

**THE EFFECTS OF BUDGET LEVELS, PARTICIPATION, AND REPEATED-INTERACTION  
ON EMPLOYEE EFFORT**

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### **ABSTRACT**

We use a laboratory experiment to investigate how the level of a budget assigned to an employee by a firm owner affects employee effort. Consistent with reciprocity and fairness models, we find a negative relationship between budget levels and employee effort – many employees responded to a low budget with high effort and responded to a high budget with low effort. We observed higher levels of reciprocal behavior (i.e., lower budgets and higher effort) when the same employee-owner dyad interacted for multiple periods relative to dyads only interacting for a single period. Further, we find that employee participation in the budget-setting process was beneficial to owners when they interacted with employees for multiple periods but detrimental to owners when they interacted with employees for only a single period. Collectively, our results help to reconcile the mixed evidence of prior empirical research examining how budget level difficulty and employee participation affect the efficacy of budget-based performance evaluation and reward systems.

**Keywords:** *budget-based contracts; budget levels (targets); participation; reputation, social preferences*

**Data Availability:** Contact the author.

# **The Effects of Budget Levels, Participation, and Repeated-Interaction on Employee Effort**

## **I. INTRODUCTION**

Budgets can play an important role in motivating desirable behavior by serving as a basis for evaluating and rewarding employee performance (Zimmerman 2003, Ch. 6). While the motivational role of budget-based performance evaluation and reward systems has been the focus of a large body of research, competing perspectives still exist as to how budget-level difficulty affects the efficacy of these incentive systems. On the one hand, prior experimental research suggests that high (challenging) budgets induce higher levels of employee performance than lower (easily attainable) budgets (Locke and Latham 1990; Chow 1983; Hirst and Yetton 1999). Further, popular management accounting textbooks advocate the use of challenging budgets to evaluate and reward employees (Horngren et al. 2003, Ch. 6; Atkinson, Kaplan, and Young 2004, Ch. 10). On the other hand, prior archival studies demonstrate that organizations typically utilize low (easily attainable) budgets to evaluate and reward employee performance (Merchant and Manzoni 1989; Simon 1988; Van der Stede 2000). While this literature often speculates that organizations may use low, easily attainable budgets to boost employee moral and ensure employees “feel like winners” when they can regularly exceed their budget targets (Merchant and Van der Stede 2003, Ch. 9), it is unclear from this literature how these proposed advantages could ultimately benefit the firm especially when compared to settings utilizing more challenging budgets.

To contribute to a better understanding of these competing perspectives, we explore the potential role employees’ preference for reciprocity plays in affecting the relationship between budget levels and employee effort. Prior research suggests that many employees are motivated by reciprocity or the desire to reward the kind acts and punish the unkind acts of their employers even when they incur a personal cost to do so (e.g., Hannan 2005; Fehr et al. 1997; Fehr and Gächter 2000). To the extent employees exhibit and act on these preferences in a budgeting setting, it is possible that increasing budget levels could have a negative effect on employee effort. That is, employees motivated by reciprocity may reward

employers assigning low, easily attainable budgets with high levels of effort and punish employers for setting high, more difficult to attain budgets with low effort.

To explore this possibility, we conducted a laboratory experiment where 120 undergraduate business students were randomly assigned the role of either a firm owner or an employee. Owner-participants assigned employees a budget. Once assigned this budget, employee-participants decided how much effort to contribute to the firm. This effort was costly to the employee but beneficial to the owner. Employees received a bonus whenever their chosen effort level met their assigned budget. The size of the bonus did not depend on the level of the budget. Therefore, by assigning employees a higher budget, the owner could potentially motivate employees to choose higher levels of effort without increasing the bonus paid to the employee.

Employees had economic incentives to choose just enough effort to meet the budget. If owners believed that employees would act on these economic incentives, then they would have expected a positive relationship between budget levels and effort. Further, it would be in the owners' best interest to assign employees a high budget. Despite these incentives, our results demonstrate that a negative relationship exists between budget levels and effort which ultimately led owners to assign lower budgets.

We examined the relationship between budget levels and effort across four environments. We created these environments by manipulating two aspects of our setting at two-levels each between subjects. First, each employee and owner interacted for only a single period or multiple periods. Second, employees could either participate in the budget-assignment process by sending a message to the owner prior to being assigned a budget or could not participate in the budget-setting process.

We observed lower budgets and higher effort (i.e., stronger reciprocal behavior) when the same employee-owner dyad interacted for multiple periods when compared to dyads only interacting for a single period. Further, the effect of employee participation on behavior depended on whether employees and owners interacted for a single or multiple periods. The effect of employee participation on budget levels and effort was more beneficial (detrimental) to the payoffs of owners (employees) when employees and owners interacted for multiple periods when compared to dyads interacting for a single period.

Contributing to an understanding of this result, employees' responses to a post-experimental questionnaire indicated that employee participation had a positive effect on employees' concerns for the payoffs of owners when dyads interacted for multiple periods and had a negative effect on these concerns when dyads interacted for only a single period.

Collectively, our results have a number of important implications. First, our results help reconcile the mixed evidence of prior empirical research examining how budget levels affect the efficacy of budget-based performance evaluation and reward systems. We demonstrate that when employees are motivated by reciprocity, assigning low, easily attainable budgets may be in the best interest of firm owners. While prior experimental work often finds that high budgets induce greater levels of employee performance than lower budgets, this prior work utilized settings where employees' preference for reciprocity would play a limited role in affecting behavior. For example, employee-participants in prior experimental work were typically assigned budgets exogenously by the experimenter rather than being assigned endogenously by other participants in the experiment (Locke and Latham 1990; Chow 1983; Hirst and Yetton 1999).

