Promote Internally or Hire Externally?
The Role of Trust, Reciprocity, and Performance Measurement Precision

Eric W. Chan
McCombs School of Business
The University of Texas at Austin
eric.chan@mccombs.utexas.edu

Jeremy B. Lill
School of Business
University of Kansas
jeremylill@ku.edu

Victor S. Maas
Amsterdam Business School
University of Amsterdam
vmaas@uva.nl

March 2021

Preliminary draft

We acknowledge helpful comments from Lynn Hannan, Steve Kachelmeier, Lisa Koonce, Michael Majerczyk, Gans Narayanamoorthy, Dan Rimkus, Bei Shi, Ivo Tafkov, Brian White, Michael Williamson, and workshop participants at The University of Texas at Austin, Tulane University, the European Network for Experimental Accounting Research.

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ABSTRACT

Managers often face the choice between promoting an internal employee and hiring an external candidate. Using an incentivized experiment, we examine managers' promote/hire decision and employees' behavior before and after that decision in a setting in which the external candidate has superior ability. Consistent with theory on trust and reciprocity, results indicate that employees invest in costly effort to increase their chances of promotion, and managers reciprocate this effort by promoting them despite their inferior ability. Managers tend to anchor their promote/hire decision on employees' early effort level rather than their sharp increase in effort immediately prior to that decision. Importantly, we predict and find that managers are more likely to promote internally rather than hire externally under a less precise performance measurement system. Results also suggest that promoted (non-promoted) employees who exerted high effort react more positively (negatively) to their managers' promote/hire decision under a more precise system.

I. INTRODUCTION

Staffing decisions are among the most critical decisions made in organizations, as they directly influence who will be responsible for the organization's future. Appointing the right personnel to the job can often make the difference between failure and success (Cannella, Finkelstein, and Hambrick, 2008; Wang, Holmes, Oh, and Zhu, 2016). One important dilemma that organizations constantly face when making staffing decisions is whether they should promote an internal candidate or hire someone from the outside (Chan 1996; Bidwell 2011; DeVaro and Morita 2013). In this paper, we shed light on this dilemma by examining managers' and employees' behavior surrounding a promote/hire decision using an experiment. We predict and find that trust and reciprocity characterize their behavior. Further, we show that the precision of the organization's performance measurement system influences managers' promote/hire decision and employees' response to the decision outcome.

Prior research shows that both internal promotions and external hires are common in practice (e.g., Huson, Parrino, and Starks 2001; Tsoulouhas, Knoeber, and Agrawal 2007; Bidwell 2011). Since the external labor pool is always larger than the internal labor pool , for any vacancy that does not require a highly firm-specific skill set, there will typically be external candidates whose ability level is higher than that of the best internal candidate. Nevertheless, economists have developed various theoretical models showing that internal promotions can exist in equilibrium. For example, there is theoretical and empirical evidence suggesting that the chance of receiving a promotion helps keep internal employees motivated and stimulates investment in human capital acquisition (Chan 1996; Tsoulouhas et al. 2007; Agrawal, Knoeber, and Tsoulouhas 2006; DeVaro and Morita 2013).

While prior research has examined firm-level, economic reasons for why firms may prefer to promote or hire, there is little research on how individual-level, behavioral factors can influence managers' promote/hire decisions. Understanding this is important because managers in practice have substantial discretion when making promote/hire decisions, and thus their decisions could deviate from the firm's preferences and the predictions derived from standard economic theory (e.g., Ferris, Buckley, and Allen 1992; Hoffman, Kahn, and Li 2018; Gustafsson and Swart 2020; Lill, Majerczyk, and Tafkov 2021). Indeed, research shows that managers often follow their social preferences and personal norms in their decision-making (Charness and Kuhn 2011; Maas, van Rinsum, and Towry 2012; Chan 2018). Therefore, we leverage the advantages of an experiment to abstract away many of the previously documented economic factors, allowing us to then isolate the effects of potential behavioral factors that can arise from manager-employee interactions.

Based on fundamental insights from behavioral economics, we theorize that trust and reciprocity play an important role in promote/hire decisions. First, we posit that employees who anticipate that their managers will choose between promoting them and hiring a potentially higher-ability external candidate will put in costly effort to increase their chances of promotion, and that their effort will increase as the promote/hire decision gets closer. There is tension in this prediction because employees' costly effort investment only pays off if managers interpret it as either a gift to reciprocate, and/or a credible signal that employees will continue to exert high effort after promotion to compensate for their ability deficit. Next, we hypothesize that managers will indeed reciprocate employees' effort and thus are more likely to promote those who exert higher effort. Finally, we explore promoted and non-promoted employees' effort after the promote/hire decision to understand how they react to the decision outcome.

Importantly, we examine this interactive cycle (pre-decision effort, promote/hire decision, and post-decision effort) in two different settings: when the organizational performance measurement system is more or less precise. When the system is more precise, managers can observe relatively accurate indicators of employee effort. On the contrary, when a system is less precise, the best available indicators of employee effort are noisy and partly uncontrollable by the employee (Hölmstrom 1979; Banker and Datar 1989; Feltham and Xie 1994). Prior research finds that performance measurement precision can affect managerial decision-making in various contexts, such as outsourcing (Bai, Coronado, and Krishnan 2010) and subjective evaluations (Bol, Kramer, and Maas 2016). We predict that the performance measurement precision will also affect managers' promote/hire decision and employees' response to the decision outcome.

Under a performance measurement system where signals of effort are less precise, working hard to secure a promotion is a riskier strategy for employees. We reason that employees will either accept that promotion is unlikely and reduce their effort because the signal of their effort is obfuscated, or instead further increase their effort to ensure that a high signal of their effort will be observable by their manager even with a noisy performance measure. More importantly, we hypothesize that managers are more likely to promote internally than to hire externally under a less precise system. Specifically, we posit that when employees give low effort, managers under a less precise system are more likely to give them the "benefit of the doubt" and promote them even when managers observe low signals of employee effort. The reason is that the norms of gift exchange will cause managers to feel worse about not promoting a good employee than promoting a mediocre employee.

We test our theory using an incentivized online experiment. The participants are 138 business school students from a large public university in the U.S. The experiment consists of

two stages, each comprised of three periods. In stage one, an employee and a manager form a firm, and they are both informed that the manager will make a promote/hire decision at the end of the first stage. The employee selects an effort level in each of the three initial periods. Higher effort levels are more costly to the employee but produce higher expected output for the manager. The manager learns the internal employee's output in each period of stage one.

In stage two, a new higher-level position becomes open. Compared to the internal employee's original position, this new position pays higher compensation and employee effort in this position has a larger effect on output. The manager must choose to either promote the internal employee or hire a new employee from the outside to fill the vacant higher-level position. The manager learns that the external employee's cost of effort is always lower than that of the existing employee, which proxies for their differences in ability. After the manager makes the promote/hire decision, the employees select their effort levels in each of three later periods.

We use a between-participant design to manipulate performance measurement system precision by either supplementing or not supplementing the manager's noisy output signal with a precise indicator of employee effort. That is, the manager either observes employee effort and a random noise factor separately (precise), or only observes the sum of the two (imprecise).

The results support our predictions. Employees provide costly effort to induce managers to promote them, and effort increases as the promote/hire decision becomes more imminent. That is, employees anticipate managers will engage in gift exchange and reciprocate their effort by promoting them, even though the external candidate has higher ability. We also find that managers' likelihood of promoting internally rather than hiring externally increases as their employees' chosen level of costly effort increases, regardless of the precision of the system. Interestingly, we find that managers base their promotion decision on employees' early effort

level rather than on their sharp increase in effort immediately prior to the promote/hire decision. Consistent with our theory, we find that managers are more likely to promote internally under a less precise system, and this result is driven by differences in the promotion of employees who exerted relatively low effort. Finally, results suggest that under a more precise system, promoted employees who exerted high effort are more likely to continue to put forth costly effort after promotion, but those who are passed over for promotion reduce their subsequent effort to a greater extent than under a less precise system.

Our study makes several contributions to theory and practice. First, our study contributes to the literature on internal promotion versus external hiring that has emerged in economics and finance (e.g., Chan 1996; Tsoulouhas et al. 2007; Jongjaroenkamol and Laux 2017).[1] Unlike prior studies, we adopt a behavioral as opposed to a conventional economic perspective, and we focus on middle managers as opposed to top executives. Our findings highlight that promote/hire decisions cannot be fully understood without taking into account that employees and managers factor in their own, and anticipate each other's, social preferences. Specifically, we find that managers' desire to reciprocate an internal employee's prior efforts drive their decision to promote that employee over a higher-ability external candidate. Thus, we provide alternative reasoning for the empirical observation that firms often favor internal promotions (Agrawal et al. 2006). Our findings also add to the emerging literature examining how managers' social preferences and own interests drive their promotion decisions (Chan 2018; Hecht et al. 2020).

