Vertical Pay Dispersion, Peer Observability and Reporting Norms

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Abstract

In this study, we examine whether vertical pay dispersion moderates the relation between peer observability and subordinate’s misreporting behavior in an experimental setting. We extend this research on the impact of vertical pay dispersion on reporting honesty by examining the interaction between members of superior-subordinate triads (two subordinates assigned to each superior) in the presence of both vertical pay dispersion (high/low) and peer observability (present/absent). We hypothesize that peer observability shapes subordinate’s reporting norms differently depending upon different levels of vertical pay dispersion. We predict and find that when vertical pay dispersion is low, subordinates misreport less in the presence of peer observability than in its absence, whereas when vertical pay dispersion is high, subordinates misreport more in the presence of peer observability than in its absence. Furthermore, we find that when vertical pay dispersion is low, subordinates are more influenced by peers who are more (vs. less) honest than themselves and when vertical pay dispersion is high, subordinates are more influenced by peers who are less (vs. more) honest than themselves. Implications for theory and practice are discussed.

Keywords: vertical pay dispersion, peer observability, misreporting, fairness, social norms
I. INTRODUCTION

Recent public pressure for more transparent disclosure of the pay gap between top management and the average employee in public companies drives many provisions of the Dodd-Frank Act of 2010. One of these provisions is the requirement for companies to disclose the ratio of the compensation of the CEO to that of the median employee. At the same time, tournament-like pay structures have resulted in widening gaps in pay between employees at different levels in many organizations (Conyon, Peck and Sadler 2001). Thus, vertical pay dispersion, defined as the difference in pay between employees at different levels in the organizational hierarchy (Siegel and Hambrick 2005), is of particular interest to both research and practice. While Guo, Libby and Liu (2016) examine how vertical pay dispersion affects the superior-subordinate relationship, the current study examines how vertical pay dispersion affects the dynamics between subordinate employees. Such dynamics are especially important to examine in settings where peer employees can observe each other’s reporting choices.

Peer observability has become more commonplace as firms introduce more open internal reporting systems (Evans, Moser, Newman and Stikeleather 2016). In addition, many firms are adopting “open office” designs in which walls and barriers between office workers are removed facilitating subordinates’ observation of the actions of their peers (Kaufman 2014). These design and reporting system choices impact the development of social norms of behavior that influence subordinates’ willingness to report private information honestly to superiors (Hannan, Towry and Zhang 2013; Evans et al. 2016).

Social norms are defined as the informal rules of behavior that are considered acceptable and involve a shared understanding or consensus among individuals (Coleman 1990; Ostrom 2000). Peer observability is expected to make social norms of fairness and honesty particularly
relevant to subordinates’ reporting choices. When multiple social norms are applicable to a given situation, situational cues often determine which norms become salient and which dominate. We argue vertical pay dispersion is likely one such situational cue, as individuals often compare themselves with colleagues at both higher and lower ranks in the corporate hierarchy (Dornstein 1991; Brown, Ferris, Heller and Keeping 2007). Thus, we predict that vertical pay dispersion will moderate the relation between peer observability and misreporting in a budgeting context.

Prior research on misreporting in a budgeting context has investigated factors that contribute to or mitigate opportunistic misreporting in a setting similar to Evans, Hannan, Krishnan and Moser (2001) (e.g., Hannan 2005; Rankin, Schwartz and Young 2008; Hannan, Rankin and Towry 2010). In particular, Guo et al. (2016) find that vertical pay dispersion stimulates feeling of unfairness on both the superior’s and the subordinate’s part. Perceptions of unfairness result in increased misreporting by subordinates and reduced willingness of the superior to exert control over subordinate misreporting. In this study, we expand on the setting in Guo et al. (2016) by examining, via peer observability, the dynamics between subordinates who report to the same superior. Thus, we expect subordinates’ reporting choices to be affected by both vertical pay dispersion and by observing the reporting choices of their peers.

Specifically, we expect that a peer’s reporting behavior will have a different impact on the subordinate’s reporting choices depending on the level of vertical pay dispersion. When vertical pay dispersion is low, the relative pay structure will be considered to be fair (Guo et al. 2016; Yu and Luu 2016; Kelly and Seow 2016). Peer observability will increase the pressure to comply with social norms of honesty and fairness since subordinates are likely to share the expectation that higher reporting honesty is appropriate. Thus, subordinates’ reporting behaviors will be more influenced by their more honest peers, suggesting there will be less misreporting in
the presence of peer observability than in its absence. However, when vertical pay dispersion is high, we expect subordinates will view the relative pay structure to be unfair. In the presence of peer observability, subordinates are more likely to consider peers’ misreporting as norm-complying and justifiable. Consequently, when vertical pay dispersion is high, we predict that subordinates’ reporting behaviors will be more influenced by their less honest peers, leading to greater misreporting when peer observability is present than when it is absent.

We test our predictions using a 2 (vertical pay dispersion high/low) x 2 (peer observability present/absent) x 8 (periods) mixed factorial experiment where participants are assigned the role of superior or subordinate based on their performance on a cognitive task. We manipulate vertical pay dispersion by varying the fixed wage paid to the superior and the subordinates. The subordinates are always paid a $10 fixed wage and the superior is paid a fixed wage of either $12 (low pay dispersion) or $25 (high pay dispersion). We manipulate peer observability by revealing (peer observability present) or withholding (peer observability absent) to subordinates the actual project costs and cost reports of their peers.

Participants (one superior paired with two subordinates) interact anonymously via networked computers and are randomly re-paired each period. Subordinates receive private information about the actual cost of a capital project and report to the superior a cost budget that can be higher than the actual cost. Subordinates are allowed to submit cost reports twice, once before observing the peer’s actual cost and cost report (when peer observability is present) and one after, and only the final submission bears economic consequences. Superiors set a cost threshold representing the maximum cost report they are willing to accept from the subordinates. Any proposal with a reported cost at or below the threshold is accepted and the subordinate
retains the cost surplus, i.e., the difference between actual and reported cost, if any. If the cost report is rejected, the project goes unfunded and the subordinate receives only the fixed wage.

As predicted, we find an interactive effect of vertical pay dispersion and peer observability on subordinates’ reporting behaviors. Specifically, when pay dispersion is low, subordinate misreporting is lower with peer observability than without it, and more honest peer reports have a greater influence on subordinate misreporting choices than less honest peer reports. When pay dispersion is high, we find that subordinates misreport significantly more in the presence of peer observability than in its absence, and subordinates’ reports are more influenced by less honest peer reports than more honest peer reports. Supplemental analysis indicates subordinates’ misreporting decisions are affected by concerns for fairness, but not by their strategic considerations (i.e., the threshold choices made by the superiors).

