

**Social Comparison and Impression Management:
The Joint Effect of RPI and Supervisor Presence
On Employee Performance**

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University of Pittsburgh, 2023

My dissertation consists of three chapters. In Chapter 1.0, I first establish the structure of my dissertation. I then provide a brief introduction to the relative performance information literature (RPI) and its importance to both practice and research. I specifically describe how my dissertation answers a call for research regarding the effect of providing employees with RPI in the presence of a supervisor.

In Chapter 2.0, I provide a focused review of the academic literature regarding RPI. I first describe what RPI is and then describe the predictions that the traditional economic literature and behavioral literature would make regarding how providing RPI to employees should affect employee performance. I then describe previous studies that have analyzed RPI's effect on employee performance under both tournament and non-tournament contracts and other moderating variables. Many of these studies analyze settings where either a supervisor is not present or the role of a supervisor is deemphasized. I identify this as an important research area and outline how my dissertation contributes to the RPI literature.

In Chapter 3.0, I provide evidence that the traditional positive effect on employee performance of providing employees with RPI is decreased when a supervisor is present. Using an experiment, I manipulate whether employees receive RPI and whether a supervisor is present in the experimental setting. I first replicate previous research by providing evidence of a positive effect of RPI on employee performance when no supervisor is present. Second, I provide evidence

that when employees do not receive RPI, the presence of a supervisor increases employee performance. Third, I fail to find an effect of RPI on employee performance when a supervisor is present. Thus, I provide evidence that providing RPI to employees may not effectively motivate employees to increase their performance when the presence of a supervisor is salient.

Table of Contents

Preface.....	x
1.0 Introduction.....	1
2.0 Literature Review	4
2.1 Theoretical Underpinnings	5
2.1.1 Economic Agency Perspective.....	5
2.1.2 Behavioral Perspective.....	6
2.2 RPI’s Effect on Employee Performance When Compensation is Not Tied to Relative Performance	8
2.3 My Setting of Interest.....	10
2.4 RPI’s Effect on Employee Performance When Compensation is Tied to Relative Performance	15
3.0 Experimental Study	18
3.1 Introduction	18
3.2 Hypothesis Development.....	21
3.2.1 Relative Performance Information and Social Comparison.....	21
3.2.2 Presence of a Supervisor and Impression Management.....	22
3.2.3 Joint Effect of RPI and the Presence of a Supervisor	24
3.2.4 Joint Effect of RPI and the Presence of a Supervisor who Awards a Bonus.....	25
3.3 Method.....	27
3.3.1 Participants.....	27
3.3.2 Overview of Experimental Design	28

3.3.3 Procedures	29
3.3.3.1 <i>NoSup</i> Conditions	33
3.3.3.2 <i>Sup</i> Conditions	34
3.3.3.3 <i>SupBonus</i> Conditions.....	35
3.3.4 Post-Experimental Questionnaire.....	36
3.4 Results.....	37
3.4.1 Test of Hypothesis 1	41
3.4.2 Test of Hypothesis 2	44
3.4.3 Tests of Hypothesis 3.....	48
3.4.4 Supplementary Analysis	50
3.4.5 Research Question – Supervisor Awards a Bonus	54
3.5 Discussion	59
References	63

List of Tables

Table 1 Summary of Most Relevant RPI Studies	12
Table 2 Primary Dependent Variable - Employee Performance (Number of Sliders Completed).....	38
Table 3 Employee Social Comparison Engagement	43
Table 4 Employee Impression Management Engagement	46
Table 5 Employee Performance - <i>NoSup</i> vs. <i>SupBonus</i>	56

List of Figures

Figure 1 Experimental Design	29
Figure 2 Experiment Timeline.....	31
Figure 3 Effect of RPI and the Presence of a Supervisor on Employee Performance.....	40
Figure 4 Moderated-Mediation of Social Comparison Engagement	52
Figure 5 Effect of RPI and the Presence of a Supervisor who Awards a Bonus on Employee Performance	57

Preface

I thank my dissertation co-chairs, Don Moser and Patrick Martin, and dissertation committee members, Harry Evans, Vicky Hoffman, Drew Newman, and Eric Chan. Don once told me about how he had to give a presentation to PhD students on how to form a dissertation committee. He wanted to tell them to form a committee like mine because I had a phenomenal committee. I couldn't agree more! I thank my committee for their time and effort in not only seeing me through the dissertation process but also helping me create a foundation for a successful career.