Second, our results contribute to the literature examining the effects of employees' non-pecuniary preferences on budgeting. Prior literature has primarily focused on settings where budgets were solely used to elicit employees' private information. This literature demonstrates employees' preferences for honesty and equity can significantly reduce budgetary slack (Evans et al. 2001; Hannan et al. 2005; Rankin et al. 2006). When used strictly to motivate employee effort, however, our study suggests that employees' preference for reciprocity may lead owners to intentionally build slack into budgets.

Finally, our results help reconcile mixed evidence examining the effects of employee participation on their social preferences. Organizational behavior theory argues that allowing employees to play a participatory role in the budget-assignment process makes them feel like a greater part of the organization and increases their desire to take actions that benefit the firm for its own sake (e.g., see Tyler 1993; Tyler and Blader 2000, Ch. 8). However, recent work in accounting suggests that employee participation in the budget-assignment process could make employees behave in a more self-interested

manner (Rankin et al. 2006). Our results contribute to a better understanding of the environments in which each of these perspectives would be more descriptive of behavior.

The remainder of this paper is organized into four sections. Section two presents our research setting and hypotheses. Section three explains the methods we use to test the hypotheses. Section four presents the results, and section five provides a summary and discussion of the results.

## II. RESEARCH SETTING AND THEORY

In this section, we first describe our research setting. To facilitate this discussion, we present the actual parameters used during our experiment. Second, we demonstrate that if employees choose the effort level that maximizes their individual payoffs, then a positive relationship would exist between budget levels and effort. Third, we present behavioral theory raising the possibility that a negative relationship could exist between budget levels and effort. Finally, we discuss how two features of a budgeting environment, repeated interaction and employee participation, could also have a behavioral effect on the relationship between budget levels and effort.

### Research Setting

We consider a setting where a firm owner assigns a budget to an employee that serves as the basis for rewarding employee effort. We assume this budget can take on integer values between one and twenty. The employee receives a bonus of \$4.20 for choosing enough effort to meet the budget and additional compensation of \$0.1263 for each unit of employee effort over and above the budget.<sup>1</sup>

Once assigned a budget, the employee decides on an effort level which can take on integer values between zero and twenty. As is assumed in most agency research, effort is increasingly costly to the employee. We represent this cost by assuming employees must pay \$0.20 for each of the first ten units of effort and \$0.21 for each additional unit of effort.

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<sup>1</sup> The relationship we assume between budget levels and employee effort (performance), where employees receive a bonus for meeting a budget and an additional linearly increasing reward for exceeding the budget, is the one most commonly found in practice (Murphy 2001).

Each unit of employee effort contributes \$0.45 to the firm. Since the marginal benefit to the firm exceeds employees' marginal cost for choosing additional units of effort (i.e., either \$0.20 or \$0.21 per unit), the joint payoffs shared between employees and owners are increasing in effort. Of this joint payoff, the owner receives the contribution to the firm from the employees' effort less the compensation paid to the employee from the budget-based reward system. The employees' total payoff is their total compensation less the total cost of effort.

Employee and owner payoffs for a subset of budget level and effort combinations are presented in Table 1. Notice from this table, that the joint payoffs shared between employees and owners are solely a function of employee effort – the greater the effort, the greater the joint payoffs. The distribution of these joint payoffs is determined by the budget level. As the budget level increases, the owners' (employees') share of the joint payoffs either increases (decreases) or stays the same.<sup>2</sup>

### **Strict Economic Predictions**

Employees have the incentive to choose just enough effort to meet the budget. The \$4.20 bonus paid to the employee for reaching the budget exceeds the total cost of effort the employee must incur to reach any budget. For example, choosing the twenty units of effort necessary to reach a budget of twenty costs the employee \$4.10. Further, the marginal cost of employee effort (either \$0.20 or \$0.21) exceeds the piece-rate of \$0.1263 paid for each unit of effort over the budget. Table 1 illustrates this point by demonstrating that, for any budget, employees maximize their payoff by choosing the effort level that just meets their assigned budget. Further, this table demonstrates that if employees choose the amount of effort that maximize their payoffs, then a positive relationship would exist between the budget level assigned to the employee and effort.

**Economic H1:** A positive relationship exists between budget levels and employee effort.

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<sup>2</sup> In our setting, employee effort is observable and can serve as the basis of reward. In an environment where effort is observable, agency theory suggests that the optimal contract pays employees just above what they can earn from their outside opportunities (which, in our experimental setting would be zero), and the owner receives the additional surplus from the employment relationship. Notice in Table 1, by setting a budget level of twenty, owners can mirror this optimal contract.

If a positive relationship exists between budget levels and employee effort, then owners' total payoff is increasing in the level of the budget assigned to the employee. The owner would reward the employee the \$4.20 bonus regardless of the level of the budget. However, effort and, hence, employees' contribution to the firm would be increasing in the budget level. Thus, owners have the incentive to assign employees the highest budget (twenty), and the employee has the incentive to choose twenty units of effort to reach the budget (see Table 1).

**Economic H2:** Firm owners assign the highest budget to employees.

### **Behavioral Predictions**

The economic predictions discussed above assume employees respond to their assigned budget with the effort level that maximizes their personal payoffs. However, prior empirical research suggests that the decisions of many employees are motivated not only by self-interest, but also by reciprocity which is the desire to reward those who treat them kindly and punish those who treat them unkindly even when they incur a personal cost for doing so (Fehr and Gächter 2000). Moreover, research has demonstrated both forms of reciprocity – negative reciprocity has been observed in such settings as ultimatum bargaining games and positive reciprocity has been observed in such settings as gift-exchange games (e.g., see Camerer 2003 for a review). Unlike much of this prior research, however, a budgeting setting provides employees the opportunity to engage in both forms of reciprocity in a single environment.