This study makes the following contributions. First, this study extends the growing accounting literature on social norms (e.g., Tayler and Bloomfield 2011; Davidson and Stevens 2013). While extant literature demonstrates that social norms can affect individual behavior, our findings suggest that different budgeting norms can develop from different control systems, which in turn have different profit implications for the organization. Second, we contribute to both budgeting research and practice by identifying the interactive effect of an incentive design feature (i.e., vertical pay dispersion) and an information policy feature (i.e., peer observability). While Guo et al. (2016) show that vertical pay dispersion affects individual reporting honesty, this study demonstrates that vertical pay dispersion, via peer observability, affects group reporting dynamics. We predict and find that when vertical pay dispersion is low, subordinates misreport less in the presence of peer observability than in its absence, whereas when vertical pay dispersion is high, subordinates misreport more in the presence of peer observability than in
its absence. Furthermore, we find that when vertical pay dispersion is low, subordinates are more influenced by peers who are more (vs. less) honest than themselves and when vertical pay dispersion is high, subordinates are more influenced by peers who are less (vs. more) honest than themselves. Specifically, we illustrate how a “climate of injustice or justice” could lead to employees’ deviant behaviors (Priesemuth, Schminke, Ambrose and Folger 2014). Accordingly, our findings suggest that firms should align their information policy (e.g., peer observability) with their incentive structures to achieve a more positive budgeting environment.

The remainder of this paper is organized as follows. In the next section, we describe our research setting, review the literature and develop our hypotheses. In section III, we describe our experimental method, followed by a report of our results in section IV. Finally, we conclude with a discussion of our results and implications for research and practice in section V.

II. Literature Review and Hypotheses

Setting

We adapt the setting from Guo et al. (2016) to a multi-agent context, where two subordinates each propose an investment project to one superior for funding. Project revenue and the probability distribution of actual costs is commonly known by both the superior and the subordinates, while only the subordinates know the actual cost of their own proposed project. The superior solicits a cost report or ‘budget’ from the subordinates, who hold private information about the actual cost. As we are interested in the effect of peer observability on subordinates’ reporting honesty, we allow subordinates to submit to the superior an initial and a final cost report. When peer observability is present, subordinates can observe their peer’s actual project cost and initial cost report, so they can infer their peer’s initial degree of reporting
(dis)honesty. This information is likely to affect a subordinate’s final reporting decision. Only the final cost report is sent to the superior and considered for project funding purpose.

We adopt the strategy method such that the superior sets a maximum threshold level that applies to both subordinates before receiving their cost reports (Rankin et al. 2008; Hannan et al. 2010). The threshold is not revealed to the subordinate and project proposals above the threshold are rejected. If a reported project cost is below or at the threshold, then the project proposal is accepted and the subordinate retains any surplus (i.e., the difference between the reported project cost and the actual project cost). Subordinates and superiors interact anonymously in triads and no triad is ever repeated; thus, there are no reputational concerns. As in Guo et al. (2016), subordinates receive a fixed wage plus any budget surplus from projects accepted for funding and superiors receive a fixed salary wage.\(^1\)

**Vertical pay dispersion**

According to prior literature (e.g., Siegel and Hambrick 2005), vertical pay dispersion is defined as the difference in pay across different hierarchical levels within the organization. Vertical pay dispersion arises from variations in skill or responsibility, or due to differences in labour markets for these jobs (Gupta, Conroy and Delery 2012; Brown, Sturman and Simmering 2003). Bloom and Michel (2002) suggest that some reasonable amount of vertical pay dispersion may be necessary to attract, retain and motivate high-performing employees. Even so, vertical pay dispersion can also come at the cost of perceived unfairness on the employee’s part (Pfeffer and Langton 1993; Bloom 1999).

According to equity theory (Adams 1965; Walster, Berscheid and Walster 1973; Homans 1974), individuals judge fairness by comparing the inputs they contribute and the outcomes they

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\(^1\) We note that fixed-pay contracts are also prevalent in practice (e.g., Fehr and Gachter 2000), especially for positions that require high levels of specific skills (MacLeod and Parent 1999; Yang 2008).
obtain. Nevertheless, employees’ fairness perceptions are affected largely by outcome (instead of input) differences (Cowherd and Levine 1992) for the following reasons. Considerable differences in inputs (e.g., skill and experience) exist across hierarchical ranks, and as such, comparison of inputs is less straightforward. In contrast, outcome differences such as pay and performance are observable and relatively more objective. Furthermore, self-serving biases usually make the input comparison ambiguous. Hence, subordinates are likely to perceive high vertical pay differences as unfair, which in turn reduces their motivation and increases opportunistic behaviors.

**Social Norms**

Reporting decisions in budgetary settings can be influenced by social norms (Douthit and Stevens 2015; Huddart and Qu 2016). Social norms are the informal rules of behavior that are considered acceptable in a group and social norms often involve a shared understanding or consensus among a group of rational individuals (e.g., Coleman 1990; Ostrom 2000). Bicchieri (2006) argues that individuals have conditional preferences for conforming to a social norm. That is, individuals prefer to follow a social norm if they expect others will comply with the norm (*empirical expectations*) and believe that others expect them to follow the norm (*normative expectations*) (Bicchieri and Chavez 2010). Empirical expectations or normative expectations will increase behavior consistent with the norm (Blay, Gooden, Mellon and Stevens 2016). Prior research in budgetary reporting suggests that the opportunity for subordinates to observe each other’s reporting behavior (i.e., peer observability) can facilitate the convergence of reporting norms toward more or less honest behavior (e.g., Evans et al. 2016).

There is often uncertainty regarding what norm is applicable in a given situation (e.g., Schram and Charness 2015; Danilov and Silwka 2016). In our setting, we identify that at least
two social norms will affect individual reporting behaviors, specifically, honesty and distributional fairness. We define the social norm for honest reporting as a preference that causes disutility from making false statements (Rankin et al. 2008; Douthit and Stevens 2015). Consistent with prior research, we define the distributional fairness social norm as a preference for equitable distribution of outcomes (Douthit and Stevens 2015; Fehr and Schmidt 1999). When multiple social norms are applicable to a given situation, situational cues often determine which norm(s) become salient or dominant (Hannan et al. 2013; Bicchieri 2006). Vertical pay dispersion is likely one such situational cue.

**Hypotheses Development**

When vertical pay dispersion is low, we predict that subordinates are likely to report more honestly when they can observe their peer’s reporting behavior than when they cannot. First, if a subordinate’s reporting decisions can be observed by his/her peer, then the subordinate likely believes that others expect compliance with the social norm of honest reporting. Individuals tend to avoid publicly breaking a social norm since the violation of a social norm, if known by others, often causes guilt or shame (Bicchieri 2006; Ostrom 2000). If a subordinate’s cost reports are not revealed to his/her peer, then the subordinate can evade the honesty norm and instead, may overstate project costs to increase his/her own financial payoff. Consistent with this argument, Maas and Van Rinsum (2013) find that performance overstatement is lower when individual reporting decisions are publicly announced than when they are not.

Second, when a subordinate’s reporting decision is observed, the distributional fairness norm likely reduces a subordinate’s willingness to misreport. When vertical pay dispersion is low, subordinates are more likely to perceive their compensation relative to their superiors’ compensation as fair (Fehr and Schmidt 1999); thus, creating a greater amount of slack through
dishonest cost reports would be viewed as distributionally unfair to superiors (Guo et al. 2016). Bicchieri and Chavez (2010) propose that individuals tend to follow the distributional fairness norm in the presence of its expectation, but disregard it in its absence. Therefore, a subordinate likely builds less (more) reporting slack in the presence (absence) of peer observability, since the fairness-compliance expectation is not present when peer reports are not observable.