Don Moser has been the most perfect advisor a PhD student could ask for. He has helped me from the first day of my doctoral program. He made sure I always thoroughly thought through an argument and then helped me express my ideas clearly. I always felt that my success was one of Don's top priorities and he would make sure to give me the support I needed to succeed. For example, Don allowed me to design an experimental managerial accounting seminar, where I decided on what papers to read and then we would discuss the papers. This seminar was crucial in the development of both my first-year paper and my dissertation. Don also took interest in me as an individual. Because I love sports, we usually started our conversations by going over the most recent Pitt sporting news. He even took me to my first Pirates game. The thing I appreciate most about Don is how mindful he was of my family. He was frequently asking for updates on how my family was doing and would remind me to make sure to make time for them.

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challenges collecting my data for this dissertation. He also was willing to meet with me weekly to go over my progress and talk through any questions I had. I will look to the example Patrick set of how to be a good colleague.

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Vicky Hoffman was the first person I talked to from Pitt and was a large reason why I came to Pitt. She helped me see how Pitt would both challenge me and enable me to become a better scholar. I admire her passion for wanting Pitt students to succeed. Vicky is a true ambassador for Pitt. There is no one that I would rather have in my corner to advocate for me.

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1.0 Introduction

My dissertation consists of three chapters. Chapter 1.0 introduces my research topic and provides a brief overview of Chapters 2.0 and 3.0. Chapter 2.0 provides a review of the relevant literature and Chapter 3.0 presents my original research study.

While previous studies have addressed how relative performance information (hereafter RPI) affects employee performance, these studies often analyze settings that either downplay or do not include the role of a supervisor. My research extends previous research by analyzing how the presence of a supervisor alters the relation between providing employees with RPI and their performance.

RPI refers to information regarding an employee's performance relative to some comparable benchmark, e.g., how an employee performed relative to their coworkers. While employees can receive RPI by informally observing their peers (Mas and Moretti 2009), explicitly providing employees with RPI is becoming more common in practice and has been used in a wide variety of settings, including warehouses (Blanes i Vidal and Nossol 2012), banks (Gino and Staats 2011), and even professional soccer leagues (Eyring et al. 2021).

As providing employees with RPI has become more prevalent in practice, considerable research has focused on how providing employees with RPI affects their performance (Blanes i Vidal and Nossol 2012; Tafkov 2013; Newman and Tafkov 2014; Azmat and Iriberry 2016; Eyring and Narayanan 2018; Eyring et al. 2021). In such studies, researchers typically consider settings in which employee compensation is not tied to relative performance and examine the effect of RPI by comparing employee performance when employees are provided with RPI versus when they are not. These studies typically find higher performance when employees are provided with RPI

compared to when they are not. Such results have been interpreted as evidence that providing employees with RPI increases employee performance.

However, these studies that find a positive effect of RPI on employee performance do not consider a significant factor in many real-world settings: the presence of a supervisor. Interestingly, there are two studies, Chan (2018) and Fisher et al. (2002), that use experimental settings in which a supervisor plays a significant role, and both studies fail to find a positive effect of RPI on employee performance. My dissertation directly addresses Chan's call to further study whether the presence of a supervisor can explain why he finds no evidence of a positive effect of providing RPI on employee performance.

Chapter 2.0, Section 2.1 presents the theoretical underpinnings, both economic and behavioral, for how providing RPI to employees can affect their performance. Section 2.2 reviews the prior literature regarding RPI's effect on employee performance. Because my study focuses on a setting in which employees' compensation is not tied to their relative performance, I review prior research that examines the effect of RPI on employee performance in such settings. Section 2.3 describes the contribution of my study and discusses how my findings fit into the existing RPI literature. Finally, for completeness, Section 2.4 reviews prior research that examines the effects of RPI in settings in which employees are compensated based on their relative performance.

In Chapter 3, I address my main research question by examining the effect of RPI on employee performance in the presence of a supervisor. Using a between-participants experiment, I first replicate the prior research by providing evidence that, when no supervisor is present, performance is higher when employees are provided with RPI than when they are not. Next, I show that, when RPI is not provided, employee performance is higher when a supervisor is present than when no supervisor is present. Finally, consistent with my predictions, I provide evidence that the

replicated effect of RPI on employee performance is eliminated when a supervisor is present. As such, my study provides a potential explanation for why Chan (2018) and Fisher (2002) failed to find an effect of RPI on employee performance in their studies. In addition, as discussed in Chapter 3, my findings have potential implications for how RPI is implemented in practice and for future RPI research.

