

Spillover Effects in Subjective Performance Evaluation: Bias and the Asymmetric Influence of Controllability

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ABSTRACT: We examine how subjective performance evaluations are influenced by the level and controllability of an accompanying measure of a separate performance dimension. In our experiment, supervisors evaluate the office administration performance of a hypothetical subordinate. We find that supervisors' subjective evaluations are directionally influenced by an accompanying objective measure of sales performance, even after excluding participants who perceive informativeness across measures. Consistent with concerns for fairness and motivation, we also find an asymmetric uncontrollability effect—supervisors' evaluations are higher when an uncontrollable factor decreases the subordinate's sales (i.e., they compensate for bad luck), but are not lower when the uncontrollable factor increases the subordinate's sales (i.e., they do not punish for good luck). This evidence suggests that supervisors use discretion provided to evaluate performance on one task to adjust for perceived deficiencies in the evaluation of performance on other tasks. Our study integrates theories of cognitive bias and motivation, highlighting the need to consider the potentially interactive effects of different performance measures in multi-task settings.

Keywords: *subjective performance evaluation; performance measurement; cognitive bias; controllability; fairness.*

Data Availability: *Contact the authors.*

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I. INTRODUCTION

Organizational incentive systems often allow managerial discretion in the evaluation of employee performance (Murphy and Oyer 2003). Subjective performance evaluation allows managers to use noncontractible information to assess actions and efforts that objective measures (such as those produced by the accounting system) are not able to capture, creating a more complete depiction of employee performance (Bol 2008).¹ Subjectivity can therefore be useful in reducing risk to employees and improving the incentive alignment of the firm's performance measurement system (Baker et al. 1994; Bushman et al. 1996; Hayes and Schaefer 2000).²

Many performance measurement systems include both objective measures and subjective evaluations (Prendergast 1999; Gibbs et al. 2004). While designed to capture separate dimensions of employee performance, these different measurement types can influence each other. For example, theories from psychology and organizational behavior suggest that subjective judgments can be unduly influenced by an individual's knowledge of other, unrelated information (Nisbett et al. 1981; Bond et al. 2007). Such an influence could limit the complementary role of subjective evaluation in improving the overall informativeness of the measures used to evaluate performance.

We examine how supervisors' subjective performance evaluations are affected by the level and controllability of an objective measure of a separate aspect of performance. We analyze a two-dimensional employment setting in which an employee's performance on one dimension (i.e., task) is measured objectively, while performance on the other dimension is evaluated subjectively by the supervisor. In many such settings, the objective performance measure is known by the supervisor before s/he subjectively evaluates the employee's performance on the other dimension (Huber et al. 1987; Bommer et al. 1995). Our first research question examines whether the level of the objective measure has a directional impact on the supervisor's subjective evaluation. Specifically, we examine whether, consistent with cognitive distortion, supervisors bias their subjective evaluations of performance on one dimension to be consistent with an objective measure of performance on a separate and unrelated dimension.³

Our second research question considers how such a spillover effect differs when the controllability of the objective performance measure is relatively low. Uncontrollability introduces noise and error into the performance measurement system (Feltham and Xie 1994), and has been shown to affect attribution judgments (Tan and Lipe 1997). Employees are likely to perceive uncontrollable performance measures to be unfair when the uncontrollability reduces measured performance. Perceptions of unfairness in compensation lead to reduced job satisfaction and motivation (Cohen-Charash and Spector 2001; Colquitt et al. 2001). We examine whether this expectation is reflected in supervisors' use of their discretion, even when that discretion is provided for the evaluation of a separate task. Specifically, we examine whether supervisors use the discretion in their subjective evaluations to adjust for (or offset) the effects of an uncontrollable objective measure. Consistent with concerns for fairness and employee motivation, we predict that

¹ We define subjectivity as judgment based on personal impressions and opinions, which are not verifiable in a court of law and are therefore noncontractible.

² Subjectivity in performance evaluation can be introduced by the use of subjective performance measures, by allowing for *ex post* flexibility in the weighting of objective performance measures, or by allowing for *ex post* discretionary adjustment based on factors other than the performance measures specified *ex ante* (Bol 2008). Our focus is on the first of these mechanisms.

³ It is possible that supervisors' subjective evaluations may be influenced by other *subjective* measures as well as by objective measures. We specifically examine the effect of *objective* performance measures because such measures are likely to be known at the time the subjective evaluation is performed, and because of our interest in the interactive effect of controllability, which is most likely to be a feature of objective performance measures.

supervisors will make such an adjustment when the uncontrollable factor reduces measured performance (i.e., the employee suffers from bad luck) but not when it increases measured performance (i.e., the employee benefits from good luck).

In our experiment, experienced supervisors employed by a large state university participate as evaluators in a hypothetical case setting. Participants assume the role of a regional director with supervisory authority over district managers who have both sales- and office administration-related duties. Objective individual sales information is given, after which participants are charged with subjectively evaluating the office administration performance of one district manager based on personal notes and staff interview responses, which are held constant in all conditions. The experiment employs a $2 \times 2 + 1$ between-subjects design. In four treatment conditions, we manipulate the level of the manager's individual sales at two levels by varying the objective sales score (high and low), and we manipulate the controllability of the individual sales measure at two levels by varying whether significant but uncontrollable events impacted the manager's sales during the period. A fifth (control) condition includes only the information about the manager's office administration performance.