First, employees have the opportunity to punish owners by choosing little or no effort when assigned a high budget even though this action would not result in the highest payoff for the employee. As mentioned above, as the budget increases, the amount of effort the employee must choose to meet the budget also increases. While choosing higher effort increases total payoffs, Table 1 illustrates that employees' share of these payoffs decreases as the budget increases. To the extent employees believe that being assigned a high budget and, hence, being offered a small share of total payoffs by the owner is

unkind (unfair), employees may forgo the wealth of meeting the budget and choose low effort in order to punish the owner.

Second, employees motivated by reciprocity may choose high effort in response to a low budget even though this action would not result in the highest payoff for the employee. While assigning a low budget provides employees the incentive to choose low effort to the detriment of the owner, it also provides employees a large share of total payoffs even when employees choose high effort (see Table 1). To the extent employees believe that being assigned a low budget and, hence, being offered a large share of total payoffs by the owner is a kind act, employees may forgo the wealth of just meeting the budget and choose high effort in order reward the owner.

If employees exhibit both positive and negative forms of reciprocity in a budgeting environment, then a negative relationship could exist between budget levels and effort. That is, employees could choose high effort when assigned a low budget and low effort when assigned a high budget.

**Behavioral H1:** A negative relationship exists between budget levels and employee effort.

To the extent owners believe that employees are motivated by reciprocity, they face an interesting dilemma when deciding the budget level to assign employees. On the one hand, owners can try to set one of the higher budget levels and attempt to avoid negative reciprocity from the employee. Here, the owner would try to set a budget level just low enough that employees choose high levels of effort, but high enough to ensure the owner receives a large share of the joint payoffs.<sup>3</sup> On the other hand, owners can try to set a low enough budget in an attempt to induce employees to positively reciprocate by choosing high

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<sup>3</sup> By selecting one of the higher budget levels, the owner faces a tension very similar to that of the ultimatum bargaining game examined in the experimental economics literature. In ultimatum games, one individual makes an offer of how to split an amount of money and another individual decides whether to accept or reject the split. If accepted, the proposed split is implemented. If rejected, both individuals receive nothing (see Camerer 2003 for a review). By choosing one of the higher budget levels, owners are, in essence, offering a split of joint payoffs that employees can either accept by choosing high enough effort to reach the budget or reject by choosing low effort.

effort.<sup>4</sup> Both of these strategies, attempting to induce positive reciprocity or attempting to avoid negative reciprocity, would result in a lower budget level than predicted by the economic predictions.

**Behavioral H2:** Firm owners do not assign the highest budget to employees.

### **Repeated Interaction**

In general, prior experimental research has observed higher instances of both positive and negative forms of reciprocity when employee and owner dyads interact for multiple periods when compared to dyads that interact for only a single period (Slembeck 1999; Gächter and Falk 2001). When employees and owners interact for multiple periods, reciprocity can not only provide employees' the personal satisfaction (utility) for rewarding/ punishing the kind/ unkind actions of the owner, but it also has the potential of affecting the owners' future behavior. That is, in a repeated interaction setting, employees can punish owners by choosing low effort in response to being assigned a high budget in the hopes that this action would lead the owner to assign lower budgets in the future. Furthermore, employees can reward owners by choosing high effort in response to being assigned a low budget in the hopes that this action will lead owners to continue assigning a low budget in the future. To the extent employees' engage in and owners respond to reciprocal behavior, we would expect lower budgets and higher effort (i.e., stronger reciprocal behavior) when employees and owners interact for multiple periods when compared to dyads interacting for only a single period.

**Behavioral H3:** Budgets are lower and effort higher when employee and owner dyads interact for multiple periods when compared to dyads interacting for a single period.

### **Employee Participation in the Budget Assignment Process**

Research examining the effects of employee participation in the budget assignment process on behavior has produced mixed results. On the one hand, theory in organizational behavior argues that employees participating in the budget setting process feel a stronger psychological bond to the firm and

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<sup>4</sup> By selecting one of the lower budget levels, the owner faces a tension very similar to that of a gift-exchange game examined in the experimental economics literature. In a gift-exchange game, owners can pay employees higher than market wages in the hopes that the employee will positively reciprocate by choosing higher than enforceable levels of effort (Gächter and Fehr 2002).

identify to a greater extent with its members (Tyler and Blader 2000, Ch. 8). This stronger bond is posited to enhance employees' concerns for the payoffs of the firm and its owner and to increase employees' desire to make decisions beneficial to the firm and owner for its own sake (Tyler 1993). Overall, this research suggests that employees participating in the budget assignment process would have a greater tendency to choose high effort irrespective of the budget level assigned to them. To the extent that this tendency exists and owners take advantage of it, then employee participation could lead to higher budget levels. Holding effort constant, an increase in budget levels would lead to an increase (decrease) in the owners' (employees') payoffs.

On the other hand, recent research in accounting demonstrates that employees participating prior to being assigned a budget by the owner behave in a more self-interested manner. This research suggests that participation leads employees to frame the environment and their interactions with the owner more strategically (Rankin et al. 2006). With this framing, employees would be less concerned with the payoffs of the firm and its owner and would instead use their role in the budget-assignment process in an attempt to enrich themselves. To the extent that this tendency exists and employees are able to use their role in the budget assignment process to enrich themselves, then employee participation could lead to lower budget levels. Holding effort constant, an increase in budget levels would lead to an increase (decrease) in the employees' (owners') payoffs.

Because of these competing perspectives, we do not make directional predictions regarding the effects of employee participation in the budget setting process.

**Behavioral H4:** Employee participation in the budget setting process affects the level of the budget assigned to the employee.