2.0 Literature Review

I begin Chapter 2.0 by briefly describing RPI. Next, I discuss the theoretical underpinnings for RPI's effect on employee performance from both an economic and behavioral perspective. I then review the prior literature regarding the effect on employee performance of providing employees with RPI in settings in which employee compensation is not tied to their relative performance. I then discuss how my study relates to and extends the existing RPI literature. Because my research question examines the effects of RPI on employee performance, I focus on this relation in Chapter 2.0. Schnieder (2022) provides a more extensive review of the RPI literature that includes the effect of RPI on additional variables other than employee performance. Finally, for completeness, I review the RPI literature in settings in which employee compensation is tied to their relative performance in the final section of Chapter 2.

RPI refers to information regarding an employee's performance relative to some comparable benchmark, e.g., how an employee performed relative to their coworkers. RPI comes in many forms, for example, the performance percentile of an employee or how an employee ranks (i.e., first, second, third, etc.) in a group. The precision of the RPI given to employees can also vary; it can be very imprecise, such as whether an employee performed above or below average, or very precise, such as an employee whose performance was in the 83rd percentile of all employees.

While employees can receive RPI by informally observing their peers (Mas and Moretti 2009), it is becoming increasingly common for firms to explicitly provide employees with RPI. RPI has been studied in a wide variety of settings, including warehouses (Blanes i Vidal and Nossol 2012), banks (Gino and Staats 2011), and even professional soccer leagues (Eyring et al. 2021).

RPI is now also provided in the form of leaderboards when firms implement gamification techniques, which are growing in popularity (Reeves and Read 2013; Wingfield 2012).

2.1 Theoretical Underpinnings

2.1.1 Economic Agency Perspective

The use of RPI in business has its roots in classical agency theory. Specifically, Holmstrom (1979) proves the informativeness principle—that as long as a signal provides incremental information either about an agent’s effort or a random state, regardless of how noisy the signal may be, it can provide benefits when contracting with agents. Holmstrom (1982) extends this to a multi-agent setting such that a principal who oversees multiple agents can design a contract to reward or punish a single agent based on how the agent performed relative to the average agent to remove the effect of common risks faced by all the agents. By designing the contract in this manner, some of the risks faced by the agent are removed, which leads to a more efficient contract and increases the agent’s effort.

One implication of Holmstrom’s (1982) model is that as the common risk between the agents increases, the value of RPI to the principal will increase as well. Frederickson (1992) tests this implication and finds that in the presence of RPI, agents exert more effort as the level of risk increases. These early studies show that the initial accounting research regarding RPI was focused on allowing a principal to better infer an agent’s unobservable effort (Frederickson 1992).

More recent research shifted the focus from how principals use RPI to how providing RPI to employees affects employee behavior, specifically employee performance. From an economic

perspective, providing employees with RPI should only have an impact on employee performance when the employees' compensation is tied to their relative performance.¹ When employees' compensation is tied to their relative performance, providing RPI to employees allows them to estimate the probability of receiving a certain amount of compensation. This allows employees to adjust the amount of effort they provide based on their expected compensation (He 2021; Hannan et al. 2008; Newman and Tafkov 2014). This is discussed further in Section 2.4.

However, for purposes of my study, it is important to understand that in settings in which employees' compensation is not tied to their relative performance, traditional economic theory predicts that providing RPI to employees has no impact on employee performance (Frederickson 1992; Hannan et al. 2008). In such settings, RPI no longer allows employees to estimate their expected compensation, and as such, according to traditional economic theory, does not motivate them to adjust the amount of effort they provide.

2.1.2 Behavioral Perspective

Despite the traditional economic agency perspective that providing RPI to employees does not affect employee performance when employees' compensation is not tied to their relative performance, a number of studies find that RPI does increase employee performance in such settings (Hannan et al. 2008; Kerr et al. 2007; Tafkov 2013). These studies rely on social comparison theory to predict that providing employees with RPI affects their performance. Festinger's (1954) theory of social comparison assumes that the effects of social comparison result

¹ The term relative performance evaluation (RPE) is often used to identify a setting where employees' compensation depends upon their relative performance, such as a tournament contract. Conversely, RPI refers only to information regarding employees' relative performance. To avoid confusion, I avoid using the term RPE throughout my dissertation.

from an innate drive for humans to evaluate their abilities. This evaluation can be made based on objective measures. However, Festinger (1954) argues that humans will use others' abilities as a benchmark to evaluate their own abilities when objective measures are not available. Providing employees with RPI provides such a benchmark, which allows employees to evaluate how they are performing relative to their peers (Suls and Wheeler 2000; Brown et al. 2007).