We find that supervisors' subjective evaluations of the manager's office administration performance are significantly higher (lower) when the objective level of the manager's individual sales measure is relatively high (low). By excluding those participants who perceived the individual sales measure to be informative about the manager's office administration performance in our primary analysis, we provide evidence of cognitive distortion of performance information as a result of exposure to the objective measure.

We also find that the effect of the objective measure depends on its controllability. Specifically, participants use their subjective evaluations to adjust for the impact of uncontrollable events on the sales measure. Consistent with theory, this effect is asymmetric—participants' evaluations are higher (relative to the high controllability condition) when the uncontrollable factor leads to an unfavorable outcome, but are no lower when the uncontrollable factor leads to a favorable outcome. Thus, we find that participants use their discretion to compensate for bad luck, but not to punish for good luck.

This study contributes to the accounting and management literatures on performance evaluation. Prior research on bias in performance evaluation has found that supervisors' subjective evaluations of current performance may be directionally influenced by prior performance information (Murphy et al. 1985; Huber et al. 1987; Kravitz and Balzer 1992) or information from different sources (Blakely 1993; Murphy and Cleveland 1995; Bono and Colbert 2005). Our study contributes to this line of research by showing that cognitive distortion can cause spillover from the objective evaluation of one dimension of performance to the subjective evaluation of performance on a separate and unrelated dimension.

Prior research has also found evidence that controllability concerns can affect evaluators' judgments in single-dimension performance-evaluation settings. For example, Tan and Lipe (1997) find that controllability moderates outcome effects in evaluators' judgments (also see Brown and Solomon 1987). Our study reveals a very different controllability effect. Specifically, our results suggest that supervisors can use discretion that is provided for the evaluation of performance on a particular dimension to "correct" perceived deficiencies in other areas of the evaluation system. While the use of "borrowed" discretion can yield motivational benefits for employees, the intended benefits of that discretion (i.e., accurate reflection of performance on a specific dimension) can be reduced. Overall, our evidence indicates that the known level of an objective performance measure compromises the effectiveness of subjective performance evaluation for completing the picture of employee performance. Thus, our results have implications for the weight, timing, and nature of subjectivity in compensation contracting, suggesting that consideration of different measurement types in isolation can lead to incomplete conclusions about the optimal design of performance measurement systems.

An asymmetric pattern of compensation payouts, in which managers are sheltered from downside risk but are allowed the advantages of upside risk, has been demonstrated in accounting

research (Gaver and Gaver 1998; Bertrand and Mullainathan 2001). While our study shows a similar pattern, it differs from this research by demonstrating the phenomenon of borrowed discretion, and by illustrating this effect in a performance-evaluation setting without the possible explanations of personal relationships, managerial entrenchment, or other issues related to corporate governance.

Our study also demonstrates that particular features of accounting information (in this case, the controllability of an objective performance measure) can produce differences in the spillover effects it induces in decision-makers' judgments. Predominantly, the effect of the objective performance measure is driven by its directional content, and the spillover effect takes the form of assimilation. However, when the objective performance measure is reduced by an uncontrollable factor, fairness and motivational concerns are triggered, inducing a corrective adjustment that offsets the directional bias. Thus, our study integrates theories of cognitive distortion and fairness, providing evidence that the interaction of objective and subjective performance measures depends on the fundamental qualities of the objective measure.

Section II presents background and hypotheses. Section III describes the experimental methodology, Section IV presents the results, and Section V concludes.

II. BACKGROUND AND HYPOTHESES

Prior Literature

Prior research has explored potential drawbacks of the use of subjective performance evaluation. These studies find that the role of human judgment, along with the inability to verify outcomes, can give rise to a number of problems that may limit the informativeness and incentive-strengthening role of subjective measures (Prendergast and Topel 1993, 1996; Bol 2008, 2011). Much of the research in this area has focused on supervisors' personal incentives to distort evaluations. For example, Bol (2011) finds that supervisors' tendency toward centrality and leniency in their evaluations is associated with incentive-related factors. Executives in Longenecker et al. (1987) confirm that they often prioritize incentive-consistent goals (e.g., higher raises for one's subordinates, improved motivation and encouragement, and signaling to poor performers) over accuracy in their evaluations.

A related literature has examined how subjective performance evaluations are influenced by cognitive limitations. Research on context effects examines how assimilation or contrast arises when evaluators have knowledge of an employee's performance in a prior period when evaluating his/her current-period performance (Murphy et al. 1985; Kravitz and Balzer 1992). Research on the halo effect finds that supervisors attend to general impressions when evaluating subordinates (Nisbett and Wilson 1977; Fox et al. 1983; Tan and Jamal 2001). Research in specific accounting domains has also explored the role of cognitive limitations in performance evaluation. Lipe and Salterio (2000) find that supervisors with discretion in the weighting of different performance measures underweight unique measures in favor of common measures. Ittner et al. (2003) provide evidence that supervisors place greater weight on outcome/results measures than on input/driver measures, and that they place more weight on objective or quantitative measures than on subjective or qualitative measures. Bailey et al. (2011) find that managers' reliance on the anchoring and adjustment heuristic prevents the full incorporation of non-contracted (i.e., subjective) information in the allocation of a bonus pool.

These studies suggest that cognitive limitations can preclude the full benefits of introducing subjectivity into compensation contracts. The purpose of our study is to examine the potentially interactive effects of objective and subjective performance measures. Specifically, we examine whether cognitive limitations preclude what should be independent assessments of separate and

unrelated performance dimensions, and how the controllability of the objective measure influences this interaction.