### III. METHODOLOGY

#### Participants and Design

One hundred twenty-two undergraduate business students participated in our computer-based laboratory experiment. We employed a 2 (single or repeated interaction)  $\times$  2 (employee participation)  $\times$  8 (periods) mixed design. We manipulated single/ repeated interaction and employee participation between-

subjects and periods within-subjects. We randomly assigned participants to one of the following four budgeting environments: employee participation/ repeated-interaction, employee participation/ single-interaction, no employee participation/ repeated-interaction, and no employee participation/ single-interaction.

## **Procedures**

We randomly assigned participants to a computer terminal situated on one of two sides of a room separated by a solid partition. Participants on one side of the room assumed the role of the employee, and participants on the other side of the room assumed the role of owner. Participants read through a set of instructions on their computer screens and had to successfully complete a quiz to ensure their understanding of the experimental task.

Participants were provided the five budget level by five effort choice payoff matrix presented in Table 2. This payoff matrix presented a subset of the 20 budget levels by 21 effort choice matrix as described in the research setting section. We provided participants a subset of the larger payoff matrix to simplify the experimental task.

Each owner-participant was anonymously matched with an employee-participant. The owner selected one of the five budget levels. The selected budget-level was communicated to the matched employee. The employee then chose one of the five effort levels. This selection was communicated to the owner. These two choices determined each participant's compensation for the period as depicted in the payoff matrix presented in Table 2.

The budget assignment and effort selection choices were repeated for a total of eight periods. We manipulated whether the employee-owner dyad remained paired throughout all eight periods (the repeated-interaction condition) or whether the dyads were re-matched at the start of each period (single-interaction condition). In the single-interaction condition, each employee and owner was paired at most one of the eight periods during the experiment.

We also manipulated whether or not employees participated in the budget-assignment process by sending a non-binding message to the owner each period before the owner chose one of the five budget

levels. In the participation condition, employees were required to select a budget (X) and an effort level (Y) to complete the following message, “If you choose budget (X), I will choose Effort (Y)” where X and Y could each take on values one through five corresponding to the payoff matrix presented in Table 2. Both employee and owner participants knew the message was required to be sent and that the message was non-binding (i.e., the employee was not required to follow through with the message). In the no participation condition, the employee did not send a message to the owner prior to being assigned a budget.

After the eight periods, participants completed a post-experimental questionnaire. After completing this questionnaire, the participants received their cash compensation (the sum of their compensation for the eight rounds) and were dismissed.

#### **IV. RESULTS**

In this section, we first present the results of our experiment combined across all four budgeting conditions. We use these combined results to examine whether the economic or behavioral perspectives on our first two hypotheses are more descriptive of the behavior we observed in our experiment. Next, we present our results by condition to test hypotheses 3 and 4. Finally, we provide supplemental analyses to examine employees’ messages and responses to the post-experimental questionnaire.

##### **Combined Results – Hypotheses 1 and 2**

Hypothesis 1 from an economics perspective posits that a positive relationship exists between budget levels and effort, while hypothesis 1 from a behavioral perspective argues that budget levels and effort are negatively related. Panel A of Table 3 presents the mean budget level and effort selected as well as the correlation between these two variables by period. Budgets and effort are significantly negatively correlated for all eight periods ( $p < 0.05$ , two-tailed). These results suggest that, consistent with hypothesis 1 from the behavioral perspective, budget levels and effort were negatively related in our experiment.

As additional evidence of the negative relationship between budget levels and effort, thirty out of the fifty employee-participants (60 percent) that were offered the highest budget at least once always responded with the lowest possible effort. Only fifteen of the out of the fifty employee-participants (30 percent) that were offered the highest budget at least once never responded with the lowest possible effort. Further, twenty-five out of the thirty-four employee participants (74 percent) that were offered the lowest budget always responded with an effort level above two. Only three out of the thirty-four employee participants (9 percent) that were offered the lowest budget never responded with an effort level above two. Collectively, these results are consistent with employees exhibiting a preference for reciprocity and, because of this behavior, owners may prefer to assign a lower budget to employees.

Hypothesis 2 from an economics perspective posits that owners would select the highest budget level, while hypothesis 2 from a behavioral perspective argues that owners would not assign the highest budget. Panel B of Table 3 presents the budget level and effort selected across all conditions and periods. Overall, owners assigned the highest budget, budget level 5, 94 out of a possible 488 times or 19 percent of the time. Thus, consistent with hypothesis 2 from the behavioral perspective, budgets were set below the highest level a vast majority (81 percent) of the time.

#### **Results by Budgeting Environments – Hypotheses 3 and 4**

We present our results by experimental conditions in four tables: one for each of the following dependent measures: budget levels, effort, owner compensation, and employee compensation. Panel A of each table provides descriptive statistics by condition. Panel B of each table reports the results of the related ANOVA, with single/ multiple period interaction and employee participation as between-subjects factors, and period as the within-subjects (repeated-measure) factor.

Behavioral hypothesis 3 posits that budgets are lower and effort higher when employee and owner dyads interact for multiple periods when compared to dyads that interact for a single period. Panels A and B of Table 4 suggest that the mean budget level of 2.64 when dyads interact for multiple periods is significantly less than the mean budget level of 3.54 when participants interact for a single period ( $F = 18.47, p < 0.01$ ). Further, Panels A and B of Table 5 suggest that the mean effort of 3.76 when dyads

interact for multiple periods is significantly greater than effort of 3.04 when participants interact for a single period ( $F = 10.78, p < 0.01$ ). These results support behavioral hypothesis 3.