Third, the honest reporting norm and the distributional fairness norm are congruent when vertical pay dispersion is low as compliance with either norm requires more honest reporting (i.e., less slack). In the presence of peer observability, a subordinate likely expects that his/her peer will conform with these pro-social norms. When a subordinate finds that the peer reports more honestly, the subordinate is more likely to conform to the demonstrated social norm by also reporting more honestly (Bicchieri 2006). In summary, peer observability accentuates the salience of both the honesty and the fairness norms when vertical pay dispersion is low, both of which lead to less misreporting by subordinates.

H1a: When vertical pay dispersion is low, subordinate misreporting will be lower when they can observe one another’s reporting decisions than when they cannot.

When vertical pay dispersion is high, we predict that subordinates report less honestly when they can observe each other’s cost reports than when they cannot. First, subordinates often perceive high vertical pay dispersion to be unfair or inequitable (Fehr and Schmidt 1999; Guo et al. 2016). In the presence of peer observability, subordinates may therefore find each other’s cost overstatements justifiable and fair. Moral disengagement theory (Bandura, 1990, 1999, 2002) argues that individuals act opportunistically when they can disengage moral responsibility by self-justifying their dishonest actions. After observing each other’s overstatements, subordinates would be more able to justify their own overstatements because their peers are doing the same. Hannan et al. (2013) find that when subordinates are inclined to collude with one another, peer
observability facilitates such collusion and reduces effort. The ease of self-justifying misreporting under peer observability will thus amplify cost overstatement.²

Second, while subordinates will continue to experience normative pressure to appear honest in the presence of peer observability, this pressure is likely dominated by the fairness norm when vertical pay dispersion is high. While the honesty norm suggests lower misreporting, the fairness norm dictates the exact the opposite. When conflicting norms are present and there is ambiguity about the appropriate behavior, individuals are more likely to act in their own self-interest (Dierynck and Roodhooft 2011; Gaertner, Sedikides, Vevea and Iuzzini 2002; Rowe 2004; Tayler and Bloomfield 2011). In our setting, subordinates likely redress perceived distributional unfairness caused by high vertical pay dispersion by misreporting to a greater degree. Peer observability makes evident the financial interests shared between subordinates (i.e., cost overstatement increases their financial payoffs). Church, Hannan and Kuang (2012) find that managers misreport more if the financial benefit of misreporting can be shared with non-reporting employees. The common financial interests become salient when subordinates can observe each other’s reports, thus they likely expect each other to overstate costs. In the presence of a high vertical pay dispersion, when subordinates find their peers’ reports include greater slack, subordinates are more likely to conform by overstating more (Bicchieri 2006).

Third, when peer reports are observable, superiors likely believe that subordinates will report in concert, thus, their expectation will be that misreporting by both subordinates will be higher when vertical pay dispersion is high.³ Therefore, superiors experience greater pressure to

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² We recognize that moral disengagement theory could also apply when vertical pay dispersion is low. Even so, we expect significantly less misreporting in general in that case and thus, the impact of moral disengagement on misreporting should be correspondingly low.

³ While superiors may also expect that peer observability enables subordinates to report in concert when vertical pay dispersion is low, they do not face the incrementally greater pressure of increasing the cost threshold (Guo et al. 2016). This is because low vertical pay dispersion offers limited social pressure for subordinates to increase reporting slack to the relative disadvantage of superiors.
tolerate higher reporting slack when peer observability is present than when it is absent. To avoid excessive rejection of project proposals, superiors may set relatively higher thresholds (Guo et al. 2016). From a strategic interaction perspective, peer observability may empower subordinates to overstate project costs to a greater extent. These expectations are stated formally in the following hypothesis:

**H1b:** _When vertical pay dispersion is high, subordinate misreporting will be greater when they can observe on another’s reporting decisions than when they cannot._

Individuals’ norm activation partly depends on the behavior of their peers, i.e., what others do in a given situation (Bicchieri 2006; Huddart and Qu 2016). In our setting, subordinates can observe what their peers _actually_ do only in the presence of peer observability. Therefore, we focus next on how subordinates respond to peer reporting decisions when these decisions are observed by their peers.

We expect that peer overstatements will asymmetrically affect subordinate misreporting depending on the degree of vertical pay dispersion. When vertical pay dispersion is low, both honesty and fairness norms dictate less misreporting. If a peer misreports less (more), a subordinate will consider it (not) congruent with normative expectations. Hence, a subordinate will likely align his/her reporting decisions with the more honest peer reports than with less honest peer reports. In comparison, subordinates likely consider high vertical pay dispersion as violating the distributional fairness norm, and thus greater peer misreporting as fair and confirming a high-slack reporting norm. So, the subordinate will likely misreport more when his/her peer misreports more, and disregard his/her peer’s report if these reports are more honest. In sum, when peer reports are observable, a subordinate’s reporting decisions are affected to a greater extent by more honest peer reports when vertical pay dispersion is low and more dishonest peer reports when vertical pay dispersion is high.
H2a: *When vertical pay dispersion is low and peer’s behavior is observable, subordinates’ cost reports will be affected to a greater extent by more honest peer reports than less honest peer report.*

H2b: *When vertical pay dispersion is high and peer’s behavior is observable, subordinates’ cost reports will be affected to a greater extent by less honest peers report than more honest peer reports.*

### III. Method

**Design**

To test our hypotheses, we conduct a laboratory experiment using a 2 X 2 X 8 mixed factorial design. The 2 X 2 between-subject factors include vertical pay dispersion (low vs. high) and peer observability (absent vs. present). Vertical pay dispersion is manipulated at two levels, specifically ratios of superior to subordinate fixed pay of $12:$10 (“low pay dispersion”) and $25:$10 (“high pay dispersion”). The subordinates’ fixed pay remains constant between conditions so that the initial economic incentives are held constant across conditions. Peer observability is also manipulated at two levels. In the “peer observability absent” condition, subordinates cannot observe their peers’ actual project cost or any reported project costs, while in the “peer observability present” condition, subordinates are able to observe their peers’ actual project cost and both the initial and final reported costs. Period (1-8) is a within-subject repeated factor such that within an experimental session, participants complete 8 decision periods. The experiment is programmed and conducted using z-Tree software (Fischbacher 2007).

The dependent measure used in this study is subordinates’ cost overstatement, \( OVERSTATE \). Following prior literature, we measure overstatement as slack taken/slack available (e.g., Evans et al. 2001; Church, Hannan and Kuang 2012; Newman 2014). The slack taken is the amount of slack in the project budget, calculated as the difference between the
subordinate’s reported project cost and the actual project cost. The slack available is calculated by taking the difference between the highest possible cost ($40 in our setting) and the actual cost.

Each session consists of a unique experimental treatment condition with eight periods. Before starting a session, we randomly assign one of the four experimental conditions to that session. One third of participants are assigned the role of “superior” and two thirds the role of “subordinate” based on their performance on a cognitive task unrelated to the cost reporting task. All participants remain in the same role throughout the session.

Two design choices are implemented to control for potential reputation effects. First, participants know their superior and peer are in the room, but they do not know their identity. Second, participants are aware that members of each superior-subordinate triad are re-paired each period and no one will be assigned to the same triad more than once. In addition to mitigating potential reputation effects between superior and subordinates, these design choices also allow us to avoid the development of reciprocity concerns among subordinate participants.