Hypothesis Development

We consider a multi-task setting in which an employee's performance on one task is evaluated objectively, while performance on a separate task is evaluated subjectively.⁴ In many such settings, the objective performance measure for a period is known before the subjective performance evaluation takes place (Huber et al. 1987; Bommer et al. 1995). For example, a supervisor is likely to observe an employee's individual sales or production performance in a period before conducting a formal evaluation of that employee's performance on more qualitative dimensions such as leadership, teamwork, creativity, communication, and attitude.

Because subjective performance evaluations cannot be verified by outside parties, supervisors could be influenced by their own preferences when evaluating performance (Prendergast and Topel 1993). We argue, however, that even in the absence of personal incentives to bias evaluations, supervisors are likely to be influenced by the observed level of performance on one task when subjectively evaluating an employee's performance on a separate task. We also argue that the form of an objective measure's "spillover" will depend on its controllability, or the degree to which an employee can affect the measure by altering his/her action inputs (Antle and Demski 1988).

Cognitive Distortion

The supervisor's knowledge of an employee's objective performance on one dimension is likely to affect his/her subjective evaluation of performance on a separate dimension by inducing *cognitive information distortion*. Specifically, supervisors will unintentionally bias their subjective evaluations to be consistent with the known level of performance on the objective measure. Prior research shows that individuals tend to unknowingly process information in a way that favors a previously held belief, desired outcome, or developing preference (Wilks 2002; Bond et al. 2007).

Bond et al. (2007) argue that, in the evaluation of a single option, information observed early evokes an "evaluative disposition," and that the subjective encoding, weighting, and interpretation of subsequent information is influenced to be coherent with that disposition. In the case of multi-task performance evaluation, this occurs when the known level of performance on one dimension causes the supervisor to unknowingly process the available information about performance on a separate dimension in the same direction. That is, a supervisor who observes a relatively high level of performance on one dimension is likely to interpret information about the subordinate's performance on a separate dimension more favorably than a supervisor who observes a relatively low level of performance on the first dimension.⁵

⁴ We assume a system in which the supervisor is not allowed any other forms of discretion (for example, subjective weightings or subjective adjustment to objective measures). In other words, the only discretion resides in the supervisor's evaluation of performance on one of the two tasks.

⁵ Cognitive distortion is related to but conceptually different from other context effects, such as anchoring and adjustment and confirmation bias (Bond et al. 2007). For example, there is an emerging consensus that the anchoring and adjustment heuristic arises due to biased accessibility of information from memory (Gilovich 1991; Baron 1995; Chapman and Johnson 1999; Mussweiler and Strack 1999), while confirmation bias reflects a bias in the search for information from the environment (Frey 1986; Klayman and Ha 1987). Because our study relates to the subjective interpretation of information (rather than how it is obtained), cognitive distortion (a processing-related phenomenon) is the most fitting explanation for the mechanism underlying the directional bias we predict.

As mentioned, objective measures of performance are likely to be known by supervisors when they conduct subjective evaluations of subordinates' performance. The literature cited above suggests that this knowledge will generate a directional bias that affects subsequent judgments. Thus, we predict that, consistent with cognitive distortion, supervisors' subjective performance evaluations will be influenced in the direction of their subordinates' objective performance levels.

H1: Supervisors' subjective performance evaluations will be higher (lower) when the employee's performance on an unrelated objective measure is higher (lower).

It is important to note that if the objective level of performance on one task is seen by the supervisor as informative about (i.e., related to) the employee's performance on the other task, then the supervisor may *intentionally* incorporate information from the objective measure into his/her subjective evaluation. Economics-based models of performance measurement suggest that any (costless) measure that provides incremental information about employee performance should be included in the evaluation (Holmstrom 1979; Banker and Datar 1989). This reasoning can be intuitively extended to the use of information from a measure of performance on one task to the (subjective) evaluation of performance on another task. However, our interest in this study is in spillover effects arising from cognitive processes independent of supervisors' perceptions of informativeness. Thus, our experiment creates a setting in which the two performance measures are unrelated, and in our main analysis we exclude participants who nevertheless perceive informativeness across the two measures in order to provide the most conservative test of our theory.⁶

Controllability

In this section we examine how the controllability of an objective measure can influence the spillover effect it induces in supervisors' judgments. Controllable performance measures are preferred from a contracting perspective because uncontrollability reduces the informativeness of a measure about employee actions and effort, and because agents need to be compensated for the additional risk of uncontrollable factors (Holmstrom 1979). In practice, however, measures that are perfectly controllable are extremely rare. Indeed, noise as a common feature of objective performance measures is among the primary reasons for the use of subjective performance evaluation (Baker et al. 1994).

When an objective measure is relatively low in controllability, its spillover effect will take a different form. We predict that uncontrollability in the objective performance measure will trigger the supervisor's consideration of the measure's quality and its effect on the employee's overall evaluation. Specifically, supervisors have incentives to consider the fairness of performance evaluations, not only due simply to their individual preferences for justice (Fehr and Fischbacher 2002), but also (and perhaps more importantly) because employee perceptions of unfairness in evaluation and compensation have a negative effect on satisfaction and motivation (Greenberg 1987; Cohen-Charash and Spector 2001; Colquitt et al. 2001). Bol et al. (2010) find that supervisors adjust performance targets to address fairness concerns arising within compensation contracts.