Behavioral hypothesis 4 posits that employee participation affects budget levels and effort. While Table 4 suggests that employee participation, alone, did not affect budget levels ( $F = 1.04, p = 0.31$ ), employee participation interacted with the single/ repeated-interaction manipulation. Panels A and B of Table 4 demonstrate that employee participation increased budget levels to a greater extent in an environment where employees and owners interacted for multiple periods when compared to an environment where employees and owners interacted for a single period ( $F = 6.61, p = 0.01$ ). Further, employee participation had a negative effect on budget levels when employees and owners interacted for a single period ( $t = 3.99, p < 0.01$ , two-tailed). However, Panel B of Table 5 demonstrates that employee participation, alone, did not affect employee effort ( $F = 0.04, p = 0.85$ ), nor did it interact with the single/multiple interaction manipulation to affect employee effort ( $F = 0.35, p = 0.56$ ).

Since employee participation did not affect effort, it did not affect the joint payoffs shared between employees and owners. However, by affecting budget levels, employee participation affected how these joint payoffs were distributed between employees and owners. Panels A and B of Table 6 show that employee participation was more beneficial to owners when employee-owner dyads interacted for multiple periods when compared to an environment where employee-owner dyads interacted for a single period ( $F = 4.32, p = 0.04$ ). Employee participation had a negative effect on owners' payoffs when dyads interacted for a single period ( $t = 1.818, p = 0.08$ , two-tailed). Further, Panels A and B of Table 7 show that employee participation was less beneficial to employees when employee-owner dyads interacted for multiple periods when compared to an environment where employee-owner dyads interacted for a single period ( $F = 9.58, p < 0.01$ ). Employee participation had a positive effect on employees' payoffs when employee-owner dyads interacted for a single period when compared to an environment where dyads interacted for multiple periods ( $t = 3.26, p < 0.01$ , two-tailed).

## Supplemental Analyses

To gain a better understanding of the effects of participation on the decisions of employees, we investigated how employee participation affected the non-pecuniary motivations underlying employee behavior. In a post-experimental questionnaire, we explored the extent to which employees were concerned about the payoffs of firm owners. Employees were provided the following statement in the post-experimental questionnaire, “I was concerned about how much (the owner) would make each work period.” Participants answered on a seventy-point Likert-type scale with “10” being “strongly disagree” and “70” being “strongly agree.”

As reported in Panels A and B of Table 8, employees interacting with the same owner for multiple periods were more concerned about the owners’ payoffs than employees interacting with a different owner each period ( $F = 9.16, p < 0.01$ ). While employee participation, alone, did not affect employees’ concerns for owners’ payoffs, employee participation interacted with our single/ multiple period interaction variable in a manner consistent with our results discussed in the previous section ( $F = 3.63, p = 0.01$ ). First, employee participation increased employees’ concerns for the payoffs of the owner when employee-owner dyads interacted for multiple periods ( $t = 2.02, p = 0.05$ , two-tailed). Second, employee participation decreased employees’ concerns for the payoffs of the owner when employee-owner dyads interacted for a single period ( $t = 1.82, p = 0.08$ , two-tailed). Overall, these results suggest that the effect of employee participation on employees’ concerns for the payoffs of owners increased their tendency to make decisions to beneficial to the owner when interacting in a repeated setting and increased their tendency to make decisions detrimental to the firm when interacting in a single-period setting.

One way that employees could use their participatory role in the budget-assignment process to make decisions in a manner that could be detrimental to the owner is to lie. Recall, employees participating in the budget assignment process selected a budget (X) and an effort level (Y) to complete and send the following message to the owner, “If you choose budget (X), I will choose effort (Y).” We characterize employees’ behavior as a lie when the owner ultimately assigned the budget level, X,

communicated in the employees' message, but the employee did not choose the effort level,  $Y$ , communicated in the message.

Table 9 provides evidence that employees in the single-period environment told more lies relative to employees in a repeated-interaction environment. This table presents the total number of times owners assigned the budget level communicated in the employees' message, the number of times the employee "lied" by not choosing the effort level communicated in their message, and the proportion of lies told over opportunities. As seen by this table, employees lied 59 percent of the time in environments where employees and owners interacted in a single-period setting, but only 13 percent of the time when employee-owner dyads interacted for multiple periods. Further, we calculated a proportion of lies over opportunities for each individual in the two participation conditions. The average proportion of lies to opportunities of the 14 individuals in the repeated-interaction condition with at least one opportunity to lie of 0.16 was significantly less than the average proportion of the 15 individuals with at least one opportunity to lie of 0.55 when each employee-owner dyads interacted only once ( $t = 3.39$ ,  $p < 0.01$ , two-tailed).<sup>5</sup>

## V. SUMMARY AND DISCUSSION

In this study, we investigated how the budget level assigned to the employee affects effort. We examined this relationship in a setting where employees had incentives to respond to a low budget with low effort and a high budget with high effort. Further, owners had the incentive to assign the highest budget to employees. However, we found that, consistent with reciprocity models suggesting individuals have preferences for reciprocity, many employees responded to low budgets with high effort and high budgets with low effort (i.e., a negative relationship existed between budget levels and effort) which ultimately led owners to assign lower budgets to employees.

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<sup>5</sup> These results are consistent with prior research on cheap talk demonstrating that individuals misrepresent their intentions in single-interaction settings and that this misrepresentation could ultimately lead to higher payoffs for the individual engaging in the misrepresentation (Croson et al. 2003).

We explored this relationship across four environments by manipulating whether employees and owners interacted for only a single or multiple periods and whether or not employees participated in the budget assignment process. We observed lower budgets and higher effort (i.e., stronger reciprocal behavior) when the same employee-owner dyad interacted for multiple periods when compared to dyads only interacting for a single period. Further, the effect of employee participation on the relationship between budget levels and effort depended on whether employees and owners interacted for a single or multiple periods. The effect of employee participation benefited owners when they interacted with employees for multiple periods but was detrimental to owners when they interacted with employees for only a single period.