[1] While we focus on internal promotion versus external hiring, we believe our results could generalize to other settings where a manager is deciding whether to promote an employee whom the manager has a prior work relationship versus someone whom the manager does not (e.g., employee from same versus different team within the same firm). We believe the key factor underlying our theory is that the manager has previously benefited from the efforts of the employee, giving rise to the possibility of gift exchange in their interactions.

Second, we contribute to the literature on the performance measurement system design by examining the effects of precision in a promote/hire setting. Agency theory predicts that improving performance measurement precision will enhance contracting efficiency (e.g., Banker and Datar 1989; Feltham and Xie 1994), and prior research finds that precision can affect various outcomes, including the allocation of decision-making authority (Moers 2006), outsourcing (Bai et al. 2010), and performance evaluations (Bol, Kramer, and Maas 2016). However, we predict that precision can also have unanticipated effects on managers' promotion decisions and employees' response to the decision outcome. Our results indicate that less precise performance measurement will lead to more internal promotion over external hiring. Although less precision prompts managers to place more trust in their employees, we also find that employees are less likely to reciprocate their managers' trust by "hiding" behind the noise of a less precise system.

Lastly, we contribute to the literature on gift exchange in superior-subordinate relationships. Prior research shows that managers often initiate trust by offering favorable contracts to employees who then reciprocate by increasing their effort (Hannan 2005; Kuang and Moser 2009) and reducing dysfunctional behavior (Zhang 2008; Chen and Sandino 2012). We show that in a promotion setting in which the reward is implicit and uncertain, employees initiate trust by exerting costly effort for their managers who then reciprocate by promoting them.

II. BACKGROUND

Internal Promotion versus External Hiring

Prior research, mainly in the fields of labor economics, management, and human resources, has documented various benefits and costs pertaining to the decision to either promote

internally or hire externally.[2] Compared to hiring externally, the benefits of promoting internally include: 1) saving the administrative costs associated with attracting, screening, and hiring external candidates (Oyer and Schaefer 2010), 2) saving the wage premiums typically paid to hire external candidates (Bidwell 2011; Kampkötter and Sliwka 2014), 3) preserving current employees' promotion-based incentives to exert effort and acquire human capital (Lazear and Rosen 1981; Rosen 1986; Chan 1996), and 4) retaining employees who have accumulated valuable, firm-specific knowledge (Naveen 2006; Chadwick and Dabu 2009). Given these reasons, evidence suggests that firms generally favor internal candidates and tend to "handicap" external candidates, such that external candidates are only hired when they are markedly superior to the best internal candidate (Chan 1996; Agrawal et al. 2006; Tsoulouhas et al. 2007).

Although internal promotions are generally more common, we observe in practice that external candidates are frequently hired over internal candidates (Gregory-Smith and Wright 2009; Bidwell 2011). This can be explained by the fact that the external labor pool is almost always larger than the internal labor pool, and thus there are likely talented external candidates available with superior abilities and work experiences (Rao and Drazin 2002; Rosenkopf and Almeida 2003; Bidwell and Keller 2014; Williams, Lien-Chen, and Agarwal 2017). Empirical evidence supports this general notion, suggesting that external hires tend to rise through the ranks more quickly than their internally promoted counterparts (Acosta 2010; Bidwell 2012).

Unlike prior research, our study focuses on understanding the behavioral factors that arise from the interactions between employees and managers at the individual level in a promote/hire setting. In addition, we introduce the precision of the performance measurement system as a

[2] Organizations can also fill open job positions through lateral transfers. However, lateral transfers create other vacant positions that the organization will eventually need to fill either by promoting internally or hiring externally.

potential factor that can influence employees' and managers' behavior surrounding the promote/hire decision.

Performance Measurement System Precision

In the agency theoretical framework, precision is one of the key dimensions of an organization's performance measurement system. It captures the extent to which "noise" in the performance measures obfuscates the agent's actions (Feltham and Xie 1994; Krishnan, Luft, and Shields 2005). That is, a more precise system can better capture an agent's actions by separating out extraneous factors and events outside of the agent's control.

Numerous factors influence the precision of a performance measurement system, such as an organization's investment in information technology, the task environment, and performance outcomes interdependencies. Under agency theory, imprecision is costly because it imposes additional risk on the agent, and therefore the principal must pay a risk premium to motivate agents' effort. As such, economic theory prescribes that more precise measurement systems are desirable because they can incentivize agents more effectively and efficiently (Hölmstrom and Milgrom 1991; Baker 1992, 2002). Surprisingly though, recent experimental research has found that agents can sometimes exert *more* effort in a noisier environment because of loss aversion and their desire to insure against large negative noise (Sloof and van Praag 2010; Corgnet and Hernan-Gonzalez 2019). Unlike these prior studies, our focus is not to examine the direct effect of performance measurement precision on employee effort, but rather how precision affects managers' promote/hire decision and employees' anticipation of and responses to that decision.

III. HYPOTHESES DEVELOPMENT

Economic Baseline Prediction

We develop our hypotheses in a setting where a manager decides between promoting an internal employee versus hiring an external candidate whose ability level is higher (i.e., generate higher output at the same cost of effort). The latter's higher ability is a critical assumption that captures the necessary tension and real-world dilemma inherent to the promote/hire decision (Chan 1996; Agrawal et al. 2006; Tsoulouhas et al. 2007). Further, we abstract away from our setting certain previously identified economic factors that can affect managers' promote/hire decisions, such as screening costs, wage premiums, and future promotion-based incentives, to allow us to derive the basic standard economic predictions and thereby isolate the behavioral factors that may cause managers and employees to deviate from such predictions.

Specifically, holding all else equal, standard economic reasoning in our setting predicts that rational managers should always hire the external candidate whose expected output will be higher than that of the internal employee. This is because the incentive structure for the open position is identical, regardless of whether it is filled through an internal promotion or an external hiring, and thus will motivate the same level of effort from rational employees. Given the same cost of effort, the higher-ability external candidate will generate higher expected output than the internal employee. As a result, the internal employee has no incentive to give any extra effort *before* the promote/hire decision because doing so is neither a credible signal of their future effort after promotion nor does the manager have an incentive to reward employees for their past effort.[3]

[3] One possible way to motivate the internal employee to give costly effort before the promote/hire decision is for the manager to commit to promoting that employee rather than hire externally, if the employee meets a specific output threshold. However, such formal commitments for internal promotions are rare in practice, and if the commitment is informal (i.e., cheap talk), the manager has incentives to renege later, resulting in what Waldman (2003) describes as the "time-inconsistency problem" whereby the manager's optimal promotion rule changes over time.

Employee Effort before Promote/Hire Decision

Contrary to the above economic predictions, we posit that social preferences for trust and reciprocity will motivate employees to exert costly effort to increase their chance of promotion. Prior research has documented many situations where trust and reciprocity (or equivalently, gift exchange) arise between managers and employees to affect their decision-making and outcomes (e.g., Rabin 1993; Fehr and Gachter 2000; Falk and Fischbacher 2006; Chan and Lill 2021). For example, multiple studies show that when managers offer the gift of a wage above the market-clearing level, employees often reciprocate with the gift of higher effort that benefits the managers (Fehr, Kirchsteiger, and Riedl 1993; Hannan 2005; Kuang and Moser 2009).

While prior studies have primarily examined situations where managers initiate trust and then employees reciprocate accordingly, in the context of a promote/hire decision, employees are the ones who can initiate trust by exerting costly effort with the expectation that managers will reciprocate by promoting them instead of hiring the external candidate. Specifically, we predict that employees' decision to exert costly effort before the promote/hire decision can have two potential effects: a gifting effect and a signaling effect.

First, exerting costly effort establishes the employees' "gift" to their managers since employees bear the full cost of effort, while managers gain the full benefit. The fact that there is no alternate way to recoup their incurred cost of effort, besides their managers' decision to promote them to a higher-paying position, further reinforces employees' trust. Second, employees' willingness to exert costly effort can act as a signal that they will continue to exert high effort after promotion, which can potentially compensate for their ability deficits compared to the external candidate. In either case, we predict that employees will be motivated to exert costly effort *before* the promote/hire decision to increase their likelihood of promotion.