**Participants, Procedures and Task**

A total of 93 participants are recruited from upper-level accounting courses at a large public university. On average, participants are 24 years of age, have 4.72 years of work experience and 48% are female. Each participant completes two tasks in an experimental session. In Task 1, participants are given four minutes to answer five multiple-choice questions adapted from the graduate management admission test (GMAT). Their performance is ranked based on the number of questions they answer correctly. The top one-third of participants in a session are assigned to be superiors, and the remaining participants are assigned to be subordinates. The assignment of the role is in line with how these assignments are often made in practice where performance and/or merit are considered in promotion decisions.
Next, the experimenter reads aloud the instructions for Task 2 and participants complete a quiz that tests their understanding of the instructions. The quiz includes 11 questions about the key components of the instructions, such as the participant’s role, anonymity, the determination of actual, reported and threshold cost, and earnings calculation. Once all participants answer all quiz questions correctly, they begin three practice periods in which decisions do not affect their final payoffs, followed by eight formal decision periods.

In each period, subordinates first learn the actual cost of the project which is determined randomly in advance. It is public knowledge that the actual project cost follows a uniform distribution of ($1, $2, $3 .... $40). To facilitate comparison across experimental conditions, we randomly selected two actual cost sequences (one sequence for each subordinate in the dyad) from the possible project costs using a random number generator in Excel. We used these two cost sequences in all experimental conditions. After learning the actual project cost, subordinates then submit an initial cost report to the superior, which cannot be less than the actual project cost nor greater than the maximum possible actual cost of $40.

After submitting the initial cost report, subordinates are given a chance to revise the reported cost and submit a final cost report. In the peer observability present condition, subordinates can observe their peer subordinate’s actual cost and initial cost report before submitting their final cost report, while in the peer observability absent condition, subordinates cannot observe this information. Only the final cost report (and not the initial cost report) is submitted to the superior for funding purposes. In the meantime, superiors are required to set a threshold cost before observing the cost reports from either subordinate. If the subordinate’s final reported cost of the project is higher than the threshold cost, the project is rejected; otherwise, it

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4 In order, the actual costs presented to one subordinate are 13, 28, 8, 14, 25, 5, 33 and 7, whereas those presented to the other subordinate are 17, 22, 6, 18, 27, 3, 29 and 10.
is accepted. The subordinate is never informed of the threshold cost and projects are funded at the final reported cost, not the threshold cost.

This process is repeated over three practice periods and eight formal decision periods. After each period, all participants receive feedback on the funding decisions and related outcomes. In the peer observability present condition, subordinates also find out the actual cost and final reported cost of their peer subordinates. Then all participants complete a post-experimental questionnaire which includes manipulation checks, participants’ perceptions of various aspects of the task and demographic questions. At the end of each experimental session, participants are paid privately and in cash.

**Payoffs**

Participants’ payoffs consist of earnings from both Task 1 and Task 2. In Task 1, participants receive $1 for each GMAT question they answer correctly. In Task 2, superiors’ earnings only include a fixed salary of $12 ($25) in the low (high) pay dispersion condition. Subordinates’ earnings include a fixed salary ($10) and the surplus retained (i.e., the difference between actual project cost and final reported cost), if any. Although superiors’ earnings are fixed, superiors are instructed that they are responsible for setting the threshold cost on behalf of the firm and to maximize the firm’s project profit, which is the difference between the project revenues of $40 and subordinates’ final reported cost. This design feature allows us to impose an identical objective function on superiors across all experimental conditions. Such an objective function also reflects superiors’ fiduciary role in actual companies.

Participants receive an average cash payment of $1.45 from Task 1, with a range from $0 to $5. On average, superiors received $3.65, and subordinates received $0.32 from this task. In Task 2, subordinates receive an average cash payment of $18.66, ranging from $10 to $34.
Superiors received an average cash payment of $18.71, resulting in an overall average cash payment of $18.68 for all participants.

IV. RESULTS

Manipulation and Comprehension Checks

We test participants’ comprehension of the vertical pay dispersion manipulation by asking them to indicate both the superior’s and the subordinates’ fixed salaries. All participants correctly answered these questions. We also measure participants’ perceived magnitude of vertical pay dispersion by asking “In your opinion, the salary difference between the superior and the subordinates was ___ (1: too small; 10: too big).” The average response from the subordinate participants is significantly higher in the high (mean=6.56, sd=1.46) than in the low (mean=3.73, sd=1.86) vertical pay dispersion conditions (F-ratio=44.87, p<0.01) indicating that our manipulation of vertical pay dispersion was successful. We use the following question to examine the effectiveness of the manipulation of peer observability: “Over the eight decision periods, were you shown the reported costs of your peer subordinate in your triad?” All but three participants answered this question correctly.5

Hypotheses Tests

Tests of H1a and H1b

In testing H1a and H1b, we focus on subordinates’ overstatement using their final cost reports, labelled F-OVERSTATE. This is because the subordinates’ final, but not their initial, reporting decisions carry real economic consequences. H1a posits that peer observability decreases overstatement when vertical pay dispersion is low, while H1b predicts that peer

5 These three participants are all in the peer-observability-absent conditions. Since in the peer-observability-absent conditions the subordinates were not shown their peers’ cost reports, we included these three subordinates’ data in the analyses. However, excluding these participants from our analysis does not change our inferences.
observability increases overstatement when vertical pay dispersion is high. Table 1 Panel A presents the descriptive statistics, and Figure 1A provides the average $F$-OVERSTATE across the four treatment conditions. In the low vertical pay dispersion condition, the average (median) of subordinates’ $F$-OVERSTATE across eight periods is 37.28% (32.84%) when they cannot observe their peers’ reporting decisions, and 28.39% (26.97%) when they can. In the high vertical pay dispersion condition, the average (median) of subordinates’ $F$-OVERSTATE across eight periods is 29.96% (25.46%) when they cannot observe their peers’ reporting decisions, and 43.40% (40.27%) when they can. These results are consistent with both H1a and H1b.

[INSERT TABLE 1 AND FIGURE 1 ABOUT HERE]

We formally test H1a and H1b using a repeated-measure ANOVA with period as the within-subject factor, and pay dispersion and peer observability as the between-subjects factors. Results are presented in Table 2 Panel A. Consistent with the pattern presented in Table 1 and Figure 1A, the results of the repeated-measures ANOVA indicate a significant interaction effect on $F$-OVERSTATE ($F = 7.58, p<0.01$). Figure 1B presents the mean of $F$-OVERSTATE by period. In the low vertical pay dispersion condition, the subordinates’ average $F$-OVERSTATE is consistently lower across periods when they can observe each other’s reporting decisions than when they cannot; the results reverse when vertical pay dispersion is high, i.e., the average $F$-OVERSTATE is consistently higher across periods with peer observability than without peer observability.

[INSERT TABLE 2 ABOUT HERE]

We further conduct simple effects tests and compare $F$-OVERSTATE within each of the vertical pay dispersion condition. The results are presented in Table 2 Panel B. As reported, $F$-OVERSTATE is marginally lower with peer observability than without peer observability when
vertical pay dispersion is low (F-ratio=2.63, p=0.06, one-tailed), whereas it is significantly higher with peer observability than without peer observability when vertical pay dispersion is high (F-ratio=5.13, p=0.02 one-tailed). These results, again support both H1a and H1b.