Collectively, our results help to reconcile mixed evidence of prior research. First, our results contribute to our understanding of why lower (highly achievable) budgets are used to motivate employees in practice despite findings from experimental research suggesting that high (challenging) budgets induce higher levels of employee performance (Merchant and Manzoni 1989; Simon 1988; Van der Stede 2000). That is, this experimental research often utilized settings where employees' preference for reciprocity would play a limited role in affecting behavior (e.g., budgets often were set exogenously by the experimenter) (Locke and Latham 1990; Chow 1983; Hirst and Yetton 1999). Also, our results contribute to a better understanding of the environments in which employee participation can be beneficial or detrimental in motivating employees to make decisions beneficial to the firm.

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**Table 1**  
**Payoff Matrix for Employees and Owner by Budget Level and Effort**

<b>Effort</b>	<b>Budget</b>					
	<b>1</b>	<b>8</b>	<b>11</b>	<b>13</b>	<b>16</b>	<b>20</b>
<b>0</b>	0.00, 0.00	0.00, 0.00	0.00, 0.00	0.00, 0.00	0.00, 0.00	0.00, 0.00
<b>1</b>	4.00, (3.75)	(0.15), 0.40	(0.15), 0.40	(0.15), 0.40	(0.15), 0.40	(0.15), 0.40
<b>8</b>	3.48, (1.48)	2.60, (0.60)	(1.55), 3.55	(1.55), 3.55	(1.55), 3.55	(1.55), 3.55
<b>11</b>	3.25, (0.51)	2.37, 0.37	1.99, 0.75	(2.16), 4.90	(2.16), 4.90	(2.16), 4.90
<b>13</b>	3.09, 0.13	2.20, 1.02	1.82, 1.40	1.57, 1.65	(2.58), 5.80	(2.58), 5.80
<b>16</b>	2.83, 1.11	1.95, 1.99	1.57, 2.37	1.32, 2.62	0.94, 3.00	(3.21), 7.15
<b>20</b>	2.50, 2.40	1.62, 3.28	1.24, 3.66	0.98, 3.92	0.61, 4.29	0.10, 4.80

Payoff matrix calculated based on the parameters described in the research setting. In each cell, the first value is the payoff to the employee and the second value is the payoff to the firm owner.

**Table 2**  
**Payoff Matrix for Budget Level and Effort Provided to Experimental Participants**

<b>Effort</b>	<b>Budget</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1</b>	0.00, 0.00	0.00, 0.00	0.00, 0.00	0.00, 0.00	0.00, 0.00
<b>2</b>	3.25, (0.51)	2.37, 0.37	(2.16), 4.90	(2.16), 4.90	(2.16), 4.90
<b>3</b>	3.09, 0.13	2.20, 1.02	1.57, 1.65	(2.58), 5.80	(2.58), 5.80
<b>4</b>	2.83, 1.11	1.95, 1.99	1.32, 2.62	0.94, 3.00	(3.21), 7.15
<b>5</b>	2.50, 2.40	1.62, 3.28	0.98, 3.92	0.61, 4.29	0.10, 4.80

The above matrix was provided to experimental participants. Firm owners chose one of the five budget levels. Next, employees chose one of the five effort levels. Payoffs in each cell were pulled from the 20 budget level by 21 effort choice payoff matrix as described in the research setting (see Table 1). In each cell, the first value is the payoff to the employee and the second value is the payoff to the firm owner.

**Table 3**  
**Budget and Effort Selection across All Conditions**

*Panel A – Mean Budget and Mean Effort by Period*

<b>Period</b>	<b>N<sup>a</sup></b>	<b>Budget<sup>b</sup></b>	<b>Effort<sup>c</sup></b>	<b>Correlation</b>
1	60	2.95	3.59	-0.43 <sup>d</sup>
2	60	3.05	3.38	-0.29 <sup>e</sup>
3	60	3.21	3.28	-0.27 <sup>e</sup>
4	60	3.33	3.52	-0.36 <sup>d</sup>
5	60	2.98	3.41	-0.36 <sup>d</sup>
6	60	3.18	3.21	-0.68 <sup>d</sup>
7	60	2.97	3.30	-0.30 <sup>d</sup>
8	60	3.25	3.34	-0.27 <sup>e</sup>

*Panel B – Budget and Effort Selected All Conditions*

<b>Effort</b>	<b>Budget</b>					<b>Total</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
<b>1</b>	0	1	4	39	52	<b>96</b>
<b>2</b>	16	15	0	1	0	<b>32</b>
<b>3</b>	7	4	80	4	0	<b>95</b>
<b>4</b>	6	14	5	94	2	<b>121</b>
<b>5</b>	89	7	1	7	40	<b>144</b>
<b>Total</b>	<b>118</b>	<b>41</b>	<b>90</b>	<b>145</b>	<b>94</b>	<b>488</b>

<sup>a</sup> The number of employee/ owner dyads.

<sup>b</sup> The budget level, chosen by the owner, could take on integer values between 1 (the lowest budget level) and 5 (the highest budget level).

<sup>c</sup> The effort level, chosen by the employee after being assigned a budget, could take on integer values between 1 (the lowest effort level) and 5 (the highest effort level).