Because of the importance of employee satisfaction and motivation for productivity, we predict that supervisors will use the discretion available to them to "correct" or adjust for an uncontrollable

⁶ Despite efforts to create orthogonal performance dimensions, we are unable to *ex ante* eliminate a conscious influence based on perceived informativeness as a partial explanation of our results. In many settings, tasks are bundled together for a single employee because of presumed complementarities in the performance of those tasks (Milgrom and Roberts 1992). Thus, it would be difficult to argue complete unrelatedness for a multi-task experimental setting that is designed to be realistic.

factor, even if that discretion is provided for a separate purpose. However, an adjustment for an uncontrollable factor is likely to depend on its directional impact. When an uncontrollable factor causes measured performance to be lower than it would likely have been otherwise, the employee is likely to feel that the measure does not capture his/her real efforts or contribution to the firm, and that this may result in lower compensation. As a result, s/he will consider the measure unfair and suffer reduced satisfaction and motivation. In order to protect the employee from this downside risk and to avoid the negative effects on employee motivation, the supervisor can exercise the discretion *in his/her subjective evaluation* by adjusting upward (i.e., giving a relatively higher evaluation) to countervail the relatively low level of the uncontrollable measure. In this case, the supervisor's subjective evaluation is still biased downward because of exposure to the low objective measure, but concern for the employee's motivation offsets the bias, leading the supervisor to adjust upward to ensure an *overall* evaluation that the employee will perceive as fair.

In contrast, when an uncontrollable factor causes measured performance to be higher than it would have been otherwise, the employee is unlikely to perceive unfairness or to feel reduced motivation.⁷ In this case, the supervisor's use of discretion to "correct" the discrepancy between measured and actual performance (i.e., by giving a relatively lower evaluation) would likely be considered an inappropriate and unfair departure from the prescribed evaluation procedure. Thus, while the supervisor is likely to recognize that the measure fails to capture the employee's true contribution, s/he has no incentive to correct it, and the directional bias predicted in H1 is not expected to be offset.

In summary, we predict that supervisors' use of discretion to adjust for uncontrollability in a separate performance measure follows an asymmetric pattern. When an uncontrollable factor leads to an unfavorable outcome, supervisors' consideration of the employees' fairness perceptions and motivation offsets the directional bias, and we predict higher evaluations relative to the high controllability condition. However, when an uncontrollable factor leads to a favorable outcome, supervisors will not use their discretion to correct, and we predict no difference in subjective evaluations relative to the high controllability condition.

H2a: When the employee's performance on an unrelated objective measure is relatively low, the supervisor's subjective performance evaluation will be higher (lower) when the objective measure is (is not) reduced by an uncontrollable factor.

H2b (null hypothesis): When the employee's performance on an unrelated objective measure is relatively high, the supervisor's subjective performance evaluation will not be affected by whether the objective measure is increased by an uncontrollable factor.

III. METHOD

Participants completed a performance evaluation task in a hypothetical case setting, assuming the role of a regional director for an industrial pipe and fitting company. The regional director's job was described as overseeing a number of district managers who were responsible for both individual sales and district office administration. The experimental task was to perform a subjective evaluation of the office administration performance of one of the district managers, while the manager's score on an objective individual sales measure was known.

⁷ This is consistent with the well-established principle that unfairness is felt more (less) acutely when distributed rewards are less (more) than what is felt to be just (Jasso 1978). Similarly, prior research in organizational behavior finds that consideration of the fairness of the evaluation procedure is triggered when the outcome is low, but not when it is high (Cropanzano and Folger 1989; Cropanzano and Konovsky 1995).

Participants

Supervisors ($n = 216$) at a large, public university participated in the experiment. Participants were targeted through a university database search for non-academic employees in supervisory positions. They received a letter by mail, inviting them to participate. A follow-up email invitation was sent about two weeks later. As an incentive to complete the study, all participants' names were entered into 20 random drawings, each worth \$200.

Participants reported an average of 30 years of total work experience and 13 years of supervisory experience. In addition, participants supervised an average of nine employees in their current positions. Participants reported an average of ten years of performance-evaluation experience, and 60 percent reported having either formal or informal performance-evaluation duties for an average of six subordinate employees in their current positions. Finally, participants reported that about 50 percent of their performance-evaluation duties involve subjective evaluation (versus objective measurement).⁸

Experimental Design

The experiment employs a $2 \times 2 + 1$ between-subjects design. We manipulate the district manager's score on the sales measure at two levels (high and low), and we manipulate the controllability of the objective sales measure at two levels (high and low). We also add a control condition in which no objective sales information is provided.

Independent Variables

In the four treatment conditions, the objective measure used in the performance-evaluation system is the district manager's individual sales during the most recent six-month period. The measure is scored on a 0–10 scale, with each score connected to a particular range of sales.

The level of the target district manager's performance on the sales dimension is manipulated by varying his individual sales score. Specifically, the district manager's individual sales score is stated as 2 (9) in the low (high) sales condition.

Controllability is manipulated by varying the degree to which outside factors influenced the manager's individual sales. In the high controllability condition, participants are told that market conditions were stable during the period, and that there were no unforeseen or uncontrollable events that impacted the manager's sales. In the low controllability condition, participants are told that an uncontrollable event—specifically, either the opening (when the sales measure was high) or closing (when the sales measure was low) of large facilities by major customers in the manager's district—had a major impact on the manager's sales during the period.

Dependent Variables

Our primary dependent variable is the subjective evaluation of the district manager's office administration performance. In order for participants to make this evaluation, the case information included a collection of personal notes and interview responses from the manager's office staff. This material was the same in all conditions. After reading the case information, participants provided a performance-evaluation score, on a scale from 0 to 10, reflecting their assessment of the district manager's office administration performance. They also answered a number of post-experimental questions.