In addition, we predict that as the promote/hire decision becomes more imminent, employees will further increase their costly effort to make their gifting motivation more apparent to their managers. That is, employees will exert the highest levels of costly effort immediately before the promote/hire decision. However, we note that reinforcing the gifting effect in this way could potentially come at the cost of reducing the signaling effect if managers interpret the employees' "last-minute" increase in effort as a temporary, strategic action that is unlikely to be sustained after the employees are promoted (Milgrom and Roberts 1988). Nevertheless, we expect employees to ramp up their effort levels based on their belief that this will further convince their managers to promote them.

We expect these predictions to hold regardless of the precision of the performance measurement system, as long as employees' effort remains consequential to their managers. That is, even under a less precise system, we expect the gifting and signaling effects described earlier to still manifest, as long as any random noise does not dominate and completely nullify the effect of employees' effort on their managers' payoffs. Although it is not our objective to compare employees' effort under a more or less precise system, we reason that employees could respond in two opposing ways. They could either reduce their effort because they believe the random noise will obfuscate the signal of their effort, or they could increase their effort further to ensure that their signal will be observable by their managers even in the most unfavorable circumstances (i.e., large negative noise).

Overall, based on our above reasoning, the two parts of our hypothesis are as follows:

H1a: Employees will exert costly effort before the promote/hire decision.

H1b: Employees will increase their effort as the promote/hire decision becomes more imminent.

Managers' Promote/Hire Decision

After managers observe more or less noisy signals of employees' effort under different levels of performance measurement precision, they must decide whether to promote their internal employee or hire the external candidate with higher ability. Based on our earlier discussion, we expect managers will often choose to promote their employees despite their lower ability either because managers want to respond in kind to their employees' "gift" of exerting high costly effort (i.e., gifting effect), or because they believe their employees will continue to exert high effort after being promoted (i.e., signaling effect). Importantly, managers' decision to promote internally rather than hire externally is contingent on their employees exerting high effort levels before they make the decision. Thus, the first part of our second hypothesis is as follows:

> **H2a:** Managers are more likely to promote internally rather than hire externally when employees exert higher effort before the promote/hire decision.

We next consider the effects of precision of the performance measurement system on managers' promote/hire decision. While we expect H2a to generally hold regardless of precision, we predict that there will be differences in managers' promotion decision in some cases. Specifically, we expect precision to have minimal effects on managers' decision when managers observe signals of relatively high output due to high employee effort, which will likely result in their promotion. However, when employees provide a relatively low level of effort, we expect precision does matter.

Under a more precise system, managers can better observe their employees' low effort levels and potentially decide that it does not meet their minimum standard for promotion. This can be because the low effort does not represent a sufficiently large gift, and/or signals that future effort will likely be lower than the effort of the higher ability external candidate. In

contrast, under a less precise system, managers observe noisier signals of employees' effort, which managers can either attribute to their real underlying effort or to the random noise.

If managers desire to hire the higher ability external candidate, they will attribute high output to positive noise and low output to employees' low effort. This is consistent with self-serving bias that enables individuals to justify decisions that maximize their payoffs (Thompson and Loewenstein 1992; Wade-Benzoni, Tenbrunsel, and Bazerman 1996; Arnold, Hannan, Tafkov 2018, 2020). However, prior literature has also found that individuals often give others the "benefit of the doubt" when facing uncertainty, and this effect is strengthened by the social bond between individuals (Ganzach and Krantz 1991; Kachelmeier and Van Landuyt 2017).

Since managers and employees work in a cooperative environment where social bonds naturally exist, we predict that rather than act self-servingly, managers will give employees the "benefit of the doubt" and assume employees exerted high effort, even if managers observe a low signal and employees' true effort is low. Further, we reason that managers in this setting have particularly strong preferences to ensure that they maintain their end of the social contract of gift exchange because they have previously benefited from their employees' effort. As a result, this will cause managers to feel worse about not promoting a good employee than about promoting a mediocre employee.

Taken together, we predict that managers will be more likely to promote employees who exerted relatively low levels of effort under a less versus more precise performance measurement system. Thus, the second part of our second hypothesis is as follows:

> **H2b:** When employees exert relatively low effort before the promote/hire decision, managers are more likely to promote internally rather than hire externally when the performance measurement system is less precise.

Employee Effort after Promote/Hire Decision

Finally, we explore promoted and non-promoted employees' effort after the promote/hire decision when there are no subsequent promotions in the horizon. This situation arises frequently because organizations typically have a finite number of available positions, and there is often a lot of uncertainty about when future promotions will occur again when all vacant positions have been filled (DeVaro 2006).

There are several opposing factors and scenarios that can affect the effort choices of those who receive promotion and those who do not. For the promoted employees, they can decide to continue exerting high effort to extend the gift exchange relationship because they view their managers' promotion as a sign of trust that should be further reciprocated. Alternatively, promoted employees can decide to reduce their effort after promotion because they view their managers' promotion as a reward for their previous hard work and thus rationalize that their social contract of gift exchange with their manager has been fulfilled.

For the non-promoted employees, they are unlikely to exert high effort since there are no future economic benefits to do so. Even so, within the range of possible low effort levels, employees can decide whether to exert some minimal effort, give none at all, or even sabotage to punish their managers for passing them over for promotion. Whether non-promoted employees decide to punish their managers likely depends on the extent to which they feel they deserved the promotion. Some non-promoted employees may accept that the external candidate deserved the promotion because of their higher ability. Other employees, especially those who exerted costly effort before the promote/hire decision, may believe they deserved the promotion and react in a negative, retaliatory way.

While the above arguments can be reasonably made under a more or less precise performance measurement system, non-promoted employees could react relatively *less* negatively under a less imprecise system because of managers' inability to directly infer their past costly effort. Thus, in cases where the random noise is negative and employees' observed output is low, employees could find it understandable for their managers not to promote them.

Overall, given the many different factors that can affect promoted and non-promoted employees' effort after the promote/hire decision, we leave this as an open empirical question:

RQ: What effort will promoted and non-promoted employees choose to exert after the promote/hire decision?

IV. METHOD

Participants

We recruit participants from a participant pool of mainly business school students at a large U.S. public university.[4] We collect the data remotely using the LIONESS software program (Giamattei et al. 2020).[5] In total, 138 individuals participated in one of six sessions that lasted approximately 60 minutes. Participants receive a show-up fee of $5 in addition to the payoffs from the experiment. In total, participants earned an average of $18.61. Participants are on average 21 years old, and 75 percent are female.

Experimental Setting

In our setting, a manager and an employee form a single firm. They interact over two stages, each comprising three work periods, and they earn points that convert to U.S. dollars at a

[4] The university's Institutional Review Board reviewed and approved the experiment.
[5] Each remote session takes place in a Zoom meeting room. At the start of each session, a facilitator gives an overview of the experiment procedure and provides the link to the LIONESS instrument. During the sessions, the participants' video and private chat functions are disabled and participants replace their name on Zoom with a randomly assigned participant number to ensure anonymity during the experiment.

rate of 160 points per U.S. dollar. During each period, the employee's task is to select a level of effort. As shown in Panel A of Table 1, possible effort levels range from 0% to 100% in 5% increments. Effort levels from 0% to 20% are costless to the employee, but for each effort level beyond 20%, the cost of effort increases by 5 points.

[Insert Table 1]

Including a fixed wage, the employee's payoff formula for each period in stage 1 is:

Employee's Payoff = Fixed Wage [200 points] – Cost of Effort [0 to 80 points]

The employee's selected effort level is summed with a random noise factor to determine the employee's output, which is then multiplied by a fixed multiplier to determine the manager's payoff. The noise factor ranges from -40% to 40% in 5% increments and is randomly drawn for each work period.[6] The manager's payoff is capped at zero for any given period to avoid negative payoffs. The manager's payoff formula for each period in stage 1 is:

*Manager's Payoff = (Employee's Effort Level [0 to 100%] + Random noise factor [-40% to +40%]) * Fixed Multiplier [400 points]*

At the end of stage 1, a new higher-level position becomes open and the manager must fill the new position either by promoting the current employee or hiring an external candidate. As shown in Panel B of Table 1, compared to the employee, the external candidate's cost of effort is 10 points lower at each effort level. Thus, effort levels from 0% to 30% are costless to the external candidate. This difference in the effort-cost tables proxies for the external candidate's superior ability over the employee. If the external candidate's ability were the same or inferior to the employee, then the manager would generally prefer to promote internally over hire

[6] We used a random draw to determine the noise term for each work period prior to running the experiment and use the same set of noise terms across all conditions and sessions. This eliminates the possibility that differences in the noise term drive our results across conditions. The probability of selection was equal and independent for all possible noise terms. The six selected noise terms are 30%, -40%, 10%, 15%, 0%, and -10%, for work periods 1 through 6, respectively.

externally. Both the manager and employee see the external candidate's effort-cost table when the manager makes the promote/hire decision to eliminate any ambiguity about the external candidate's advantage over the employee.