<sup>d</sup> Significant at p<.01 (two-tailed)

<sup>e</sup> Significant at p<.05 (two -tailed)

**Table 4**  
**Mean Budget Levels over the Eight Experimental Periods by Single/ Repeated-Interaction and Employee Participation Conditions, Including the Related ANOVA<sup>a</sup>**

*Panel A: Means (Standard Deviations) over All Periods for Budget Levels<sup>b</sup>*

<b>Participation<sup>d</sup></b>	<b>Interaction<sup>c</sup></b>		
	<b>Repeated</b>	<b>Single</b>	<b>Overall</b>
<b>Yes</b>	2.80 (1.11)	3.16 (0.71)	2.98 (0.93)
<b>No</b>	2.47 (0.98)	3.92 (0.27)	3.25 (1.01)
<b>Overall</b>	2.64 (1.05)	3.54 (0.65)	3.11 (0.97)

*Panel B: ANOVA on Budget Levels*

<b>Source of Variation</b>	<b>SS</b>	<b>Df</b>	<b>MS</b>	<b>F</b>	<b>p<sup>e</sup></b>
<b>Between Subjects</b>					
Interaction (I)	99.92	1	99.92	18.47	<0.01
Participation (P)	5.65	1	5.65	1.04	0.31
I × P	35.78	1	35.78	6.61	0.01
Subject (I × P)	308.39	57	5.41		
<b>Within Subjects</b>					
Period	8.90	7	1.27	0.97	0.45
Period × I	18.44	7	2.63	2.01	0.05
Period × P	22.23	7	3.18	2.42	0.02
Period × I × P	4.68	7	0.67	0.51	0.83
Period × Subject (I × P)	523.46	399	1.31		

<sup>a</sup> The budget level, chosen by the owner, could take on integer values between 1 (the lowest budget level) and 5 (the highest budget level).

<sup>b</sup> We manipulated periods as a within-subject factor with eight levels.

<sup>c</sup> We manipulated interaction as a between-subjects factor with two levels, single or repeated. Each employee either interacted with the same owner each period or interacted with a different owner each period.

<sup>d</sup> We manipulated employee participation as a between-subjects factor with two levels, employees either communicated a non-binding offer of effort in exchange for a specified budget level before the owner assigned a budget to the employee or employees could not send any communication to the owner prior to being assigned a budget level by the owner.

<sup>e</sup> The p-values are reported on a two-tail bases.

**Table 5**  
**Mean Effort over the Eight Experimental Periods by Single/ Repeated-Interaction and Participation Conditions, Including the Related ANOVA<sup>a</sup>**

*Panel A: Means (Standard Deviations) over All Periods for Effort<sup>b</sup>*

<b>Participation<sup>d</sup></b>	<b>Interaction<sup>c</sup></b>		<b>Overall</b>
	<b>Yes</b>	<b>No</b>	
<b>Yes</b>	3.84 (0.97)	2.99 (0.87)	3.40 (1.00)
<b>No</b>	3.67 (0.87)	3.08 (0.70)	3.35 (0.83)
<b>Overall</b>	3.76 (0.91)	3.04 (0.80)	3.38 (0.91)

*Panel B: ANOVA on Effort*

<b>Source of Variation</b>	<b>SS</b>	<b>Df</b>	<b>MS</b>	<b>F</b>	<b>p<sup>e</sup></b>
<b>Between Subjects</b>					
Interaction (I)	63.14	1	63.14	10.78	<0.01
Participation (P)	0.23	1	0.23	0.04	0.85
I × P	2.02	1	2.02	0.35	0.56
Subject (I × P)	333.85	57	5.86		
<b>Within Subjects</b>					
Period	5.87	7	0.84	0.57	0.78
Period × I	21.53	7	3.08	2.09	0.04
Period × P	19.38	7	2.77	1.88	0.07
Period × I × P	9.19	7	1.31	0.89	0.51
Period × Subject (I × P)	587.00	399	1.47		

<sup>a</sup> The budget level, chosen by the owner, could take on integer values between 1 (the lowest budget level) and 5 (the highest budget level).

<sup>b</sup> We manipulated periods as a within-subject factor with eight levels.

<sup>c</sup> We manipulated interaction as a between-subjects factor with two levels, single or repeated. Each employee either interacted with the same owner each period or interacted with a different owner each period.

<sup>d</sup> We manipulated employee participation as a between-subjects factor with two levels, employees either communicated a non-binding offer of effort in exchange for a specified budget level before the owner assigned a budget to the employee or employees could not send any communication to the owner prior to being assigned a budget level by the owner.

<sup>e</sup> The p-values are reported on a two-tail bases.

**Table 6**  
**Mean Owner Pay over the Eight Experimental Periods by Single/ Repeated Interaction and Participation Condition, Including the Related ANOVA<sup>a</sup>**

*Panel A: Means (Standard Deviations) over All Periods for Owner Pay<sup>b</sup>*

<b>Participation<sup>d</sup></b>	<b>Interaction<sup>c</sup></b>		
	<b>Repeated</b>	<b>Single</b>	<b>Overall</b>
<b>Yes</b>	2.29 (1.19)	1.56 (0.98)	1.91 (1.13)
<b>No</b>	1.88 (0.72)	2.21 (1.06)	2.06 (0.92)
<b>Overall</b>	2.09 (0.99)	1.89 (1.06)	1.99 (1.03)

*Panel B: ANOVA on Owner Pay*

<b>Source of Variation</b>	<b>SS</b>	<b>Df</b>	<b>MS</b>	<b>F</b>	<b>p<sup>e</sup></b>
<b>Between Subjects</b>					
Interaction (I)	4.73	1	4.73	0.58	0.45
Participation (P)	1.76	1	1.76	0.22	0.64
I × P	34.97	1	34.97	4.32	0.04
Subject (I × P)	461.84	57	8.10		
<b>Within Subjects</b>					
Period	7.11	7	1.02	0.65	0.71
Period × I	6.38	7	0.01	0.59	0.77
Period × P	11.86	7	1.69	1.09	0.37
Period × I × P	11.99	7	1.71	1.10	0.36
Period × Subject (I × P)	619.84	399	1.55		

<sup>a</sup> The budget level, chosen by the owner, could take on integer values between 1 (the lowest budget level) and 5 (the highest budget level).