⁸ We include participants' gender, years of work and supervisor experience, and number of evaluated subordinates as covariates in our statistical analyses. Results show that none of these variables interacts with the effects of interest.

Procedure

Participants completed an online experiment at their convenience by entering a URL into their web browsers. The survey program randomly assigned each participant to one of the five conditions (four treatment conditions and one control condition).

The case information asked each participant to assume a hypothetical situation in which he/she worked as a regional director for an industrial pipe and fitting company. A compressed organizational chart showed that the regional director had supervisory authority over ten district managers, who in turn supervised a number of sales associates and office staff. District managers' responsibilities and the associated performance measures were described.

The case informed participants that one of the regional director's duties was to conduct semiannual performance evaluations for each district manager under his/her supervision. The performance-evaluation system was described as comprising two components: an objective score based on individual sales and a subjective evaluation of the district manager's office administration performance. The instructions noted that the two components were independent because the job functions they captured were independent (i.e., performance on one job function was unrelated to performance on the other). Each component was scored on a 0–10 scale, and the two were averaged together (i.e., equally weighted) to arrive at the overall evaluation score. Participants were told that their task was to conduct the performance evaluation for one of the district managers. For the objective measure, a table showing the district managers' individual sales and their associated scores on the 0–10 scale was provided. The target district manager's sales were manipulated to be either high (9) or low (2). The manipulated controllability information was also given at this point.

For the subjective evaluation, participants were told that they had made some personal notes about the district manager over the six-month period, and those were provided. In addition, participants were told that because they were unable to observe the district manager's office administration performance on a daily basis, they had conducted interviews with a few members of his office staff, and the interview responses were also provided. The personal notes and interview responses were the same for all participants, and were designed to portray an average level of office administration performance. In the control condition, participants were asked to provide a subjective office administration evaluation, but were not given any individual sales information.

After reading all case information, participants were asked to indicate a score, on a 0–10 scale, reflecting their assessment of the district manager's office administration performance. They were also asked to average the two performance-evaluation components to arrive at the overall evaluation, and to assess their confidence in their judgments. They were then asked a number of post-experimental processing and demographic questions.

IV. RESULTS

Manipulation Checks and Information Sufficiency

We included two manipulation check questions in the post-experimental questionnaire. Participants recalled that the target manager's individual sales score was higher in the high sales condition than in the low sales condition ($p < 0.01$). Participants also judged the controllability of the sales measures to be higher in the high controllability condition than in the low controllability condition ($p < 0.01$). Thus, our manipulations of the level and controllability of the manager's individual sales measure were successful.

We also asked participants to rate (on a six-point scale) their agreement with a statement that the personal notes and interview responses about the target manager allowed them to make a reasonable judgment about the manager's office administration performance. The mean of this measure was 4.75 (s.d. = 1.05), significantly higher than the scale midpoint of 3.5 ($p < 0.01$). We

also asked participants to rate (on a seven-point scale) the confidence they felt in their evaluation judgments. The mean of this measure was 5.5 (s.d. = 1.1), significantly higher than the scale midpoint of 4.0 ($p < 0.01$). Together, these results suggest that participants felt they had sufficient information on the manager's office administration performance to make a reasonable assessment.

Table 1 shows the mean and standard deviation of office administration performance scores by experimental condition. Figure 1 displays the means of the high and low controllability conditions (at high and low sales levels), as well as the control condition. The figure shows the expected pattern of results; the overall mean evaluation is highest in the high sales condition (6.90), followed by the control condition (6.35) and the low sales condition (5.42), and the predicted asymmetric pattern of treatment means is apparent across the two controllability conditions. Preliminary analyses (untabulated) show that the mean of the control condition is significantly lower than the mean of the high sales condition ($t = 2.54$; $p = 0.01$) and significantly higher than the mean of the low sales condition ($t = 3.67$; $p < 0.01$). These results confirm that the mean in the control condition is not so extreme that floor or ceiling effects would prevent the hypothesized results, and they reveal a directional spillover effect occurring in both directions.