Compared to the employee's original position, the new higher-level position pays a higher fixed wage (i.e., 400 versus 200 points) and the employee's output has a larger effect on the manager's earnings (i.e., fixed multiplier of 800 versus 400 points). This structure makes the promotion attractive to the employee, and it incentivizes the manager to staff the higher-level position with the individual who will exert relatively higher effort. To hold constant the firm size after the promote/hire decision, if the manager decides to promote the current employee, then the external candidate fills the promoted employee's original lower-level position.[7] If the manager hires the external candidate for the higher-level position, then the original employee remains in the same position.

As such, in addition to the employee payoff formula shown above for the employee in the lower-level position, the payoff formula for the promoted or newly hired employee in the higher-level position for each stage 2 period is:

Higher-level Employee's Payoff = Fixed Wage [400 points] – Cost of Effort [0 to 80 points]

Similarly, the manager's payoff formula for each stage 2 period will include the following additional payoff generated by the employee in the higher-level position:

*Manager's Payoff = (Higher-level Employee's Effort Level [0 to 100%] + Random Noise Factor [-40% to +40%]) * Fixed Multiplier [800 points]*

[7] We make the design choice to keep the firm size constant regardless of the managers' promote/hire decision for operationalization purposes to balance the payoffs resulting from the decision. As explained later, the external candidate never learns about the two different positions and the wage differentials, minimizing the effects of this role. Because our focus is not on the external candidate, we do not theorize or attempt to generalize the behavior of the external candidates in our experiment.

Within this setting, we manipulate the precision of the performance measurement system (*Precise* versus *Imprecise*). In the *Precise* condition, the manager separately observes the employee's selected effort level and the random noise factor at the end of each work period. In the *Imprecise* condition, the manager only observes the sum of the employee's selected effort level and the random noise factor (i.e., employee's output) and therefore cannot directly infer whether changes in output are due to changes in effort or noise.

Detailed procedures

Participants begin by learning their role, reading the instructions, and completing a series of short quizzes to ensure their comprehension. Participants then complete the detailed steps of the experiment described below. After all participants finish the experiment, they complete a post-experiment questionnaire.

After the instructions and quizzes, participants answer five general knowledge trivia questions.[8] This trivia task serves as a social bonding exercise to help establish the manager-employee relationship by allowing for some level of interaction and cooperation that characterizes a typical work environment (Kachelmeier and Van Landuyt 2017).[9] To prevent the trivia task outcome from influencing participants' decision-making in the main task, participants do not learn the trivia answers nor their earnings from the task until the end of the session.

After completing the trivia task, participants proceed to the six work periods described above. Recall that during each period, the employee chooses an effort level that is summed with

[8] The trivia questions are multiple-choice, image-based questions. For example, participants see an image of the Machu Picchu ruins with the question "Where is this landmark?" This prevents participants from copying and pasting a text-based trivia question into a search engine. Participants have 30 seconds to answer each question.

[9] For each trivia question, the manager and employee first provide an initial answer and report their level of confidence in that answer. They then see each other's initial answer and confidence level before independently selecting their final answers. If either the manager or employee correctly answers the trivia question, they both receive 60 points. Thus, if they both answer the question correctly, they receive 120 points. The external candidate answers the same five trivia questions and receives 120 points for each correct answer without any help from others.

a random noise factor to determine the employee's output and manager's payoff. At the end of stage 1 (i.e., first three work periods), the manager decides whether to fill a new higher-level position by promoting the original employee or hiring the external candidate whose cost of effort is lower than that of the employee. After the promote/hire decision, the employee and external candidate perform the same effort selection task in stage 2 (i.e., last three work periods).

Key Design Features

Several design features of the experimental setting are worth elaborating. First, we have employees perform an effort selection task as opposed to a real effort task to 1) better capture the personal cost of effort, 2) separate the potential confounding effects of effort and ability, 3) maintain greater experimental control over the parameters and payoff functions, and 4) better able to attribute effort decisions to their intentions. One consequence is that because employees' ability is assigned and not "earned" under our effort selection task, they are less likely to feel "entitlement" over their ability (Naumann, Minsky, and Sturman 2002). However, since our theory does not rely on the perceived fairness related to the promotion decision and its criteria, this design choice seems unlikely to affect our results.

Second, the employee only learns the random noise factors of the previous three work periods at the end of stage 1 and the end of stage 2. This eliminates the possibility that the noise factor influences the employee's effort selection. Further, we pre-select and hold constant for all firms and conditions the random noise factors. Third, before the first work period begins, the employee learns that the manager will make the promote/hire decision at the end of stage 1. However, the employee and manager do not learn the external candidate's effort-cost table until the end of stage 1. This reflects practice where there is typically shared knowledge about the timing of staffing a vacant position, but the details of specific external candidates' profiles are

unknown until later when the decision is more imminent. Fourth, the external candidate earns a fixed wage of 150 points in each of the stage 1 work periods, which is lower than the fixed wage in both the lower- and higher-level positions. The external candidate never learns about the two different positions and the wage differentials. This design minimizes the role of the external candidate in affecting the manager's promote/hire decision. That is, the external candidate should be similarly pleased to be assigned to either position.

V. RESULTS

We first discuss summary statistics and then test our hypotheses and our research question. Table 2 provides a list of all variables in this section. For expositional ease, we refer to the original, internal employee as the "employee" throughout our results section below.

[Insert Table 2]

Summary statistics

Panel A of Table 3 and Figure 1 present the trend of employee effort across work periods for the *Precise* and *Imprecise* conditions. We observe that employees in both conditions choose costly effort both prior to and after the promotion decision. We also observe that effort levels increase as the promotion decision gets closer, peak in the period immediately prior to the promotion decision (i.e., period 3), and then decrease afterwards. This pattern of sharp increase and drop off in effort appears to be stronger in the *Precise* than in the *Imprecise* condition.

[Insert Figure 1 and Table 3]

Panel B of Table 3 provides the outcome of the promote/hire decision across the *Precise* and *Imprecise* conditions. In total, the internal candidate receives a promotion 54.3% of the time. However, promotions occur more often under an imprecise versus precise performance measurement system (66.7% vs. 40.9%). Panel C provides employees' effort contingent upon

whether or not they were promoted. We observe that average effort levels for stage 1 (i.e., first three work periods) are higher for employees who end up being promoted compared to employees who do not (47.9% vs. 34.0%). Further, promoted employees choose higher effort levels in the last three work periods after the promote/hire decision as compared to non-promoted employees (39.9% vs. 27.0%).

Test of Hypotheses – Employee Effort before the Promote/Hire Decision (H1a and H1b)

We first examine whether employees give costly effort before the manager makes the promote/hire decision (H1a). Panel A of Table 4 reveals that for all work periods prior to the promote/hire decision, employees choose significantly higher effort levels than the highest *costless* effort choice of 20% (all $t \geq 4.02$; all $p < 0.01$), supporting H1a.[10,11]

[Insert Table 4]

To provide further support for the notion that employees are increasing their costly effort beyond what they believe is required of them, we compare the employees' average level of costly effort in periods 1-3 (*Pre-Decision Effort*) to external candidates' average level of costly effort in periods 4-6 (*Post-Decision Effort*). Recall that an external candidate joins the firm after the promote/hire decision and can choose to exert costly effort that benefits the manager, even though there are no future promotion opportunities. Therefore, we use the external candidates' effort after joining the firm as a baseline to compare employees' pre-decision effort.[12] Panel B of Table 4 reveals that employees choose higher levels of costly effort prior to the promotion decision compared to external candidates' costly effort upon joining the firm (21.6% vs. 12.9%; t

[10] All reported *p*-values are two-tailed.
[11] Results are inferentially the same when using a Wilcoxon signed-rank test to test the median ($z = 5.78$; $p < 0.01$).
[12] Given our focus on the employee and manager, we intentionally design our experiment to minimize the likelihood of external candidates putting forth different effort levels across conditions by not informing them of the higher and lower level position (and the corresponding pay difference) and by not creating any incentive to put forth costly effort. For completeness, we run an ANOVA with candidate effort as the dependent variable and *Precision* and *Promote* as the independent variables. We find no main effects and no interaction effect (all $p \geq 0.37$).