<sup>b</sup> We manipulated periods as a within-subject factor with eight levels.

<sup>c</sup> We manipulated interaction as a between-subjects factor with two levels, single or repeated. Each employee either interacted with the same owner each period or interacted with a different owner each period.

<sup>d</sup> We manipulated employee participation as a between-subjects factor with two levels, employees either communicated a non-binding offer of effort in exchange for a specified budget level before the owner assigned a budget to the employee or employees could not send any communication to the owner prior to being assigned a budget level by the owner.

<sup>e</sup> The p-values are reported on a two-tail bases.

**Table 7**  
**Mean Employee Pay over the Eight Experimental Periods by Single/ Repeated-Interaction and Participation Condition, Including the Related ANOVA<sup>a</sup>**

*Panel A: Means (Standard Deviations) over All Periods for Employee Pay<sup>b</sup>*

<b>Participation<sup>d</sup></b>	<b>Interaction<sup>c</sup></b>		
	<b>Repeated</b>	<b>Single</b>	<b>Overall</b>
<b>Yes</b>	1.37 (0.71)	1.32 (0.56)	1.35 (0.62)
<b>No</b>	1.68 (0.57)	0.66 (0.58)	1.14 (0.77)
<b>Overall</b>	1.52 (0.65)	0.99 (0.65)	1.24 (0.70)

*Panel B: ANOVA on Employee Pay*

<b>Source of Variation</b>	<b>SS</b>	<b>Df</b>	<b>MS</b>	<b>F</b>	<b>p<sup>e</sup></b>
<b>Between Subjects</b>					
Interaction (I)	35.01	1	35.01	11.91	<0.01
Participation (P)	3.66	1	3.66	1.24	0.27
I × P	28.15	1	28.15	9.58	<0.01
Subject (I × P)	167.54	57	2.94		
<b>Within Subjects</b>					
Period	4.09	7	0.58	0.68	0.69
Period × I	13.33	7	1.91	2.22	0.03
Period × P	7.22	7	1.03	1.20	0.30
Period × I × P	3.88	7	0.55	0.65	0.72
Period × Subject (I × P)	341.83	399	0.86		

<sup>a</sup> The budget level, chosen by the owner, could take on integer values between 1 (the lowest budget level) and 5 (the highest budget level).

<sup>b</sup> We manipulated periods as a within-subject factor with eight levels.

<sup>c</sup> We manipulated interaction as a between-subjects factor with two levels, single or repeated. Each employee either interacted with the same owner each period or interacted with a different owner each period.

<sup>d</sup> We manipulated employee participation as a between-subjects factor with two levels, employees either communicated a non-binding offer of effort in exchange for a specified budget level before the owner assigned a budget to the employee or employees could not send any communication to the owner prior to being assigned a budget level by the owner.

<sup>e</sup> The p-values are reported on a two-tail bases.

**Table 8**  
**Mean Employees' Concern for the Owners' Payoffs by Single/ Repeated Interaction and Participation Condition, Including the Related ANOVA<sup>a</sup>**

*Panel A: Means (Standard Deviations) over All Periods for Employees' Concern for Owners' Payoffs*

<b>Participation<sup>c</sup></b>	<b>Interaction<sup>b</sup></b>		
	<b>Repeated</b>	<b>Single</b>	<b>Overall</b>
<b>Yes</b>	61.47 (6.16)	39.38 (22.94)	50.06 (20.17)
<b>No</b>	53.57 (13.79)	51.56 (13.75)	52.50 (13.57)
<b>Overall</b>	57.66 (11.11)	45.47 (19.61)	51.26 (17.14)

*Panel B: ANOVA on Employees' Concerns for Owner's Payoffs*

<b>Source of Variation</b>	<b>SS</b>	<b>Df</b>	<b>MS</b>	<b>F</b>	<b>p<sup>d</sup></b>
Between Subjects					
Reputation (R)	2207.71	1	2207.71	9.16	<0.01
Participation (P)	70.03	1	70.03	0.29	0.59
R × P	1532.97	1	1532.97	3.63	0.01
Subject (R × P)	13732.85	57	240.93		

<sup>a</sup> Employees' response to the following statement, "I was concerned about how much my group member would make each work period." Responses were collected on a Likert-type scale with "10" being "strongly disagree" and "70" being "strongly agree."

<sup>b</sup> We manipulated interaction as a between-subjects factor with two levels, single or repeated. Each employee either interacted with the same owner each period or interacted with a different owner each period.

<sup>c</sup> We manipulated employee participation as a between-subjects factor with two levels, employees either communicated a non-binding offer of effort in exchange for a specified budget level before the owner assigned a budget to the employee or employees could not send any communication to the owner prior to being assigned a budget level by the owner.

<sup>d</sup> The p-values are reported on a two-tail bases.

**Table 9**  
**Employee Lies when Participating in the Budgeting Process in the Single and Repeated-Interaction Conditions**

	<u>Opportunities to Lie<sup>a</sup></u>	<u>Lies<sup>b</sup></u>	<u>Proportion of Lies Over Opportunities</u>
<b>Repeated-Interaction</b>	64	8	0.13
<b>Single Interaction</b>	39	23	0.59

<sup>a</sup> An employee had an opportunity to lie when the owner agreed to set the budget level to the level in the employee's communication to the owner.

<sup>b</sup> An employee was deemed to have lied when the owner agreed to set the budget to the level in the employee's communication and the employee chose a different effort level than that communicated in the message.