Hypothesis Tests

Cognitive Distortion

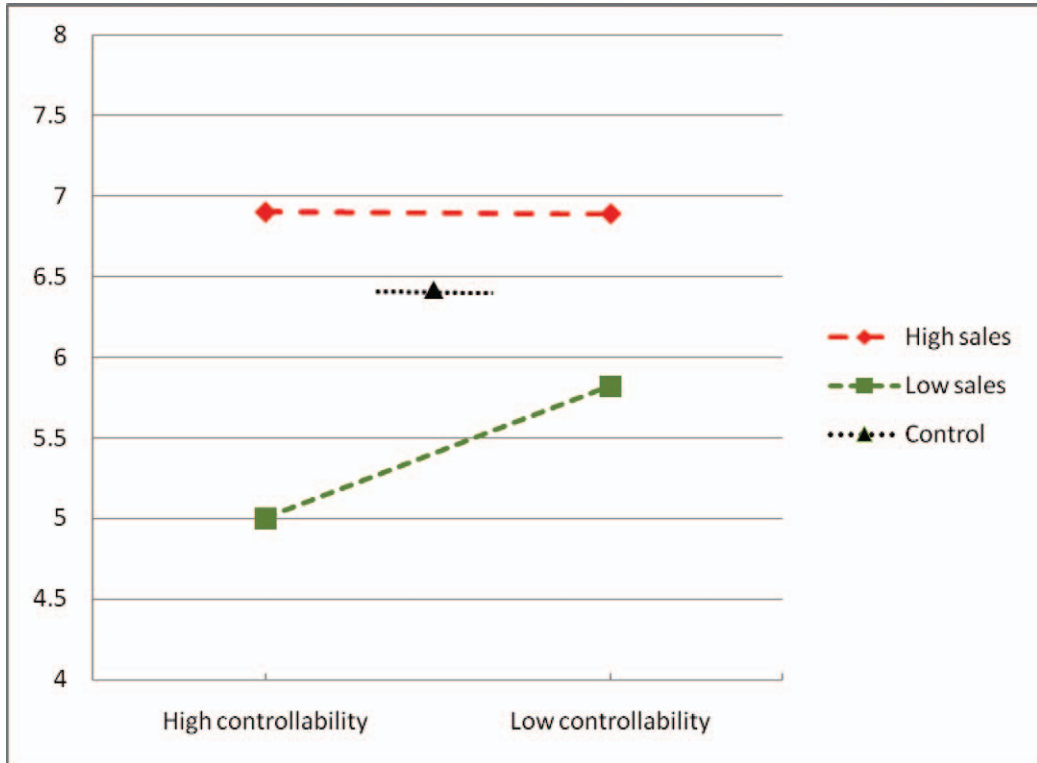
H1 predicts that participants' subjective office administration evaluations will be higher (lower) when the individual sales measure is higher (lower). In order to conduct the cleanest and most conservative test of our theory, we make the following adjustments. First, because H2a predicts that low controllability will work against a main effect of sales level, we test H1 by comparing the low and high sales conditions only under high controllability.

TABLE 1
Descriptive Statistics: Least Square Means (Std. Errors) of Evaluation Scores by Sales Measure Level and Controllability

	<u>High Controllability</u>	<u>Low Controllability</u>	<u>Row Mean</u>
High sales	6.90 (1.14) n = 42	6.89 (0.95) n = 46	6.90 (1.04) n = 88
Low sales	5.00 (1.31) n = 42	5.82 (1.72) n = 44	5.42 (1.58) n = 86
Column mean	5.95 (1.55) n = 84	6.37 (1.47) n = 90	
Control Condition:			
6.35 (1.21) n = 42			

Sales level is manipulated by varying whether the target sales manager achieved a relatively high or low sales score during the period (where each sales score was associated with a particular range of sales). Controllability is manipulated by varying whether an event outside the manager's control significantly affected his sales during the period. In the control condition no objective sales performance information was provided.

FIGURE 1
Mean Subjective Evaluations, High and Low Controllability, and Control Conditions



Second, as mentioned, it is possible that supervisors perceived that the sales measure contained information about the manager's office administration performance, and incorporated that information into their subjective evaluations. In order to isolate the role of cognitive distortion, we asked participants (using a Yes/No question in the post-experiment questionnaire) whether they believed the manager's individual sales score told them something about how well the manager performed as an office administrator. Within the high controllability condition, 65 percent of participants did not consider the sales measure to be informative for their subjective evaluations.⁹ Our primary test of H1 includes only these participants.¹⁰

⁹ Responses to this question varied across cells. Participants considered the objective measure to be significantly less informative when controllability was low (73 percent answering no) than when it was high (65 percent; $p < 0.01$) and considered the objective measure to be significantly less informative when the sales measure was high (77 percent) than when it was low (61 percent; $p < 0.01$).

¹⁰ The relatively high proportion of participants who perceived informativeness across the two measures does not arise from a misunderstanding of the case materials. In the post-experimental questionnaire, these participants indicated that they understood the two task dimensions were independent of each other (mean agreement = 6.0 on a seven-point scale). It is likely that these participants merely did not believe that the two dimensions were completely unrelated. While they were well understood, the case instructions regarding independent dimensions are at odds with a deep-seated tendency to expect employee performance on multiple tasks to be correlated (Newcomb 1931; Jacobs and Kozlowski 1985). We thank a reviewer for pointing this out.

We test H1 with a one-way analysis of variance (ANOVA), comparing participants' subjective evaluations by sales level in the high controllability condition. The results, provided in Table 2, Panel A, indicate a significant effect of sales level ($F = 16.23$; $p < 0.01$), supporting H1. Not surprisingly, untabulated results also show a significant effect of sales level for those participants who did find the sales measure to be informative ($F = 91.52$; $p < 0.01$) and for the full sample of all high controllability participants ($F = 50.54$; $p < 0.01$). In sum, our results provide strong support for H1, suggesting that the effect of the sales measure on participants' subjective evaluations is driven, at least in part, by cognitive distortion of the case information.¹¹

Controllability

H2a predicts that, when the employee's performance on an unrelated objective measure is relatively low, the supervisor's subjective performance evaluation will be higher (lower) when the objective measure is (is not) reduced by an uncontrollable factor. We test H2a with an ANOVA comparing the evaluations by controllability level in the low sales condition.¹² The results, provided in Table 2, Panel B, show a significant effect of controllability ($F = 6.15$; $p = 0.02$), supporting H2a.

H2b predicts that when the employee's performance on an unrelated objective measure is relatively high, the supervisor's subjective performance evaluation will not differ depending on whether the objective measure is increased by an uncontrollable factor. We test H2b with an ANOVA comparing the evaluations by controllability level in the high sales condition. The results, provided in Table 2, Panel C, show that the mean evaluation in the high sales, low controllability condition (6.89) is not significantly different from the mean in the high sales, high controllability condition (6.90) ($F = 0.00$; $p = 0.95$), failing to reject the null hypothesis H2b.