= 2.59; $p = 0.01$).[13] The pattern is consistent when splitting the sample across the *Precise* and *Imprecise* conditions (both $p \leq 0.11$). Overall, these results further support our theory for H1a.

We next examine whether employees increase their effort as the promote/hire decision becomes more imminent (H1b). Figure 1 provides visual evidence consistent with H1b as effort levels increase monotonically and peak at Period 3 under both a precise and imprecise measurement system. To formally test H1b, we perform a repeated measures ANOVA using effort in periods 1-3 as the dependent variable, and indicator variables for performance measurement precision (*Precision*) and time periods (*Period*). Consistent with H1b, Panel C of Table 4 shows a significant effect for *Period* in the ANOVA (F = 4.64; $p = 0.01$). Additional t-tests show that period 3 effort is higher than both period 1 and period 2 effort (47.1 vs 37.7 and 40.0; t = 2.88 and 2.28; $p < 0.01$ and $p = 0.03$, respectively, untabulated). These results provide further support for H1b.

Next, we use the post-experimental questionnaire to gain better understanding of employees' rationale for increasing effort before the promote/hire decision. We ask employees the extent to which their pre-decision effort choice is driven by the factors: "I wanted to increase my chances of being promoted by my supervisor" and "I wanted my supervisor to know that I chose high effort levels." Employees responded on a 7-point Likert Scale with 1 = "Not at all", 4 = "Moderately" and 7 = "Very much". We average the responses to the two questions and label this as their *Promotion Signal*. We next create an *Effort Trend* variable to measure the increase in employee effort from period 1 to 3, with higher values indicating a larger increase.[14] We find that *Promotion Signal* and *Effort Trend* are marginally positively correlated (r = 0.21; $p = 0.15$).

[13] To calculate *costly* effort, we subtract the costless effort level (i.e., 20% for employees and 30% for candidates) from the chosen effort level.
[14] *Effort Trend* has a range of -35% to +70%, and the mean (std. dev.) is 9.34% (22.1%).

Consistent with theory, these results suggest that employees believe that increasing their effort sharply in the period immediately preceding the promote/hire decision will help increase their chances of being promoted.

Test of Hypotheses – Managers' Promote/Hire Decision (H2a and H2b)

Our second set of hypotheses focuses on managers' promote/hire decision. H2a predicts that managers are more likely to promote internally rather than hire externally when employees exert higher effort before the promote/hire decision. To examine this, we perform a logistic regression with a dichotomous dependent variable (*Promote*) coded 1 (0) if the manager promotes the employee (hires the external candidate) to the higher-level job, and *Pre-Decision Effort* as the independent variable. Consistent with H2a, we observe a significant positive coefficient for *Pre-Decision Effort* in Model 1 of Table 5 (coef. = 0.06; z = 2.63; $p < 0.01$), indicating that the manager's likelihood of promoting internally increases as the employee chooses higher effort. In Model 2, we include the *Precision* variable and find that it is negatively associated with employee promotion, suggesting that managers are more likely to promote under an imprecise versus precise system (coef. = -1.63; z = -2.19; $p = 0.03$). However, the coefficient for *Pre-Decision Effort* remains positive and significant (coef. = 0.08; z = 2.83; $p < 0.01$). Overall, these results provide support for H2a.

[Insert Table 5]

We next examine whether managers' likelihood of promoting internally rather than hiring externally is higher under an imprecise versus precise system when their employees' chosen level of costly effort is relatively low (H2b). To test this, we include the interaction term *Pre-Decision Effort* × *Precision* in the logistic regression described earlier. Model 3 of Table 5 shows marginal support for H2b (coef. = 0.10; z = 1.58; $p = 0.11$). However, additional analysis reveals

a main effect for gender in the promotion decision. Specifically, independent of other effects, males are less likely to promote compared to females (31.3% vs. 66.7%; t = 2.39; $p = 0.02$, untabulated). Therefore, we include an indicator variable coded 1 for males, 0 for females (*Gender*) and rerun the regression. Model 4 reveals that, controlling for gender, *Pre-Decision Effort* × *Precision* is significantly associated with *Promote* (coef. = 0.14; z = 1.94; $p = 0.05$).

Figure 2 provides a visual representation of the interaction. On the y-axis is the probability of promotion, on the x-axis is average effort level across the first three work periods. We observe that with relatively low effort (i.e., all effort levels less than 45%), employees are significantly more likely to receive a promotion under an imprecise versus precise system (all $p \leq 0.04$, untabulated). However, for effort levels at or above 45%, there is no difference in promotion likelihood between a precise and imprecise performance measurement system (all $p > 0.25$, untabulated). Overall, these results provide support for H2b.

[Insert Figure 2]

To further understand what drives managers' promote/hire decisions, we next examine the extent to which managers consider employees' effort in each work period, their change in effort from period 1 to 3 (H1b), or both. We use the same logistic regression, but decompose *Pre-Decision Effort* into *Period 1 Effort, Period 2 Effort, and Period 3 Effort*. As shown in Models 5 and 6 of Table 5, managers appear to anchor on employee's effort in the first period. In particular, we find that *Period 1 Effort* is positively associated with the likelihood of promotion both without and with *Gender* and *Precision* (coef. = 0.19 and 0.21; both $p = 0.10$), but there is no significant effect for *Period 2 Effort* and *Period 3 Effort.* As a robustness test, we run the same analysis, but we replace *Period 2 Effort* and *Period 3 Effort* with the change in effort from period 1 to 2, and from period 2 to 3, respectively. In untabulated results, we again find that

Period 1 Effort is positively associated with the likelihood of promotion both without and with controls (both coef. = 0.33; $p = 0.02$ and 0.03, respectively), but the change in effort for the subsequent two periods are both insignificant (all $p \geq 0.22$). Together, these results suggest that managers anchor on employees' initial effort rather than on the sharp increase in effort immediately prior to the promote/hire decision.

Test of Research Question – Employee Effort *after* the Promote/Hire Decision

We now examine employee effort levels after the promote/hire decision. As shown in panel A of Table 6, we find that promoted employees choose higher effort both before (47.9% vs. 34.0%; t = 3.02; $p < 0.01$) and after (39.9% vs. 27.0%; t = 2.31; $p = 0.03$) the promote/hire decision. Panel C of Table 2 from earlier shows that this pattern is consistent across both the *Precise* and *Imprecise* conditions, but hints at an interaction. Specifically, the changes in effort after the promotion decision are relatively small (large) under an imprecise (precise) system. We examine this in more detail by running an OLS regression with *Post-Decision Effort* as the dependent variable and *Pre-Decision Effort* and *Precision* as mean-centered independent variables. For these analyses, we split our sample by promoted versus non-promoted employees.

[Insert Table 6]

As shown in Panel B of Table 6, we find no effect for promoted employees, as all factors in the regression are non-significant (all $p \geq 0.59$). However, for non-promoted employees, we find a significant *Precision* × *Pre-Decision Effort* interaction (t = -2.26; $p = 0.04$). Panel A of Figure 3 provides a graphical representation of the interaction with *Pre-Decision Effort* on the x-axis and *Post-Decision Effort* on the y-axis. We observe that under an imprecise system, non-promoted employees do not change their effort decisions after being passed over for promotion. That is, *Post-Decision Effort* is highly positively correlated with *Pre-Decision Effort* for these

employees (r = 0.72; p = 0.04, untabulated). We conjecture that under an imprecise system, employees recognize that managers only observe noisy signals of their effort and thus find it understandable for their managers not to promote them in this environment. As a result, employees continue to put forth consistent effort even after being passed over for promotion. However, under a precise system, non-promoted employees drop their effort to a low level, regardless of their pre-decision effort. Specifically, we find that *Pre-Decision Effort* is not significantly correlated with *Post-Decision Effort* (r = -0.17; p = 0.57, untabulated). Thus, non-promoted employees appear to react more negatively to being passed over for promotion by always reducing their effort under a more precise performance measurement system.

