focused on how to prevent failure.

**Please answer the following questions on a 7-point scale.<sup>18</sup>**

1. How committed are you to attaining your responsibility target goals? (1 = not at all committed, 7 = very committed).
2. How important is it to you to at least attain your responsibility target goals? (1 = very unimportant, 7 = very important).
3. To what extent are you striving to attain your responsibility target goals? (1 = to no extent, 7 = to a great extent).

**Please indicate the extent to which you agree or disagree with your feelings toward your boss concerning this task on a 5-point scale as follows: (1 = I completely disagree, 2 = I disagree, 3 = neutral, 4 = I agree and 5 = I completely agree).<sup>19</sup>**

1. I can trust my boss.
2. I think my boss will always act in my favor if given the chance.
3. I am convinced that my boss will always fully and honestly keep me up to date of everything that is important to me.

**How old are you?**

**What is your gender?**

**How much is your annual income?**

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<sup>18</sup> Uses the goal commitment measure, originally constructed by Latham and Steele (1983) and Wenzel (2002).

<sup>19</sup> Uses the trust in superiors measure, originally constructed by Hartmann and Slapnicar (2009).

### Appendix 3. Supplemental Analysis about *Misreporting Likelihood*

#### Frequency (Percentage) of *Misreporting Likelihood* by Each Proximity Level

	Domain			
	A	B	C	D
Misreported	379	60	156	119
Not Misreported	36	52	127	144
Total	415	112	283	263
Misreported Percentage	0.91	0.54	0.55	0.45

Note: The variable *Misreporting likelihood* measures whether participants overstated their score. It is coded as 1 if they misreported, and 0 otherwise, and captures the proportion of participants who misreported their score each domain.

#### Results of Probit Analysis Effect on *Misreporting Likelihood* in Domains B and C (n = 395)

Term	Estimate	Std. Error	z-value	p-value	
Intercept	2.353	0.439	5.359	0.000	***
Treatment	-0.331	0.601	-0.550	0.582	
Responsibility	-0.388	0.070	-5.546	0.000	***
Treatment × Responsibility	0.258	0.116	2.311	0.021	**
Gender	-0.017	0.141	-0.121	0.008	***
Age	-0.016	0.006	-2.659	0.903	

Note: \*\*\*/\*\*/\* indicates significance at  $p < 0.01$ ,  $< 0.05$ , and  $< 0.10$ , respectively.

*Misreporting likelihood* measures whether participants overstated their score. It is coded as 1 if they misreported, and 0 otherwise. The independent variable Treatment is coded as 0 = no budgetary participation condition, and 1 = budgetary participation condition. The independent variable Responsibility is measured by the post-questionnaire (see Appendix 2). The independent variable Treatment × Responsibility is the interaction term between Treatment and Responsibility. Gender and Age are control variables. Gender is coded as 0 = male, 1 = female. Age is the age of the participants. For an explanation of domains B and C, see the note in Table 6.



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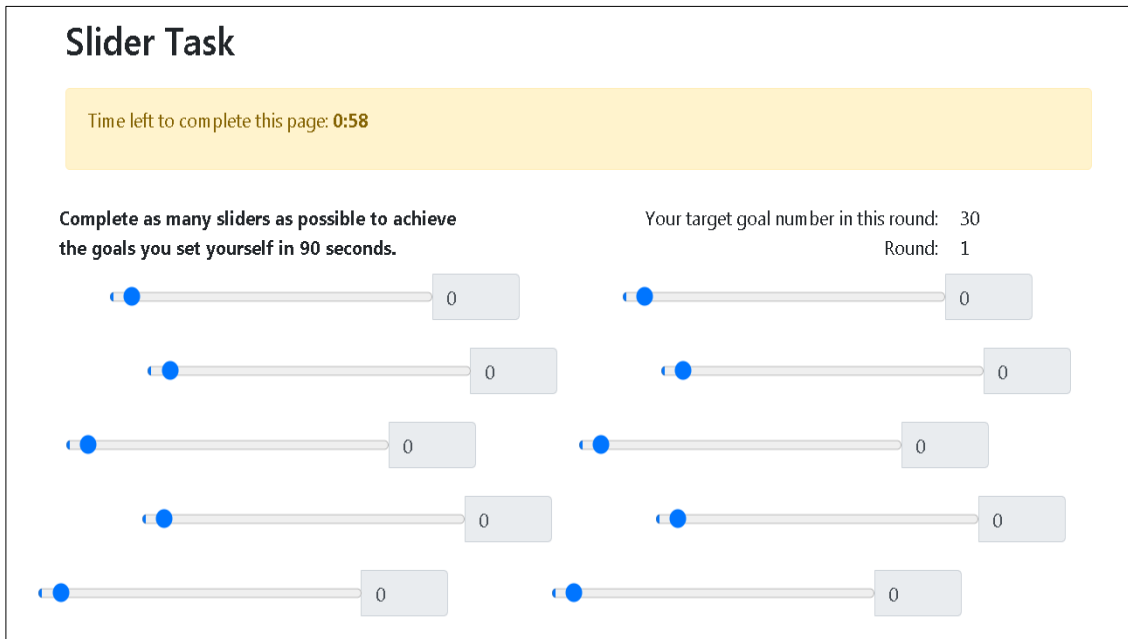
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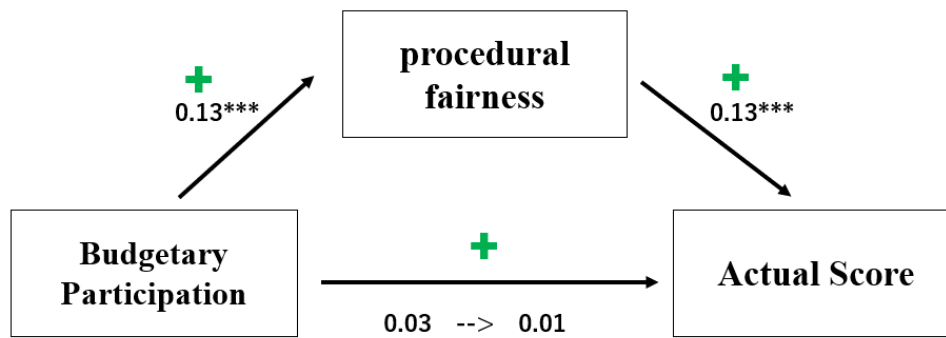
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**FIGURE 1 Slider Task**