To address the possibility that the difference in controllability effects arose because participants perceived the effect of the uncontrollable factor on the quality of the sales measure differently across sales levels, we asked participants to rate (on a six-point scale) the extent to which the sales measure accurately reflected the manager's individual sales efforts. The mean ratings in the high sales, low controllability condition (mean = 3.59; s.d. = 1.27) and in the low sales, low controllability condition (mean = 3.25; s.d. = 1.57) are not statistically different ($p = 0.27$), yet both means are significantly lower than the mean rating in the high controllability conditions (mean = 4.88; s.d. = 1.22) ($p < 0.01$). Thus, participants perceived the sales measure to be similarly problematic in both low controllability conditions, yet they only adjusted for the measure when the uncontrollable factor reduced sales.

Supplemental Analyses

In order to gain a better understanding of participants' thought processes in the low controllability conditions, we asked participants to rate (on a seven-point scale) the extent to which

¹¹ Another potential explanation is that participants merely biased their subjective evaluations toward the objective measure levels to avoid the effort of processing the office administration information when conducting their evaluations. However, we would expect participants who took this approach to have poorer recall of the case information and/or to have spent less time completing the materials. Two separate analyses suggest that this does not explain the results. First, the post-experiment questionnaire included two quiz-type questions designed to confirm that participants had read the case materials carefully. Eighty-seven percent of participants correctly answered both questions, and results are identical when those who did not are excluded from the analyses. Second, we conduct an analysis of covariance using the amount of time participants spent on the experiment (used here as a proxy for effort) as a covariate. Results (untabulated) show that the amount of time taken does not interact with the effect of the sales level.

¹² We use the full sample of participants in the low controllability conditions for our tests of H2a and H2b because our primary interest is in participants' reactions to uncontrollability in the objective measure *regardless* of whether they perceive the measure to be informative for their subjective evaluations.

TABLE 2
Subjective Evaluation Results

Panel A: Analysis of Variance for Sales Level, High Controllability Condition

<u>Source</u>	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Sales level	1	21.89	16.23	< 0.01
Error	52	1.35		

Panel B: Analysis of Variance for Controllability, Low Sales Condition

<u>Source</u>	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Sales level	1	14.38	6.15	0.02
Error	84	2.34		

Panel C: Analysis of Variance for Controllability, High Sales Condition

<u>Source</u>	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Sales level	1	0.01	0.00	0.95
Error	86	1.09		

See Table 1 for descriptions of sales level and controllability.

they considered what the manager's overall evaluation score would be when determining the office administration performance score. Within the low controllability conditions, 40 percent of participants provided ratings of 4 or higher, indicating that they did consider what the overall score would be (mean = 3.0).¹³ To examine whether consideration of the overall score led participants to adjust for controllability in their evaluations, we regress the subjective evaluation score (*SCORE*) on the extent to which participants considered the overall score (*CONSIDER_OVERALL*). We control for participants' perceptions of the quality of the sales measure (*REFLECT_EFFORT*), as participants who believe the sales measure accurately reflects the manager's individual sales efforts are less likely to make a controllability adjustment. We run separate regressions for the low sales, low controllability and the high sales, low controllability conditions since adjustments in those two conditions would likely occur in opposite directions.

The results, presented in Table 3, show a significant positive relationship between consideration of the overall score and the subjective evaluation for participants in the low sales, low controllability condition (column 2). In contrast, there is no effect of consideration of the overall score for participants in the high sales, low controllability condition (column 3). These results support our theory regarding differences in participants' thought processes across the two low controllability conditions. While participants in both conditions considered what the overall evaluation would be, only when the manager's sales *suffered* from an uncontrollable factor did that consideration affect their subjective evaluations.

Participants' primary motivation for adjusting upward for controllability in the low sales, low controllability condition could have arisen from their own personal preferences for justice or from their concerns about the manager's satisfaction and subsequent motivation. That is, uncontrollability that reduces measured performance could cause dissatisfaction because the employee feels the evaluation is unfair and/or because it may reduce compensation. In an effort to explore adjustment

¹³ The mean rating in the high controllability conditions is 2.9, with 32 percent providing ratings of 4 or higher.

TABLE 3
Regression of the Determinants of the Subjective Performance Score in the Low Controllability Condition

$$SCORE_i = \beta_0 + \beta_1 CONSIDER_OVERALL_i + \beta_2 REFLECT_EFFORT_i + \varepsilon_i$$

Variable	<i>SCORE</i> ^a	
	Low Sales	High Sales
<i>CONSIDER_OVERALL</i>	0.24* (1.91)	0.03 (0.45)
<i>REFLECT_EFFORT</i>	-0.30* (-1.84)	0.12 (1.09)
R ²	0.13	0.03

* Denotes statistical significance at the 10 percent level (two-tailed), with t-statistics in parentheses. n = 44 for the low controllability, low sales condition, and n = 46 for the low controllability, high sales condition.

^a The intercept is included, but not separately reported.