However, providing employees with RPI does more than simply allow them to know how their abilities compare to others. Additionally, this provides employees with a means to try to increase their self-image based on their relative performance (Smith 2000). Providing RPI to employees motivates them to compete to outperform other employees to boost their self-image (Brown et al. 2007; Garcia and Tor 2007). That is, competition with other employees motivates them to provide more effort, which leads to an increase in performance even when their compensation is not tied to their relative performance.

Tafkov (2013) outlines three factors that can lead to greater social comparison and thus increased competition and performance. First, the task performed by employees must be similar across employees (Harkins and Jackson 1985; Garcia and Tor 2007). This allows employees to make a comparison. Second, the employees must have similar characteristics that predict performance on the task (Goethals and Darley 1977; Garcia and Tor 2007). This allows employees to attribute any differences in performance to differences in ability as opposed to other factors. Third, the employees must care about the ability that is being compared (Pleban and Tesser 1981; Tesser 1991). The more important the ability, the greater the motivation to outperform the other employees.

2.2 RPI's Effect on Employee Performance When Compensation is Not Tied to Relative Performance

In this section, I review RPI studies using settings in which employees' compensation is not tied to their relative performance. In such settings, any effect of RPI on employees' effort cannot be due to their motivation for increased wealth because their wealth is not affected by their relative performance.² I focus on reviewing such studies because this is the setting I examine in my study. For completeness, I also review RPI's effects in settings in which employees' compensation is tied to relative performance in the final section in this chapter.

Common settings in which RPI has been studied in which employees' compensation is not tied to their relative performance include settings in which employees are paid a fixed-wage (Kerr et al. 2007; Tafkov 2013), are paid based on their individual performance (Hannan et al. 2008; Tafkov 2013; Blanes I Vidal and Nossol 2011), or receive no financial benefits (Eyring and Narayanan 2018; Azmat and Iriberry 2010). Because employees' compensation is not tied to their relative performance, these studies rely on social comparison theory to predict that providing employees with RPI will increase their performance. Consistent with social comparison theory, these studies typically find a positive effect of RPI on employee performance.

Prior research has also studied factors that alter the effect of RPI on employee performance. One such factor is the amount of information given to the employees. For example, Tafkov (2013) finds that RPI has a greater effect when it is public (i.e., each employee knows every other

² Schnieder (2022) focuses on the effects of RPI in settings in which compensation is not tied to relative performance.. While my study also focuses on a setting in which compensation is not tied to relative performance, for completeness in understanding RPI's effect on employee performance, I also briefly review the literature that examines the effects of providing RPI when employee compensation is tied to their relative performance.

employee's RPI rank) as compared to when it is private (i.e., employees only know their personal RPI rank). Additionally, Eyring et al. (2021) find that among professional soccer players doing practice drills, providing RPI based on a player's rank increases performance more than providing only absolute performance information (e.g., their passing accuracy) or providing both RPI and absolute performance information. Eyring et al. (2021) also manipulate whether players receive aggregate performance information (i.e., average pass accuracy for all passes) or detailed performance information (i.e., average pass accuracy for specific types of passes), though they find no effect on performance of providing more detailed information.

Another factor that affects RPI's relation with employee performance is the reference point used when RPI is given in the form of employee performance relative to a benchmark. Eyring and Narayanan (2018) find that students in an online course performed better when they were given a reference point best suited for their actual performance (e.g., high performers were told how they performed relative to the top quartile). Hannan et al. (2008) find that in when employees are not compensated based on relative performance, the precision of the RPI provided did not have an effect on employee performance.

Holderness et al. (2020) analyze how the frequency with which RPI is provided to employees interacts with whether the employee is assigned to view RPI or chooses to view RPI. They find that when RPI is assigned, employee performance initially increases as the frequency of RPI goes up, but performance decreases once the frequency reaches a certain threshold. However, when employees choose how often to view RPI, the decrease in performance due to too frequent RPI reverses because employees placed greater weight on the RPI as a result of choosing to view it.