[Insert Figure 3]

As described earlier, employees not only control the overall level of pre-decision effort, but also whether to increase their effort over time before the promote/hire decision. This effort trend is important given our earlier H1b findings that employees sharply increase their effort as the promotion decision gets closer. Based on this result, we re-run the OLS regression with *Post-Decision Effort* as the dependent variable and *Pre-Decision Effort*, *Effort Trend*, and *Precision* as the mean-centered independent variables. Panel C of Table 6 presents the results.[15]

For promoted employees, we find that the *Precision* × *Effort Trend* interaction is significant (t = 2.36; p = 0.03). Panel B of Figure 3 provides a graphical representation of the interaction. Under a precise system, we find that *Effort Trend* is significantly and positively associated with *Post-Decision Effort* (t = 2.12; p = 0.05, untabulated). This result suggests that under a precise system, promoted employees who increase their effort sharply immediately prior

[15] Although our focus is on promoted employees here, we also provide the results for non-promoted employees. We observe that the interaction of *Effort Trend* and *Precision* is not significant (p = 0.99). We continue to find that the *Precision* × *Pre-Decision Effort* interaction is significant (p = 0.04). Thus, our conclusions for non-promoted employees remain the same.

to the promote/hire decision tend to continue to put forth high effort after promotion. We interpret this finding as promoted employees fulfilling their commitment to the strong effort signal they sent to their managers prior to their promotion. However, under an imprecise system, *Post-Decision Effort* is not significantly different across high and low *Effort Trend* (t = -1.08; p = 0.30, untabulated). We interpret this finding as promoted employees choosing instead to "hide" behind the imprecision of the system. That is, they feel less obligated to reciprocate their managers' promotion decision because their effort does not provide a clear signal of reciprocity to their managers in the presence of noise.[16]

We next turn to the post-experimental questionnaire to supplement the above findings. We use three questions that ask employees the rationale for their effort choices after the promote/hire decision. These three questions are: 1) "I wanted my supervisor to know that I chose high effort levels", 2) "I wanted my effort levels to be high enough to offset any possible negative random noise factor", and 3) "I wanted my supervisor to receive some compensation from my effort levels".[17] We label this factor *Reciprocate* and use it as the dependent variable to run two OLS regressions. Specifically, based on our earlier findings, we run a regression for non-promoted employees with *Precision* and *Post-Decision Effort* as the independent variables, and a regression for promoted employees with *Precision* and *Effort Trend* as the independent variables.

For non-promoted employees, we find that the *Precision* × *Post-Decision Effort* is directionally consistent with our results presented earlier, but the interaction is not significant at conventional levels (t = -1.49; p = 0.15, untabulated). For promoted employees, we find that the

[16] It is interesting to note that for employees the effort trend is predictive of post-promotion effort with a precise performance measurement system; yet managers appear to discount effort trends and instead focus on first period effort when making the promote/hire decision.

[17] Employees responded on a 7-point Likert Scale with 1 = "Not at all", 4 = "Moderately" and 7 = "Very much". All three questions load on a single factor with loading scores greater than 0.45. The single factor has an eigenvalue of 2.40 and explains 80 percent of variance across questions.

Precision × *Effort Trend* interaction is significant (t = 3.08; $p < 0.01$, untabulated). Under a precise system, the desire to reciprocate is significantly higher with a strong upward effort trend versus a downward effort trend (t = 2.55; $p = 0.02$, untabulated). In contrast, under an imprecise system, the desire to reciprocate is marginally lower with a strong upward effort trend versus a downward effort trend (t = 1.75; $p = 0.09$, untabulated).

Overall, these results support our intuition that promoted employees under a precise system feel a stronger need to reciprocate when they send their managers stronger signals about their effort intentions by increasing their effort sharply before the promote/hire decision. However, promoted employees under an imprecise system choose instead to "hide" behind the imprecision and noise after increasing their effort sharply before the promote/hire decision. Interestingly, such employees feel marginally more compelled to reciprocate with high effort after being promoted if they reduced versus increased their effort prior to the promote/hire decision, perhaps because they view managers' decision to still promote them as a sign of trust.

VI. CONCLUSION

In this paper, we examine the behavior of employees and managers before and after a promote/hire decision. Using behavioral economics theory, we hypothesize that this behavior will be characterized by trust and reciprocity. Consistent with our predictions, we find that employees incur costly effort before the promote/hire decision because they expect managers to reciprocate their effort by promoting them, even if a higher-ability outside candidate is available. We also find that employees' willingness to incur costly effort increases as the promote/hire decision is more imminent, suggesting that they anticipate their managers will place greater weight on their more recent effort levels. However, our results show that employees' anticipation of their managers' decisions is only partly correct. While employees who put in higher effort are

indeed more likely to be promoted, managers seem to anchor their promotion decision on employees' initial effort rather than on the sharp increase in their effort in the period immediately preceding the promote/hire decision.

Importantly, we predict and find that the design of the performance measurement system can influence managers' promote/hire decisions and employees' response to the decision outcome. Specifically, we find that managers are more likely to promote employees who provide relatively low effort levels under a less precise system because managers tend to give them the "benefit of the doubt". Further, our results suggest that employees' post-promotion decision effort is also contingent on the precision of the performance measurement system. Employees whose effort levels are trending upward in advance of the promote/hire decision continue providing relatively high effort after the promotion only if the system is precise. In contrast, when the system is imprecise, positive effort trends do not continue in the post-promotion period, suggesting that in such settings employees may feel less obliged to continue the gift exchange. In a similar vein, we find that employees who are passed over for a promotion respond more negatively with lower effort when the performance measurement system is more precise.

Our study is subject to a number of limitations. First, we test our hypotheses using a stylized economic experiment. Future research is needed to establish that our conclusions generalize to settings in which incentives are more complex and the tradeoffs are surrounded by more uncertainty. Two specific design features of our experiment that are noteworthy in this respect are that we assign (rather than observe) ability levels, and that we use a chosen effort task instead of a real effort task. We made these design choices to create the controlled conditions that allow a clean test of our hypotheses. Future research could examine if the results are different in settings in which employees exert real effort and ability differences reflect acquired

skills or talent. In addition, we model a setting in which one manager chooses between two candidates, one internal candidate and one external candidate. In most real-world settings, there will be multiple internal and external candidates competing for a vacancy, and the promote/hire decision will not be made by one manager but by a recruitment committee, or if the decision does fall on one individual, it will typically be made after receiving advice and recommendations from others. Future research can examine how promote/hire decisions made by groups may differ from those by individuals.