Note: This is a screenshot of the slider task used in the experiment, which is a simple task in which a slider with a range of 0–100 is set to “50” using the mouse, and the number of sliders completed within the time limit is measured. Since it is a task that can minimize the potential influence of the participant (e.g., Gill and Prowse 2012), we adopted it as a means of measuring participants’ performance on the task in this study. In our experiment, participants were given a task of how many of a maximum of 40 sliders they could complete within 90 seconds.

**FIGURE 2 Results of Mediation Model**



Indirect Effect = 0.017, 95%  $CI_{bs}$  [0.247, 0.752]

Note: N = 1,512. Bootstrap sample size = 5,000. We coded budgetary participation as 1 and no budgetary participation as 0. Actual Score shows the actual completed number of slider in each round. \*\*\* p < 0.01. The coefficients shown in the figure are standardized.

**TABLE 1 Descriptive Statistics for the Slider Task**

	Target score	Reported score	Actual score
Budgetary participation (n = 768)	31.57 [2.54]	28.70 [10.04]	20.14 [14.45]
No Budgetary participation (n = 744)	32 [0]	26.40 [10.44]	19.43 [13.12]

Note: N = 1,512. [ ] shows standard deviation.

**TABLE 2 Descriptive Statistics for Misreporting Tendencies****Panel A Frequency (Percentage) of Misreporting Likelihood**

	Not misreported	Misreported	Total
Budgetary participation	115 (22.3%)	401 (77.7%)	516 (100%)
No budgetary participation	244 (43.8%)	313 (56.2%)	557 (100%)
Total	359	714	1,073

**Panel B Mean (Standard Deviation) Dishonesty**

	Budgetary participation	No budgetary participation
Dishonesty	0.420 [0.326]	0.314 [0.345]

Note: N = 1,073. [ ] shows standard deviation. Dishonesty is calculated as (Reported Score – Actual Score)/(40 – Actual Score) and represents the percentage of the available room for overstatement that is actually used.



**TABLE 3 Descriptive Statistics about Mediator Variables**

Panel A: Full Samples(N=1512)

	Fairness	Responsibility	Intrinsic Motivation	Prevention Focus	Commitment	Trust
Budgetary participation (n=768)	4.99 [1.73]	5.72 [1.26]	3.82 [2.23]	4.43 [2.03]	5.78 [1.50]	3.69 [1.03]
No Budgetary participation (n=744)	4.51 [1.89]	5.09 [1.23]	4.07 [2.04]	4.65 [1.94]	5.88 [1.36]	3.38 [1.10]

Panel B: Goal-not-achieved Sample (N=1073)

	Fairness	Responsibility	Intrinsic Motivation	Prevention Focus	Commitment	Trust
Budgetary participation (n=516)	4.57 [1.73]	5.53 [1.31]	3.99 [2.29]	4.71 [1.56]	5.63 [1.54]	3.62 [1.08]
No Budgetary participation (n=557)	4.11 [1.87]	5.01 [1.28]	3.95 [2.08]	4.62 [1.88]	5.76 [1.45]	3.26 [1.12]

Note: This table shows the descriptive statistics for mediator variables. For the explanation of each variable, see Appendix 2.