Variable Definitions:

SCORE = participants' subjective evaluations of the manager's office administration performance;

CONSIDER_OVERALL = participants' ratings of whether they thought about what the manager's overall evaluation score would be when considering his office administration performance score (measured on a seven-point scale); and

REFLECT_EFFORT = participants' ratings of whether they believed that the manager's individual sales score accurately reflected his individual sales efforts (measured on a six-point scale).

motivations, we directly asked participants whether they used the flexibility (i.e., subjectivity) in their office administration evaluation to "correct" the manager's sales score. A follow-up question asked participants who indicated that they did correct what their primary motivation was. However, only two participants (4.5 percent) in the low sales, low controllability condition indicated that they made a corrective adjustment. This result suggests either that participants were unaware of their corrective adjustments or that they were unwilling to admit that they adjusted. As a result, we are unable to identify the primary motivations underlying participants' adjustments of the subjective evaluations in light of the uncontrollability of the sales measure. While we expect that all of the reasons discussed played a role in the adjustment effect we observe, a greater understanding of their relative importance is a potential avenue for future research.

V. CONCLUSION

We examine how objective measures of performance on one dimension affect supervisors' subjective evaluations of performance on a separate dimension. Our results indicate that supervisors distort information about employee performance to be directionally consistent with an objective measure of a separate task. However, when the objective measure is influenced by uncontrollable factors, we find that supervisors asymmetrically adjust for the resulting unfairness. Specifically, they use the discretion provided for the evaluation of a *separate* task to adjust upward to offset an uncontrollable and unfavorable outcome, but do not similarly adjust downward to offset an uncontrollable and favorable outcome.

Our study highlights the complex nature of subjective performance evaluation, which arises because the effect of discretion can take a number of different forms. Our results suggest that discretion can give rise to cognitive biases for supervisors in some situations, while allowing them to adjust for perceived measurement deficiencies in others. Importantly, we find these effects in a

single-period setting that is free from personal relationships, incentives, or potential confrontations. These real-world features would likely make the effects we observe even stronger in many cases.

Our results have implications for the design of compensation contracts because they reflect a pattern of influence that has not been considered previously. There are many settings in which supervisors have discretion to subjectively evaluate performance that would be difficult to capture using objective measures. However, if supervisors are influenced by cognitive distortion, or if they instead use their discretion to overcome perceived deficiencies in the measurement of other tasks, their subjective evaluations are likely to be uninformative or even misleading. Such effects could have negative consequences in terms of compensation, promotion decisions, training, and motivation. Thus, contract designers who seek to capitalize on the complementary roles of objective and subjective performance evaluation should consider the effects we document here.

It is important to note that, while cognitive distortion could be seen as unambiguously detrimental, corrective adjustment may not necessarily be objectionable from an organizational perspective. Fairness perceptions play a significant role in the motivational effects of performance-evaluation systems (Cohen-Charash and Spector 2001; Colquitt et al. 2001). If supervisors are able to achieve a more fair evaluation outcome by using their discretion to overcome deficiencies in objective measures, then the benefits of increased employee motivation and satisfaction could outweigh the costs of uninformative subjective measures.

To the extent these effects are undesirable, however, a number of possible remedies warrant further examination. For example, it may be possible in some settings for supervisors to gather information and complete their subjective evaluations before observing objective measures of other performance dimensions. This timing adjustment would eliminate the risks of distortion and adjustment. Training evaluators to avoid these influences may also reduce the effects. Another possible approach is to introduce more subjectivity into the compensation contract. Controllability problems are primarily risk problems (i.e., they expose employees to risks beyond their control), and may be best addressed by allowing supervisors to subjectively adjust objective measures to account for uncontrollable events. The provision of additional, “targeted” discretion would prevent the need for supervisors to use discretion designed for one purpose (e.g., to evaluate performance on a particular dimension) to achieve other objectives (e.g., to correct for deficiencies in other areas of the evaluation system). However, greater subjectivity imposes greater costs, and the benefits of these and other interventions must be weighed against those costs.

The limited scope of our experimental setting presents a number of opportunities for future research. For example, all participants received the qualitative information for their subjective evaluations *after* observing the manager’s sales score. Yet the generalizability of the distortion and adjustment results we observe may not be limited to this order of information presentation. Because the qualitative information is ambiguous and confronts the supervisor with a difficult decision under uncertainty, the objective measure (even if observed after the qualitative information is gathered) is still the first numerical value encountered, and could still influence the subjective evaluation. In addition, our experiment involved a one-period setting in which participants’ predispositions could come from only one source (the current-period objective measure). However, in many settings supervisors have prior performance information and/or evaluations from other sources, all of which could provide competing beliefs about the manager. Future research could therefore examine the sensitivity of the effects we observe to the order in which information is presented and to the presence of other information that may affect the supervisor’s predispositions toward the manager.

Participants in our study were not required to justify their evaluation judgments, yet accountability could potentially impact supervisors’ susceptibility to these effects. Additionally, the information about the manager’s office administration performance was limited in our experiment, and was designed to be relatively ambiguous (i.e., it contained both positive and negative signals). Variations in the amount and/or the directional strength of information a supervisor has about an

employee's performance may influence the magnitude of distortion and adjustment effects. Similarly, the directional implication of the uncontrollable factor in our experiment was unambiguous (i.e., it clearly increased or clearly decreased the manager's individual sales). A more general uncontrollability would likely reduce the adjustment effects we observe because conclusions about the appropriate direction of any adjustment would be more difficult to draw. Finally, our experiment required participants to evaluate only a single employee. Yet many supervisors conduct evaluations for more than one employee, and the comparative element of multiple evaluations could affect the role of fairness and motivation. Future research could examine, for example, how supervisors consider issues such as fairness and controllability at the group level (rather than at the individual level) when using discretion in their subjective evaluations.

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