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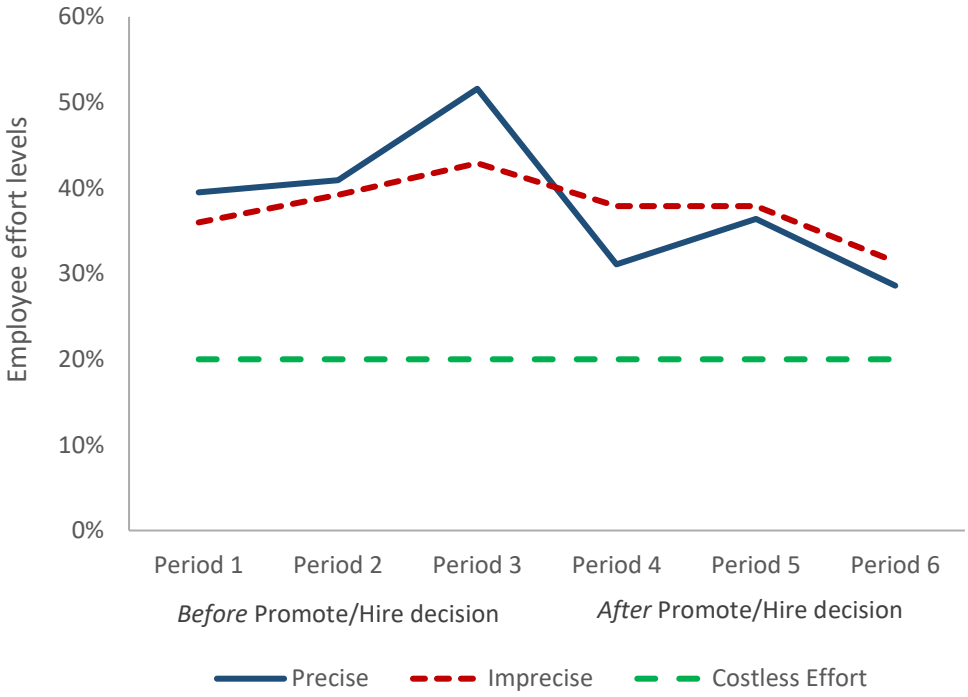
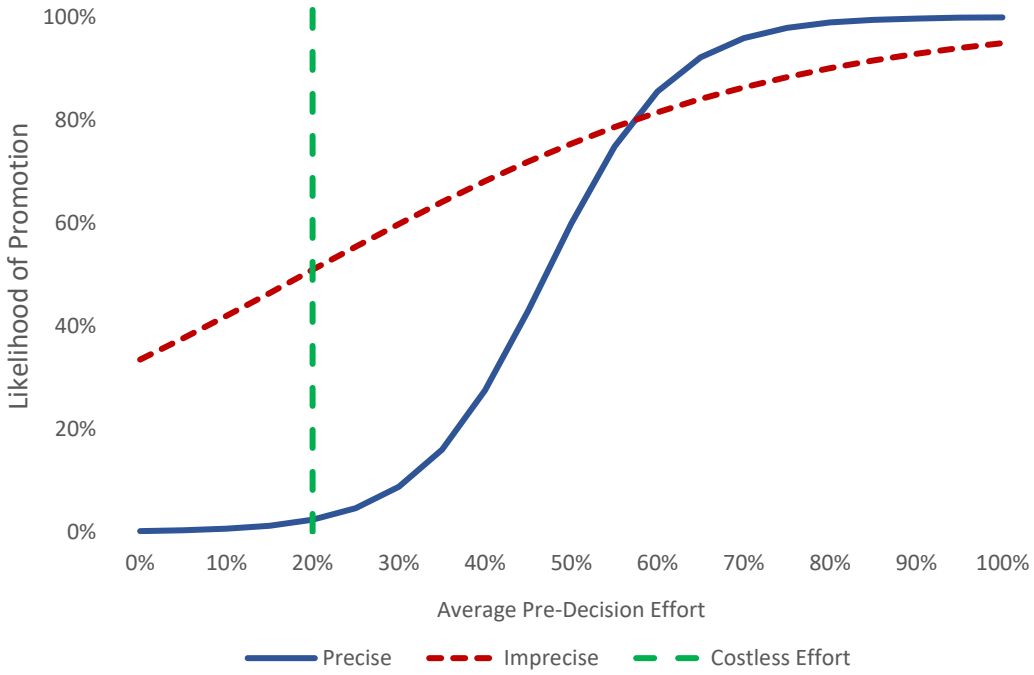
Figure 1
Employee Effort across Work Periods and across Performance Measurement System Precision



This figure provides the average level of effort chosen by employees across work periods and across conditions. Employees chose a level of effort with a corresponding cost of effort as shown in Panel A of Table 1. At the end of Period 3, the manager makes the promote/hire decision. In the *Precise (Imprecise)* condition, managers view employees' effort and a random noise factor separately (jointly).

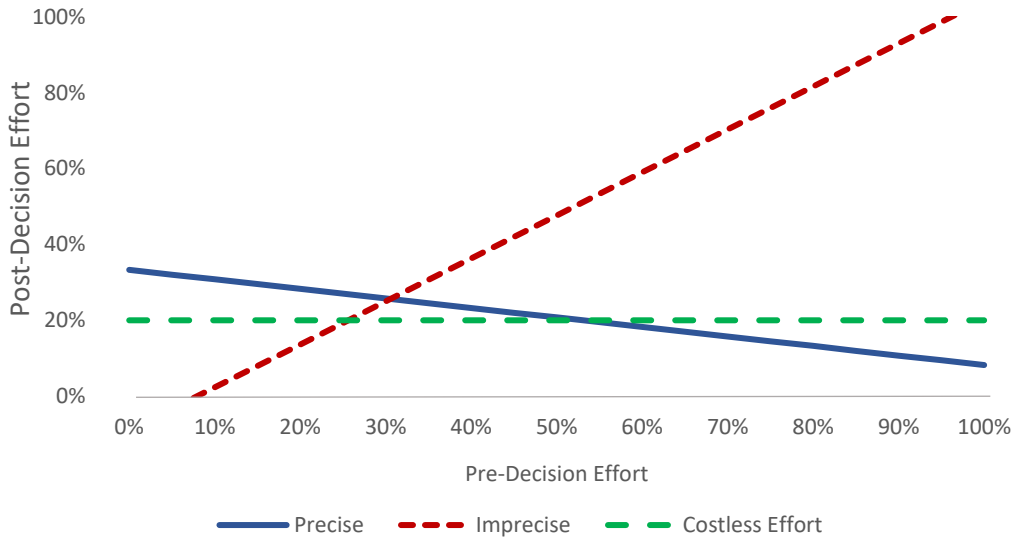
Figure 2
Likelihood of Promotion based on Pre-Decision Effort and Performance Measurement System Precision



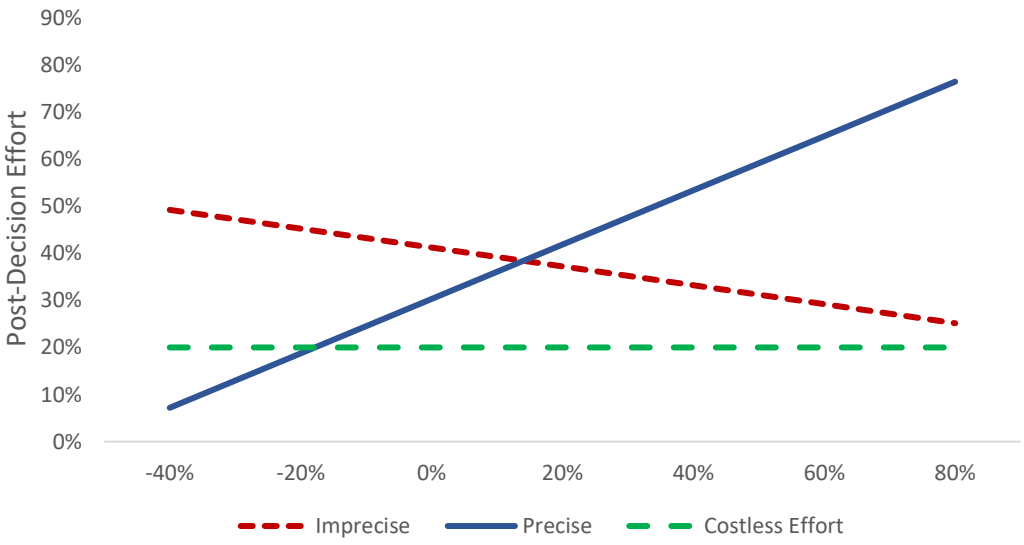
This figure provides the likelihood of promotion as a function of average effort levels prior to the promotion the decision across conditions. Pre-decision effort is the average effort levels across the first three work periods. In the *Precise (Imprecise)* condition, managers view employees' effort and a random noise factor separately (jointly).

Figure 3

Panel A: *Post-Decision Effort* as a function of *Precision* and *Pre-Decision Effort* for Non-Promoted Employees



Panel B: *Post-Decision Effort* as a function of *Precision* and *Pre-Decision Effort Trend* for Promoted Employees



The figure in Panel A provides detail on effort levels of non-promoted employees following the promotion decision. For this graph, *Post-Decision Effort* is on the y-axis and *Pre-Decision Effort* is on the x-axis. The figure in Panel B provides detail on effort levels of promoted employees following the promotion decision. For this graph, *Post-Decision Effort* is on the y-axis and *Effort Trend* is on the x-axis.

Table 1: Effort-Cost Tables

Panel A: Employee Effort-Cost Table

Effort Level	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Cost of Effort	0	0	0	0	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80

Panel B: External Candidate Effort-Cost Table

Effort Level	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Cost of Effort	0	0	0	0	0	0	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70

Panel A shows employees' cost of effort table and Panel B shows external candidates' cost of effort table. Each effort level has an associated cost of effort that reduces the employee's compensation. External Candidates have a higher costless effort level (i.e., 30%) compared to Employees (i.e., 20%).