**TABLE 4 Tests of Differences About Actual Score**

		Tests of differences			
		t-test		Mann–Whitney U	
Budgetary participation	No budgetary participation	t	p-value (two-tailed)	W	p-value (two-tailed)
20.14 [14.45]	19.43 [13.12]	-1.01	0.310	272,920	0.131

Note: N = 1,512. [ ] shows standard deviation.

**TABLE 5 Tests of Differences About Dishonesty**

		Tests of differences			
		t-test		Mann–Whitney U	
Budgetary participation	No budgetary participation	t	p-value (two-tailed)	W	p-value (two-tailed)
0.420 [0.326]	0.314 [0.345]	-5.138	0.000	115,002	0.000

Note: N = 1,073. [ ] shows standard deviation. Dishonesty is calculated as (Reported Score – Actual Score)/(40 – Actual Score) and represents the percentage of the available room for overstatement that is actually used.

**TABLE 6 Sample Split According to Proximity Level**

Domain	Levels of proximity	Explanation
A	$0.75 \leq \text{Proximity} \leq 1$	Far from the target and low integrity of effort
B	$0.50 \leq \text{Proximity} < 0.75$	
C	$0.25 \leq \text{Proximity} < 0.50$	
D	$0 < \text{Proximity} < 0.25$	Close to the target and high integrity of effort

Note: This table shows the sample split according to the proximity level. We focus on the distance between actual performance and the target. The distance to the target, which we call *Proximity*, is defined as follows:  $\text{Proximity} = (\text{Target score} - \text{Actual score}) / \text{Target score}$ ,  $0 < \text{Proximity} \leq 1$ . When the level of proximity is  $0.75 \leq \text{Proximity} \leq 1$ , we refer to that state as domain A. In domain A, performance is far from the target and integrity of the participant's effort is low. When the level of proximity is  $0 < \text{Proximity} < 0.25$ , we refer to that state as domain D. In domain D, performance is close to the target and integrity of the participant's effort is high.

**TABLE 7 Levels of Dishonesty by Each Proximity Level**

Condition	Proximity			
	Far from the target (Performance: low)			Close to the target (Performance: high)
	Domain A	B	C	D
Budgetary participation (n = 516)	0.549 (221)	0.536 (49)	0.383 (113)	0.193 (133)
No budgetary participation (n = 557)	0.548 (194)	0.165 (63)	0.229 (170)	0.148 (130)
Total (N = 1,073)	0.548 (415)	0.328 (112)	0.29 (283)	0.17 (263)

Note: This table shows the levels of dishonesty by each proximity level. ( ) shows the number of the observations. Dishonesty is calculated as  $(\text{Reported Score} - \text{Actual Score}) / (40 - \text{Actual Score})$  and represents the percentage of the available room for overstatement that is actually used. For an explanation of domains A–D, see the note in Table 6.

**TABLE 8 Results of Regression Analysis in Domains B and C****Panel A: Domain B (n = 112, Adjusted R-squared = 0.271)**

Term	Estimate	Std. Error	t-value	p-value	
Intercept	0.497	0.184	2.699	0.008	***
Treatment	-0.049	0.274	-0.177	0.860	
Responsibility	-0.079	0.031	-2.578	0.011	**
Treatment × Responsibility	0.088	0.051	1.701	0.092	*
Gender	-0.022	0.063	-0.352	0.726	
Age	0.002	0.003	0.724	0.470	

**Panel B: Domain C (n = 283, Adjusted R-squared = 0.172)**

Term	Estimate	Std. Error	t-value	p-value	
Intercept	0.795	0.099	8.065	0.000	***
Treatment	-0.164	0.127	-1.290	0.198	
Responsibility	-0.080	0.015	-5.428	0.000	***
Treatment × Responsibility	0.067	0.024	2.813	0.005	***
Gender	-0.061	0.033	-1.854	0.065	*
Age	-0.002	0.001	-1.288	0.199	

Note: \*\*\*/\*\*/\* indicates significance at  $p < 0.01$ ,  $< 0.05$ , and  $< 0.10$ , respectively. *Dishonesty*, which is a dependent variable, is calculated as  $(\text{Reported Score} - \text{Actual Score}) / (40 - \text{Actual Score})$  and represents the percentage of the available room for overstatement that is actually used. The independent variable Treatment is coded as 0 = no budgetary participation condition, and 1 = budgetary participation condition. The independent variable Responsibility is measured by the post-questionnaire (see Appendix 2). The independent variable Treatment × Responsibility is the interaction term between Treatment and Responsibility. Gender and Age are control variables. Gender is coded as 0 = male, 1 = female. Age is the age of the participants. For an explanation of domains B and C, see the note in Table 6.