While these studies generally find a positive effect of RPI on employee performance in settings in which employees' compensation does not depend on relative performance, there are some studies that find either no effect or a negative effect of RPI on employee performance in such settings. As indicated above, providing RPI to employees too frequently when it is not chosen by the employees can harm performance (Holderness et al. 2020). Additionally, Schedlinsky et al. (2020) provide evidence that the effect of RPI on performance decreases when employees are under video surveillance because employees in such a setting perceive the provision of RPI to be a control mechanism. Finally, Chan (2018) and Fisher (2002) fail to find an effect of RPI on employee performance in a setting where a supervisor chooses an employee from a group to receive a promotion.

2.3 My Setting of Interest

In Table 1, I summarize the studies that are most relevant to my study. Most of the studies in Table 1 use experiments to examine how employees respond when they are provided with RPI versus when they are not. These experiments are designed to isolate specific effects, and thus, by design, they necessarily control for, or abstract away from, many other aspects of actual employment settings. Specifically, the goal of many of these prior RPI experiments was to isolate the effect of social comparison on employee performance that is prompted when employees are provided with RPI (Tafkov 2013, Hannan et al. 2008., Newman and Tafkov 2014). To isolate the effects of social comparison from other potential effects, these researchers intentionally and appropriately excluded a prominent feature of actual employment settings, i.e., the presence of the

employees' supervisor, from their experimental settings (studies 1- 5 in Table 1).³ However, when a supervisor is present, employees will likely try to perform well to impress their supervisor. This raises the question of whether an increase in performance resulting from employees' desire to impress their supervisor substitutes for the social comparison effect (i.e., whether there is no difference in performance when both RPI and a supervisor are present than when only RPI is present) or complements the increase in performance resulting from social comparison (i.e., performance is higher when both RPI and a supervisor are present than when only one of those factors is present).

While much of the research on how RPI affects employee performance uses laboratory experiments in settings without a supervisor, there are a few studies that use settings in which supervisors are present (studies 7-11). These studies find mixed results regarding the effect of RPI on employee performance. Specifically, Azmat and Iriberry (2010), Blanes i Vidal and Nossol (2011), and Eyring et al. (2021) (studies 7-9) are field studies that find a positive effect of RPI on performance with a supervisor present, while Fisher et al. (2002) and Chan (2018) (studies 10-11) are experimental studies with a supervisor present that find no difference in performance when employees have RPI versus when they do not.

³ Study 6, Eyring and Narayanan (2018), also studies a setting without a supervisor present. However, it is a field study and thus was not specifically designed to examine the effect of the presence of a supervisor by manipulating the presence or absence of a supervisor.

Table 1 Summary of Most Relevant RPI Studies

Study Number	Authors	Year	Type of Study	Participants	Main Research Question	Effect of RPI on Performance	Supervisor Present	Economic Incentives tied to RPI
1	Tafkov	2013	Laboratory Experiment	Undergraduate Students	Differential effects of private and public RPI under different compensation contracts.	Positive	No	No
2	Hannan et al.	2019	Laboratory Experiment	University Students	Effects of RPI informativeness on employee effort allocation in multi-task environment	?	No	No
3	Holderness et al.	2020	Laboratory Experiment	Business Students	Effect of RPI on performance when RPI frequency is chosen versus assigned.	Positive	No	No
4	Hannan et al.	2008	Laboratory Experiment	Business Students	Effects of RPI and its precision under tournament and individual incentive schemes	Positive No Effect/Negative	No No	No Yes

Study Number	Authors	Year	Type of Study	Participants	Main Research Question	Effect of RPI on Performance	Supervisor Present	Economic Incentives tied to RPI
5	Newman and Tafkov	2014	Laboratory Experiment	University Students	Effects of RPI in tournaments with different prize structures	Mixed	No	Yes
6	Eyring and Narayanan	2018	Field Experiment	Online Course Students	Effects of providing a high reference point on performance.	Present	No	No
7	Azmat and Iriberry	2010	Field Study	High School Students	Effect of providing performance relative to the average on grades	Positive	Yes	No
8	Blanes i Vidal and Nossol	2011	Field Study	Warehouse Workers	Effect of announcement that RPI will be provided and actual provision of RPI on worker performance	Positive	Yes	No
9	Eyring et al.	2021	Field Experiment	Professional and Semi-professional soccer players	Effects of absolute, relative, or both absolute and relative performance information on performance.	Positive	Yes	No
10	Fisher et al.	2002	Laboratory Experiment	Undergraduate Students	Effects of using budgets to allocate resources and providing RPI on budget slack and performance	No Effect	Yes	Yes
11	Chan	2018	Laboratory Experiment	Undergraduate Students	Effect of providing employees RPI on employers' promotion decisions and the impact of those decisions on worker performance	No Effect	Yes	Yes