Consistent with H1a and H1b, we predict that peer observability encourages subordinates to overstate less in the low vertical pay dispersion condition, and to overstate more in the high vertical pay dispersion condition. To further examine how overstatement changes between initial and final cost reports, we construct a variable, $\Delta OVERSTATE$, by taking the difference in overstatement between a subordinate’s initial cost submission and his/her final cost submission. This variable measures the change in reporting honesty, and captures the peer influence arising from observing the peer’s reporting behavior and from the subordinate’s own reporting behavior being observed by the peer. Table 1 Panel B reports the descriptive statistics for $\Delta OVERSTATE$ across treatment conditions.

When vertical pay dispersion is low, the average $\Delta OVERSTATE$ is not significantly different from zero when peer reports are not observable (-0.32%, p=0.42), but it is significantly negative when subordinates can observe each other’s reporting decisions (-4.60%, p<0.01). This result is consistent with H1a that peer observability decreases misreporting when vertical pay dispersion is low. In the high vertical pay dispersion condition, the average $\Delta OVERSTATE$ is not significantly different from zero when peer reports are not observable (-0.15%, p=0.72), whereas it is significantly positive when peer reports are observable (3.93%, p=0.01). This result is in line with H1b that peer observability increases misreporting when vertical pay dispersion is high.

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6 When subordinates cannot observe each other’s reporting decisions, it is conceivable that subordinates will make little change in their reports between the initial and the final cost submissions. As expected, $\Delta OVERSTATE$ is not significantly different from zero in either low or high pay dispersion conditions.
To formally test the significance of these differences, we run a repeated-measures ANOVA with $\Delta OVERSTATE$ as the dependent variable, vertical pay dispersion and peer observability as the between-subjects factors, and period as the within-subject factor. Results are presented in Table 3 Panel A. Similar to the pattern observed for $F-OVERSTATE$ (Table 2 Panel A), Table 3 Panel A reveals a significant interaction between vertical pay dispersion and peer observability on $\Delta OVERSTATE$ ($F = 4.92, p=0.03$). Simple effects analyses, as presented in Table 3 Panel B, show that peer observability reduces cost overstatement ($F$-ratio=4.12, $p=0.03$, one-tailed) in the low vertical pay dispersion condition while it marginally increases cost overstatement ($F$-ratio=1.77, $p=0.10$, one-tailed) in the high vertical pay dispersion condition. Again, these results are consistent with both H1a and H1b.8

Tests of H2a and H2b

H2a and H2b posit that when subordinates can observe their peers’ reporting decisions, the peer’s reporting honesty, or their lack of reporting honesty, will affect subordinates’ reporting decisions in an asymmetric manner. Specifically, we predict that when vertical pay dispersion is low (high), the subordinates will be more influenced by peers who are more (less) honest than themselves. To test these hypotheses, we focus on the peer observability present condition, because subordinates are subject to peer influence only when they can observe each other’s reporting decisions. We construct the following regression model:

$$Δ OVERSTATE = \beta_1*PMORE-HONEST*PDIFF + \beta_2*PLESS-HONEST*PDIFF +PERIOD$$

7 We note that $DISPERSION$ is also significant in this analysis ($F = 5.33, p=0.02$). But the interpretation of the main effect is of little value when the interaction term is significant (e.g., Cox 1984).

8 We measure in the post-experiment questionnaire subordinates’ estimated percentage of peers overstating costs ($OVERSTATE_{PEER\%}$). Specifically, subordinates respond to the question of “by your estimation, roughly what % of your peer subordinates overstated their project costs (choose a number between 10% and 100%).” Untabulated ANOVA results show that peer observability decreases (increases) $OVERSTATE_{PEER\%}$ when vertical pay dispersion is low (high). This result again supports H1a and H1b.
where $\Delta OVERSTATE$ is as defined above. Consistent with Huddart and Qu (2014), we define $PDIFF$ as the difference in the overstatement between the peer and the focal subordinate in their initial cost reports. $PMORE$-HONEST is defined as 1 if $PDIFF<0$, and 0 otherwise; and $PLESS$-HONEST is defined as 1 if $PDIFF>0$, and 0 otherwise. We also include the period fixed effect ($PERIOD$). We estimate the above regression model for the low vertical pay dispersion condition and the high vertical pay dispersion condition, separately. Following H2a, we predict $\beta_1$ to be significantly positive and $\beta_2$ to be insignificant when vertical pay dispersion is low. In comparison, we predict $\beta_2$ to be significantly positive and $\beta_1$ to be insignificant when vertical pay dispersion is low (H2b).

The regression results are presented in Table 4. When vertical pay dispersion is low, the interaction term $PMORE$-HONEST*$PDIFF$ is significantly positive ($\beta=0.60$, $t=6.60$, $p<0.01$), but $PLESS$-HONEST*$PDIFF$ is insignificant ($\beta=0.02$, $t=0.18$, $p=0.86$). Consistent with H2a, this result suggests that the subordinate’s final report is sensitive to his/her peer’s initial reporting honesty when the peer is more honest, but not when the peer is less honest. When vertical pay dispersion is high, we find the opposite to be the case, that is, $PLESS$-HONEST*$PDIFF$ is significant ($\beta_1=0.49$, $t=4.38$, $p<0.01$), but $PMORE$-HONEST*$PDIFF$ is not ($\beta_2=0.01$, $t=0.07$, $p=0.94$). This result suggests that when the peer’s initial report is more dishonest, the subordinate follows suit and reports less honestly in his/her final report, supporting H2b.

[INSERT TABLE 4 ABOUT HERE]

Supplemental Analyses

We conduct a few more supplementary analyses to examine the underlying mechanisms driving results within the peer observability present condition. First, we have previously argued that subordinates are motivated to reduce the perceived pay inequity between themselves and
their superiors, if any. Hence, we first examine their distributional unfairness concerns. Second, superiors’ decisions can determine whether subordinates’ reports are approved or not. Thus, we examine the superiors’ threshold decisions across treatment conditions.

**Subordinates’ Distributional Fairness Concerns**

The subordinate’s concern for distributional unfairness, labelled $UNFAIRNESS$, is measured using a post-experiment questionnaire (PEQ) question. Specifically, participants indicate the extent to which they agree with the statement that “I felt a sense of unfairness about my pay relative to my superior (1: strongly disagree; 10: strongly agree).” Table 5 Panel A presents the mean and median values of $UNFAIRNESS$ by experimental condition. When vertical pay dispersion is low, $UNFAIRNESS$ is lower with peer observability than without it (mean = 2.86 versus 4.00). In contrast, when vertical pay dispersion is high, $UNFAIRNESS$ is higher with peer observability than without it (mean = 6.25 versus 5.19). To test the difference more systematically, we conduct an ANOVA with $UNFAIRNESS$ as the dependent variable, and vertical pay dispersion and peer observability as the independent variables. Table 5 Panel B presents the results. There is a marginally significant interaction between $DISPERSION$ and $OBSERVABILITY$ (F-ratio=2.98, p=0.09). This result is consistent with the findings on $F-OVERSTATE$, suggesting that concerns for distributional unfairness at least partly influence subordinates’ misreporting decisions.