Table 2: Variable Descriptions

Variable	Description
Period 1 Effort	Employees' effort in period 1
Period 2 Effort	Employees' effort in period 2
Period 3 Effort	Employees' effort in period 3
Pre-Decision Effort	Average of period 1 through 3 employee effort
Post-Decision Effort	Average of period 4 through 6 employee effort
Precision	Coded 1 (0) for *Precise* (*Imprecise*) Condition
Period	Indicator variable for each period
Promotion Signal	Average on post-experiment question about effort prior to the promotion decision: 1) I wanted to increase my chances of being promoted by my supervisor 2) I wanted my supervisor to know that I chose high effort levels
Effort Trend	Period 3 effort – period 1 effort
Promote	Coded 1 (0) if the manager promotes the internal employee (hires the external candidate) to the higher-level job
Gender	Coded 1 (0) if the manager is male (female)
Reciprocate	PCA on post-experiment questions about effort after the promotion decision: 1) I wanted my supervisor to know that I chose high effort levels 2) I wanted my effort levels to be high enough to offset any possible negative random noise factor 3) I wanted my supervisor to receive some compensation from my effort levels.

Table 3: Summary Statistics

Panel A: Average (Std. Dev.) [Obs.] Employee Effort across Work Periods and Conditions

	Period 1	Period 2	Period 3	Pre-Decision Effort	Period 4	Period 5	Period 6	Post-decision Effort
	39.5%	40.9%	51.6%	44.0%	31.1%	36.4%	28.6%	32.0%
Precise	(22.5)	(20.4)	(27.2)	(19.2)	(26.6)	(27.7)	(17.5)	(21.5)
	[22]	[22]	[22]	[22]	[22]	[22]	[22]	[22]
	36.0%	39.2%	42.9%	39.4%	37.9%	37.9%	31.5%	35.8%
Imprecise	(19.5)	(15.9)	(20.4)	(14.5)	(21.4)	(23.5)	(21.2)	(18.3)
	[24]	[24]	[24]	[24]	[24]	[24]	[24]	[24]
	37.7%	40.0%	47.1%	41.6%	34.7%	37.2%	30.1%	34.0%
Combined	(20.8)	(18.0)	(24.0)	(16.9)	(24.0)	(25.3)	(19.4)	(19.8)
	[46]	[46]	[46]	[46]	[46]	[46]	[46]	[46]

Panel B: Frequency of Promote/Hire Decisions across Conditions

	Promote	Hire External
Precise	9	13
Imprecise	16	8
Combined	25	21

Panel C: Average (Std. Dev.) Employee Effort across Promote/Hire Decisions and Conditions

	Pre-Decision Effort		*Post-Decision Effort*	
	Non-Promoted Employees	**Promoted Employees**	**Non-Promoted Employees**	**Promoted Employees**
	33.6%	59.1%	24.9%	42.4%
Precise	(10.3)	(19.4)	(15.0)	(25.8)
	[13]	[9]	[13]	[9]
	34.8%	41.7%	30.4%	38.4%
Imprecise	(14.3)	(14.4)	(22.5)	(16.0)
	[8]	[16]	[8]	[16]
	34.0%	47.9%	27.0%	39.9%
Combined	(11.7)	(18.1)	(17.9)	(19.6)
	[21]	[25]	[21]	[25]

This table provides descriptive data. Panel A provides the employee effort across periods and conditions. Panel B provides the count of promotions versus external hires across conditions. Panel C provides average pre-decision effort and average post-decision effort across conditions and promotions versus external hires. Table 2 provides a list of all variables.

Table 4: Test of H1a and H1b

Panel A: Two-tailed t-Tests of Employees' Pre-Decision Effort Levels and the Costless Effort Level

	Period 1	**Period 2**	**Period 3**	**Ave. of Periods 1-3**
Precise	39.5% vs. 20% n = 22 t = 4.08 $p < 0.01$	40.9% vs. 20% n = 22 t = 4.81 $p < 0.01$	51.6% vs. 20% n = 22 t = 5.45 $p < 0.01$	44.0% vs. 20% n = 22 t = 5.86 $p < 0.01$
Imprecise	36.0% vs. 20% n = 24 t = 4.02 $p < 0.01$	39.2% vs. 20% n = 24 t = 5.90 $p < 0.01$	42.9% vs. 20% n = 24 t = 5.51 $p < 0.01$	39.4% vs. 20% n = 24 t = 6.56 $p < 0.01$

Panel B: Average (Std. Dev.) Costly Effort for Employees in Stage 1 and Candidates in Stage 2

	Employees (Stage 1)	**Candidates (Stage 2)**	**Significance**
Both Conditions	21.6% (16.9%)	12.9% (14.8%)	t = 2.59 $p = 0.01$
Precise	24.0% (19.2%)	12.3% (16.4%)	t = 2.00 $p = 0.06$
Imprecise	19.4% (14.5%)	13.4% (13.4%)	t = 1.65 $p = 0.11$

Panel C: Repeated Measures ANOVA Examining Employee Effort as a function of work period and condition

Source	df	MS	**F-Stat**	**p-value**
Precision	1	29.6	0.87	$p = 0.35$
Period	2	44.9	4.64	$p = 0.01$
Precision × *Period*	2	6.0	0.62	$p = 0.54$
Residual	88	9.7		

This table provides the test of H1a and H1b. Panel A provides the results of two-tailed t-tests comparing average employee effort across conditions compared to employees' costless effort level. Panel B provides two-tailed t-test of employees' *costly* effort pre-promote/hire decision compared to the external candidates' costly effort after joining the firm. We calculate costly effort as effort level – maximum costless effort level (see Table 1). Panel C provides the result of a repeated-measures ANOVA with period 1-3 data. Table 2 provides a list of all variables.

Table 5: Logistic Regression Examining Promotion Determinants (H2a and H2b)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Pre-Decision Effort	0.06***	0.08***	0.08***	0.07**	-	-
	(2.63)	(2.83)	(2.70)	(2.26)		
Precision	-	-1.63**	-1.57**	-1.45*	-	-1.59**
		(-2.19)	(-1.97)	(-1.73)		(-2.04)
Pre-Decision Effort × *Precision*	-	-	0.10	0.14**	-	-
			(1.58)	(1.94)		
Gender	-	-	-	-1.62*	-	-1.19
				(-1.78)		(-1.50)
Period 1 Effort	-	-	-	-	0.04*	0.04*
					(1.64)	(1.67)
Period 2 Effort	-	-	-	-	0.01	-0.00
					(0.37)	(-0.01)
Period 3 Effort	-	-	-	-	0.02	0.12
					(0.97)	(1.14)
Observations	46	46	46	46	46	46
LR Chi^2	9.09	14.50	17.48	20.96	9.77	17.54
Pseudo R^2	0.14	0.23	0.28	0.33	0.15	0.28

Coefficients (Z-scores) provided. *, **, *** indicates two-tailed statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table provides the test of H2a and H2b. The dependent variable is coded 1 (0) if the manager promotes the employee (hires the external candidate) to the higher-level job. Table 2 provides a list of all variables. *Pre-Decision Effort* and *Precision* are mean-centered.

Table 6: Effort Levels after the Promote/Hire Decision

Panel A: Effort Levels of Promoted and Non-Promoted Employees

	Promoted Employees	Non-promoted Employees	Significance
Pre-Decision Effort	47.9%	34.0%	t = 3.02
	(18.1)	(11.7)	$p < 0.01$
Post-Decision Effort	39.9%	27.0%	t = 2.31
	(19.6)	(17.9)	$p = 0.03$
Effort Change	-8.0%	-7.0%	t = 0.16
	(24.7)	(17.9)	$p = 0.88$

Panel B: OLS Regression Examining Effort Levels after the Promote/Hire Decision

	Promoted Employees	Non-Promoted Employees
Precision	2.84	-15.26*
	(0.26)	(1.80)
Pre-Decision Effort	0.14	0.47
	(0.55)	(1.54)
Precision × *Pre-Decision Effort*	-0.15	-1.38**
	(-0.29)	(-2.26)
Observations	25	21
Adjusted R^2	-0.11	0.21

Panel C: OLS Regression Examining Effort Levels after the Promote/Hire Decision

	Promoted Employees	Non-Promoted Employees
Precision	-2.57	-16.06*
	(-0.25)	(-1.80)
Effort Trend	0.17	0.28
	(1.05)	(0.99)
Precision × *Effort Trend*	0.78**	-0.01
	(2.36)	(-0.01)
Pre-Decision Effort	0.20	0.34
	(0.81)	(0.97)
Precision × *Pre-Decision Effort*	-0.17	-1.59**
	(-0.35)	(-2.29)
Observations	25	21
Adjusted R^2	0.05	0.16

Coefficients (t-scores) provided. *, **, *** indicates two-tailed statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table provides the test of our research question. In panels B and C, the dependent variable is *Post-Decision Effort*. Table 2 provides a list of all variables. *Pre-Decision Effort*, *Effort Trend*, and *Precision* are mean-centered.