Chan suggests employees' desire to impress their supervisor in his No RPI condition may have increased their performance to a level equal to the level of performance induced by social comparison in the RPI condition. In his setting, the employees had a clear reason to try to impress their supervisor because the supervisor's main task was to choose one employee from a group of employees to receive a promotion. In contrast, the settings in the RPI field studies that include a supervisor (Blanes i Vidal and Nossol 2011; Azmat and Iriberry 2010; Eyring et al. 2021) vary considerably, and it is not always clear if employees have a compelling reason to impress their supervisor. For example, Blanes i Vidal and Nossol (2011), who find a positive effect of RPI on performance, explain that the likelihood of both termination and promotion of employees in their setting is "close to zero." This likely decreased employees' desire to impress their supervisor. This is in stark contrast to Chan's setting in which employees had an explicit incentive to try to impress their supervisor, and in which no difference in performance is found when employees have RPI versus when they do not.

My study, which is presented in Chapter 3.0, is designed to contribute to the accounting literature regarding RPI's effect on employee performance by providing a direct test of Chan's (2018) speculation that the presence of a supervisor can result in no incremental positive effect of providing RPI on employee performance. Additionally, I specifically design my experiment such that I can test not only how the mere presence of a supervisor affects the relation between RPI and performance, but also how employees' performance may be affected when they have explicit economic incentives to impress their supervisor.

2.4 RPI's Effect on Employee Performance When Compensation is Tied to Relative Performance

While the setting I use in my study is one in which compensation is not based on relative performance, for completeness I briefly review the effect of RPI on employee performance in studies in which employees' compensation is tied to their relative performance. Such contracts are commonly referred to as tournament contracts. The most common incentive structure in tournament contracts is one in which the top-performing employee(s) receive a bonus in addition to their base compensation, while the other employees receive only their base compensation. However, as will be discussed in more detail later, the exact structure of incentives in a tournament contract can vary. As discussed previously, the compensation structure of tying the employees' compensation to their relative performance was designed to help remove some of an employee's performance risk due to common factors shared by all employees (Holmstrom 1982)

In tournament settings, the effect of RPI on employee performance depends on how it affects the employees' expectations of winning the tournament. From an economic perspective, if RPI indicates to an employee that they have a high chance of winning the tournament (i.e., the employee has a high relative rank), the marginal benefit of effort increases and the employee should provide more effort which leads to higher performance. Conversely, if RPI indicates to an employee that they have a low chance of winning the tournament (i.e., the employee has a low relative rank), the marginal benefit of effort decreases and should lead to lower employee performance. Indeed, this is what has been generally found in the literature. Both Hannan et al. (2008) and Delfgaauw, Dur, Non, and Verbeke (2014) find either no overall effect or a negative overall effect of RPI on employee performance in the traditional tournament structure because

although high performers increase their performance when given RPI, the low performers either do not respond to or work inefficiently after receiving RPI.

Building on Hannan et al. (2008), Newman and Tafkov (2014) analyze RPI's effect on employee performance under different tournament structures. They rely on tournament theory models by Gilpatric (2009) and Moldovanu and Sela (2001) to predict that, absent RPI, employee performance will be greater in a tournament that rewards the highest performer(s) and punishes the lowest performer(s) (i.e., reward and punishment tournament) than a tournament that only rewards the highest performers(s) (i.e., reward tournament). Using this underlying theory, they conduct an experiment providing evidence that, as described previously, providing RPI to employees in a reward tournament negatively affects overall employee performance. However, they also predict and find that providing RPI to employees in a reward and punishment tournament leads to an increase in overall employee performance. This is because in a reward and punish tournament, RPI informs employees not only of their likelihood of winning the tournament and receiving the reward but also the likelihood of losing and receiving the punishment. Thus, while low performers are likely to give up in a reward tournament, low performers in a reward and punishment tournament are motivated to perform better to avoid the punishment.