[INSERT TABLE 5 ABOUT HERE]

**Superiors’ Threshold Decisions**

Each superior makes a threshold decision ($THRESHOLD$) every period prior to receiving cost reports from the two subordinates. The threshold determines the maximum reported cost, below which a subordinate can receive funding for a proposed project. Table 6 Panel A presents
the mean and median of $THRESHOLD$ across treatment conditions. As reported, when vertical pay dispersion level is low, the mean (median) of $THRESHOLD$ is $30.86$ ($30$) in the absence of peer observability and $28.13$ ($30$) in its presence. When vertical pay dispersion level is high, the mean (median) of $THRESHOLD$ is $29.34$ ($30$) in the absence of peer observability and $32.05$ ($32$) in its presence. Panel B provides the repeated-measures ANOVA results. As shown, the interaction effect is insignificant (F-ratio=1.99, p=0.17). Simple effect analyses (untabulated) indicate no effect of peer observability on $THRESHOLD$ in either the low (F-ratio=0.71, p=0.42) or the high (F-ratio=1.57, p=0.23) vertical pay dispersion conditions. Therefore, superiors’ threshold decisions cannot account for subordinates’ misreporting behaviors across treatment conditions.

[INSERT TABLE 6 ABOUT HERE]

**Project Profit Analysis**

We next examine the effect of pay dispersion and peer observability on project profit ($PROFIT$). Similar to Rankin et al. (2008), we define $PROFIT$ as the difference between the project revenue ($40$) and the subordinate’s reported project cost; it thus captures the residual earnings a firm derives from projects that are funded. Project profit is jointly determined by both subordinates’ reporting decisions and the superior’s $THRESHOLD$ decisions. Specifically, project profit decreases with subordinates’ cost overstatement as long as the reported cost is less than the $THRESHOLD$ level chosen by superiors. As shown in Table 7 Panel A, under low vertical pay dispersion condition, the mean (median) of $PROFIT$ is $23.28$ ($24$) in the absence

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9 Guo et al. (2016) find that, driven by inequity aversion, superiors on average set more lenient cost thresholds when vertical dispersion is high compared with when it is low. Different from Guo et al. (2016), we do not find a main effect of $DISPERSION$ on $THRESHOLD$ (F-ratio=0.25, p=0.62) when subordinates cannot observe each other’s reporting decisions. One possible reason for that is our design includes two (rather than one) subordinates reporting to the same superior. As suggested by Hannan et al. (2010), superiors derive greater utility for enforcing honesty norms when their span of control increases. Superiors likely feel they have greater power when vertical pay dispersion is high than low, and thus enforce social norms more conscientiously by setting a lower threshold.
of peer observability and is $27.61 ($30) in its presence. Under high vertical pay dispersion condition, the mean (median) of PROFIT is $28.47 ($28) in the absence of peer observability and $23.55 ($22) in its presence. Panel B provides repeated-measures ANOVA analyses for PROFIT. We find a significant interaction effect between pay dispersion and peer observability on PROFIT (F-ratio=6.95, p=0.01). Simple effect analyses (untabulated) further suggest that when pay dispersion is high, peer observability reduces PROFIT significantly (F-ratio=6.86, p=0.02, two-tailed), whereas when pay dispersion is low, the effect of peer observability on PROFIT is insignificant (F-ratio=2.05, p=0.18, two-tailed).

[INSERT TABLE 7 ABOUT HERE]

V. DISCUSSION

This study finds that vertical pay dispersion moderates the relation between peer observability and subordinates’ reporting honesty in a resource allocation setting. We present evidence to indicate that when vertical pay dispersion is high, subordinates who can observe the actual cost and the cost reports of their peers misreport more than those who cannot. When vertical pay dispersion is low, the opposite is the case. That is, subordinates report more honestly when peer observability is present than when it is absent. In the presence of peer observability, we find when pay dispersion is low (high), subordinates’ reporting decisions are more sensitive to more (less) honest reporting behaviors of their peers. These results suggest that peer observability contributes to different reporting norms depending on different levels of vertical pay dispersion. That is, peer observability breeds a dishonest reporting norm when vertical pay dispersion is high, whereas it cultivates an honest reporting norm when vertical pay dispersion is low. Our supplementary analyses also suggest that our results are, at least partially, driven by subordinates’ concerns for distributional unfairness rather than their strategic concerns.
This paper contributes to the literature in several important ways. First, we identify peer observability as an important control mechanism in shaping budgeting norms. While peer observability can exacerbate reporting dishonesty when vertical pay dispersion is high, interestingly, it can facilitate greater reporting honesty when vertical pay dispersion is low. Therefore, our findings provide a more nuanced understanding of the interaction between a firm’s incentive system and its information policy in affecting corporate budgeting culture.

Second, while Guo et al. (2016) focus primarily on interaction in a superior-subordinate reporting dyad, we investigate the interplay of a reporting triad consisting of one superior and two subordinates. Our findings thus shed light on how different reporting norms arise from different institutional settings. We extend Guo et al. (2016) by examining how both vertical and lateral social comparisons interactively shape reporting norms.

Our results also suggest several avenues for future research. First, we chose to examine a setting consistent with the idea of mutual monitoring. Thus, in our triad setting, subordinates are not provided opportunities to communicate with each other. In practice, such communication can be important in channeling peer influence and forming social norms. Communication among subordinates is likely to exacerbate reporting dishonesty when vertical pay dispersion is high, although we leave tests of this conjecture to future research. Second, to ensure that the superior’s objective function is comparable across experimental conditions, we limit the superior’s pay to a fixed salary only. Future research could examine how providing financial incentives to the superior would change their threshold decisions and the evolvement of reporting norms. However, we do not expect that when the superior shares project profits, strategic concern would play a more salient role in subordinates’ reporting decisions. More importantly, since overstatement will effectively reduce the superior’s compensation, driven by fairness concerns,
the subordinates may be more motivated to misreport project costs when the vertical pay
dispersion is high.

Notwithstanding its limitations, this study extends the budgeting literature and practice by
identifying how peer observability shapes different reporting norms at different levels of vertical
pay dispersion. We extend Guo et al. (2016) to a multi-subordinate setting and find that, in order
to preserve a relatively honest reporting environment, a firm’s information (openness) policy
needs to be aligned with its incentive system. When firms choose a high level of vertical pay
dispersion to attract or motivate employees, they should consider carefully whether to also
implement an open information policy as information openness likely compromises the firm’s
honest reporting environment. On the other hand, when vertical pay dispersion is low, ‘open
office’ policies that encourage information exchange among peers are likely more conducive to a
more honest reporting environment. Therefore, while it is worthwhile to encourage transparency
among peers when vertical pay dispersion is low, promoting it warrants caution when vertical
pay dispersion is high.
References


FIGURE 1
Effect of Vertical Pay Dispersion and Peer Observability on Subordinates’ \textit{F-OVERSTATE}

FIGURE 1A: Subordinates’ Average \textit{F-OVERSTATE} by Condition

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure1a.png}
\caption{Subordinates’ Average \textit{F-OVERSTATE} by Condition}
\end{figure}

\begin{itemize}
\item \textbf{F-OVERSTATE} – Represents subordinates’ percentage of cost overstatement in their final cost submissions, calculated as (reported cost – actual cost) / (maximum cost of $40 – actual cost).
\item \textbf{DISPERSION} – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).
\item \textbf{OBSERVABILITY} – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
\end{itemize}
### TABLE 1
**Descriptive Statistics**

Panel A: Mean (Standard Deviation) and Median for Subordinates’ $F$-OVERSTATE by Pay Dispersion and by Peer Observability

<table>
<thead>
<tr>
<th>OBSERVABILITY</th>
<th>LOW DISPERSION ($12:$10)</th>
<th>HIGH DISPERSION ($25:$10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mean (Std. Dev.)</td>
<td>37.28% (0.23)</td>
<td>28.39% (0.18)</td>
</tr>
<tr>
<td>Median</td>
<td>32.84%</td>
<td>26.97%</td>
</tr>
<tr>
<td># of Obs.</td>
<td>N = 128</td>
<td>N = 112</td>
</tr>
</tbody>
</table>

Panel B: Mean (Standard Deviation) and Median for Subordinates’ $Δ$OVERSTATE by Pay Dispersion and by Peer Observability

<table>
<thead>
<tr>
<th>OBSERVABILITY</th>
<th>LOW DISPERSION ($12:$10)</th>
<th>HIGH DISPERSION ($25:$10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mean (Std. Dev.)</td>
<td>-0.32% (0.04)</td>
<td>-4.60% (0.16)</td>
</tr>
<tr>
<td>Median</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td># of Obs.</td>
<td>N = 128</td>
<td>N = 112</td>
</tr>
</tbody>
</table>

$F$-OVERSTATE - Represents subordinates’ percentage of cost overstatement in their final cost submissions, calculated as (reported cost – actual cost) / (maximum cost of $40 – actual cost).

$Δ$OVERSTATE - Represents subordinates’ change in percentage of cost overstatement between their final and initial cost submissions within each decision period.

DISPERSION – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).

OBSERVABILITY – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
TABLE 2
Test of H1a & H1b – Effect of Pay Dispersion and Peer Observability on Subordinates’
F-OVERSTATE

Panel A: Repeated-Measures ANOVA Results

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>MS</th>
<th>F-value</th>
<th>p-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPERSION</td>
<td>1</td>
<td>0.18</td>
<td>0.90</td>
<td>0.35</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td>1</td>
<td>0.06</td>
<td>0.31</td>
<td>0.58</td>
</tr>
<tr>
<td>DISPERSION*OBSERVABILITY</td>
<td>1</td>
<td>1.54</td>
<td>7.58</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERIOD</td>
<td>7</td>
<td>0.12</td>
<td>5.09</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>PERIOD* DISPERSION</td>
<td>7</td>
<td>0.01</td>
<td>0.53</td>
<td>0.81</td>
</tr>
<tr>
<td>PERIOD*OBSERVABILITY</td>
<td>7</td>
<td>0.02</td>
<td>0.67</td>
<td>0.69</td>
</tr>
<tr>
<td>PERIOD<em>DISP</em>OBSERV</td>
<td>7</td>
<td>0.01</td>
<td>0.36</td>
<td>0.92</td>
</tr>
<tr>
<td>Error (PERIOD)</td>
<td>406</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Simple Effect Analyses

<table>
<thead>
<tr>
<th></th>
<th>F-ratio</th>
<th>p-value (one-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a: Effect of peer observability under low dispersion condition</td>
<td>2.63</td>
<td>0.06</td>
</tr>
<tr>
<td>H1b: Effect of peer observability under high dispersion condition</td>
<td>5.13</td>
<td>0.02</td>
</tr>
</tbody>
</table>

F-OVERSTATE - Represents subordinates’ percentage of cost overstatement in their final cost submissions, calculated as (reported cost – actual cost) / (maximum cost of $40 – actual cost)
DISPERSION – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).
OBSERVABILITY – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
## TABLE 3
Effect of Pay Dispersion and Peer Observability on Subordinates’ ΔOVERSTATE

### Panel A: Repeated-Measures ANOVA Results

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>MS</th>
<th>F-value</th>
<th>p-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPERSSION</td>
<td>1</td>
<td>0.23</td>
<td>5.33</td>
<td>0.02</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td>1</td>
<td>&lt;0.01</td>
<td>0.00</td>
<td>0.96</td>
</tr>
<tr>
<td>DISPERSSION*OBSERVABILITY</td>
<td>1</td>
<td>0.22</td>
<td>4.92</td>
<td><strong>0.03</strong></td>
</tr>
<tr>
<td>Error</td>
<td>58</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERIOD</td>
<td>7</td>
<td>0.02</td>
<td>1.24</td>
<td>0.28</td>
</tr>
<tr>
<td>PERIOD*DISPERSSION</td>
<td>7</td>
<td>0.01</td>
<td>0.71</td>
<td>0.66</td>
</tr>
<tr>
<td>PERIOD*OBSERVABILITY</td>
<td>7</td>
<td>0.02</td>
<td>1.13</td>
<td>0.34</td>
</tr>
<tr>
<td>PERIOD<em>DISP</em>OBSERV</td>
<td>7</td>
<td>0.01</td>
<td>0.51</td>
<td>0.83</td>
</tr>
<tr>
<td>Error (PERIOD)</td>
<td>406</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Panel B: Simple Effect Analyses

<table>
<thead>
<tr>
<th>F-ratio</th>
<th>p-value (one-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1a:</strong> Effect of peer observability under low dispersion condition</td>
<td>4.12</td>
</tr>
<tr>
<td><strong>H1b:</strong> Effect of peer observability under high dispersion condition</td>
<td>1.77</td>
</tr>
</tbody>
</table>

*ΔOVERSTATE* - Represents subordinates’ change in percentage of cost overstatement between their final and initial cost submissions within each decision period.

*DISPERSSION* – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).

*OBSERVABILITY* – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
### TABLE 4
Test of H2a & H2b: Asymmetric Effect of Peer (Dis)Honesty on Subordinates’ ΔOVERSTATE

Regression Results under Peer-Observability Conditions: T-value (p-value) and Standardized Coefficient

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Low Pay Dispersion ($12:$10)</th>
<th>High Pay Dispersion ($25:$10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T-value (p-value)</td>
<td>Standardized Coefficient</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.35 (0.73)</td>
<td>0.98 (0.33)</td>
</tr>
<tr>
<td>PMORE-HONEST* PDIFF</td>
<td><strong>6.60 (&lt;0.01)</strong></td>
<td><strong>0.60</strong></td>
</tr>
<tr>
<td>PLESS-HONEST* PDIFF</td>
<td>0.18 (0.86)</td>
<td>0.02</td>
</tr>
<tr>
<td>Period</td>
<td>&lt;1.07 (&gt;0.28)</td>
<td>&lt;0.11</td>
</tr>
<tr>
<td>Number of observations</td>
<td>N=112</td>
<td>N=128</td>
</tr>
</tbody>
</table>

ΔOVERSTATE – Represents the difference in overstatement between a subordinate’s final and initial cost submissions. Period Dummy Variables – Represent seven dummy variables that are coded as 1 if it is Period 2, Period 3, Period 4, Period 5, Period 6, Period 7 and Period 8, respectively, and 0 otherwise. PDIFF – Represents the OVERSTATE difference between the peer and the focal subordinate’s initial cost submission. PMORE-HONEST: dummy variable; it equals 1 when peer is more honest than the focal subordinate in the initial cost submission, and 0 otherwise. PLESS-HONEST: dummy variable; it equals 1 when peer is less honest than the focal subordinate in the initial cost submission, and 0 otherwise.
**TABLE 5**  
Analysis of Variance on Subordinates’ *UNFAIRNESS*

Panel A: Mean (Standard Deviation) and Median of Individual Subordinates’  
*UNFAIRNESS* by Pay Dispersion and by Peer Observability

<table>
<thead>
<tr>
<th>OBSERVABILITY</th>
<th>LOW DISPERSION ($12:$10)</th>
<th>HIGH DISPERSION ($25:$10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mean</td>
<td>4.00</td>
<td>2.86</td>
</tr>
<tr>
<td>(Std. Dev.)</td>
<td>(2.71)</td>
<td>(2.21)</td>
</tr>
<tr>
<td>Median</td>
<td>3.50</td>
<td>2.00</td>
</tr>
<tr>
<td># of Obs.</td>
<td>N = 16</td>
<td>N = 14</td>
</tr>
</tbody>
</table>

Panel B: Effect of DISPERSION & OBSERVABILITY on FAIRNESS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F-value</th>
<th>p-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPERSION</td>
<td>81.02</td>
<td>1</td>
<td>81.02</td>
<td>12.87</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td>0.02</td>
<td>1</td>
<td>0.02</td>
<td>0.00</td>
<td>0.95</td>
</tr>
<tr>
<td>DISPERSION*OBSERVABLE</td>
<td>18.78</td>
<td>1</td>
<td>18.78</td>
<td>2.98</td>
<td>0.09</td>
</tr>
<tr>
<td>Error</td>
<td>2.48</td>
<td>58</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*UNFAIRNESS* – Represents subordinate’s distributional fairness concerns, which is measured by subordinate’s response to the statement of “I felt a sense of unfairness about my pay relative to my superior (1: strongly disagree; 10: strongly agree).”

*DISPERSION* – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).

*OBSERVABILITY* – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
TABLE 6

Effect of Pay Dispersion and Peer Observability on Superiors’ THRESHOLD

Panel A: Mean (Standard Deviation) and Median for Subordinates’ THRESHOLD by Pay Dispersion and by Peer Observability

<table>
<thead>
<tr>
<th></th>
<th>LOW DISPERSION ($12:$10)</th>
<th></th>
<th>HIGH DISPERSION ($25:$10)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>30.86</td>
<td>28.13</td>
<td>29.34</td>
<td>32.05</td>
</tr>
<tr>
<td>(Std. Dev.)</td>
<td>7.17</td>
<td>(5.66)</td>
<td>(5.43)</td>
<td>(5.48)</td>
</tr>
<tr>
<td>Median</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td># of Obs.</td>
<td>N = 64</td>
<td>N = 56</td>
<td>N = 64</td>
<td>N = 64</td>
</tr>
</tbody>
</table>

Panel B: Repeated-Measures ANOVA Results

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>MS</th>
<th>F-value</th>
<th>p-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPERSION</td>
<td>1</td>
<td>89.45</td>
<td>0.39</td>
<td>0.54</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td>1</td>
<td>0.02</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>DISPERSION*OBSERVABILITY</td>
<td>1</td>
<td>456.75</td>
<td>1.99</td>
<td>0.17</td>
</tr>
<tr>
<td>Error</td>
<td>27</td>
<td>229.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERIOD</td>
<td>7</td>
<td>9.01</td>
<td>0.75</td>
<td>0.63</td>
</tr>
<tr>
<td>PERIOD* DISPERSION</td>
<td>7</td>
<td>15.13</td>
<td>1.26</td>
<td>0.27</td>
</tr>
<tr>
<td>PERIOD*OBSERVABILITY</td>
<td>7</td>
<td>10.50</td>
<td>0.88</td>
<td>0.53</td>
</tr>
<tr>
<td>PERIOD<em>DISP</em>OBSERV</td>
<td>7</td>
<td>6.39</td>
<td>0.53</td>
<td>0.81</td>
</tr>
<tr>
<td>Error (PERIOD)</td>
<td>189</td>
<td>11.98</td>
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<td></td>
</tr>
</tbody>
</table>

THRESHOLD - Represents superiors’ choice of maximum threshold above which proposed projects will be rejected. It can be any whole number between 1 and 40.
DISPERSION – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).
OBSERVABILITY – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.
### TABLE 7
Effect of Pay Dispersion and Peer Observability on PROFIT

Panel A: Mean (Standard Deviation) and Median for PROFIT by Pay Dispersion and by Peer Observability

<table>
<thead>
<tr>
<th>OBSERVABILITY</th>
<th>LOW DISPERSION ($12:$10)</th>
<th>HIGH DISPERSION ($25:$10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mean</td>
<td>23.28 (16.55)</td>
<td>27.61 (19.93)</td>
</tr>
<tr>
<td>Median</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td># of Obs.</td>
<td>N = 64</td>
<td>N = 56</td>
</tr>
</tbody>
</table>

Panel B: Repeated-Measures ANOVA Results

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>MS</th>
<th>F-value</th>
<th>p-value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPERSION</td>
<td>1</td>
<td>19.63</td>
<td>0.10</td>
<td>0.75</td>
</tr>
<tr>
<td>OBSERVABILITY</td>
<td>1</td>
<td>5.49</td>
<td>0.03</td>
<td>0.87</td>
</tr>
<tr>
<td>DISPERSION*OBSERVABILITY</td>
<td>1</td>
<td>1321.16</td>
<td>6.95</td>
<td>0.01</td>
</tr>
<tr>
<td>Error</td>
<td>27</td>
<td>189.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within-Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERIOD</td>
<td>7</td>
<td>6518.45</td>
<td>47.99</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>PERIOD* DISPERSION</td>
<td>7</td>
<td>52.12</td>
<td>0.38</td>
<td>0.91</td>
</tr>
<tr>
<td>PERIOD*OBSERVABILITY</td>
<td>7</td>
<td>47.97</td>
<td>0.35</td>
<td>0.93</td>
</tr>
<tr>
<td>PERIOD<em>DISP</em>OBSERV</td>
<td>7</td>
<td>176.44</td>
<td>1.30</td>
<td>0.25</td>
</tr>
<tr>
<td>Error (PERIOD)</td>
<td>189</td>
<td>135.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PROFIT – Represents the project profit generated from both subordinates of the same firm. For each project, it is the total project profits (i.e., $40 of revenue minus project cost as reported by the subordinate in his/her final submission) from both subordinates reporting to the same superior.

DISPERSION – Represents vertical pay dispersion, being either low ($12:$10) or high ($25:$10).

OBSERVABILITY – Represents peer observability condition (i.e., whether subordinates could observe their peers’ actual cost and cost reports), being either absent or present.