Another study that provides additional insights into RPI's effect on employee performance in tournament settings is He (2021). In this study, He examines how employees' knowledge of the difference in employees' abilities affects employees' performance when provided with RPI. He finds that RPI has a larger positive effect on employee performance when employees know they are competing against other employees of similar skill levels (i.e., high performers vs. high performers, low performers vs. low performers) compared to when the employees know they are competing against employees of different skill levels (i.e., high performers vs. low performers) or

do not know the skill level of the other employees. He argues that this occurs because, just as in the basic tournament, the combination of RPI and knowledge of the ability of other employees causes employees to adjust their effort based on their expectations of winning the tournament.

3.0 Experimental Study

3.1 Introduction

This chapter presents my original research study that examines how employee performance is affected by RPI when the employee's supervisor is present. As providing employees with RPI has become more common in practice, considerable research has focused on how providing employees with RPI affects their performance (Blanes i Vidal and Nossol 2012; Tafkov 2013; Newman and Tafkov 2014; Azmat and Iriberry 2016; Eyring and Narayanan 2018; Eyring et al. 2021). In such studies, researchers typically consider settings in which employee compensation is not tied to relative performance and examine the effect of RPI by comparing employee performance when employees are provided with RPI versus when they are not. These studies find higher performance when employees are provided with RPI compared to when they are not, and such results have been interpreted as evidence that providing employees with RPI increases employee performance. This increase in performance is attributed to social comparison; i.e., employees compete to outperform their coworkers to increase their self-image.

However, these studies that find a positive effect of RPI on employee performance do not consider a significant factor in many real world settings: the presence of a supervisor. Interestingly, there are two studies, Chan (2018) and Fisher et al. (2002), that use experimental settings in which a supervisor plays a significant role, and both studies fail to find a positive effect of RPI on employee performance. My study directly addresses Chan's call to further study whether the presence of a supervisor can explain why he finds no evidence of a positive effect of providing RPI on employee performance.

When a supervisor is present, employees often want to impress their supervisor (Gardner and Martinko 1988, Bolino et al. 2008, Bolino et al. 2016, Leary and Kowalski 1990, Ralston 1985, Thomas and Thornock 2022). One way that employees can try to impress their supervisor is by outperforming their coworkers. This can lead to higher employee performance when a supervisor is present. Thus, both the presence of a supervisor and RPI would be expected to separately prompt a positive response in employee effort (i.e., induce competition among employees). However, an important unanswered question is what the combined effect of these two factors would be on employee performance.

Specifically, when a supervisor is present, the incremental effect of providing RPI on employee performance may be less than the incremental effect of providing RPI when no supervisor is present. This could occur for two reasons. First, when a supervisor is present, employees may be so heavily focused on impressing their supervisor that they pay little or no attention to trying to boost their self-image by comparing themselves to their coworkers. Alternatively, because the presence of a supervisor already provides strong motivation for employees to perform well, it may be that there is little room for incremental improvement in performance by also providing them with RPI.

I conduct a laboratory experiment specifically designed to examine whether there is an incremental effect of RPI on employee performance when a supervisor is present compared to the effect of RPI on performance when no supervisor is present. In my experiment, participants in the role of employees complete a task within an assigned group. Using a between-participants design, I manipulate whether the employees in each group (1) have or do not have RPI, and (2) are or are not overseen by a supervisor (i.e., a supervisor is present or absent). I first replicate the prior research by providing evidence that, when no supervisor is present, performance is higher when

employees are provided with RPI than when they are not. Next, I show that, when RPI is not provided, employee performance is higher when a supervisor is present than when no supervisor is present. That is, I provide evidence that, as predicted, there is a separate impression management effect on employee performance. Finally, consistent with my predictions, I provide evidence that the replicated effect of RPI on employee performance is eliminated when a supervisor is present.

My study makes several contributions to the management accounting literature and practice. First, my results help explain why Chan (2018) and Fisher (2002) do not find an effect of RPI on employee performance. Chan (2018) speculates that because the employees in his No RPI condition knew they were being evaluated by a supervisor, they may have already increased their performance to a level equal to the level of performance induced by social comparison in the RPI condition. My study directly tests this possibility and provides evidence consistent with Chan's speculation. My results question the widely-held view expressed in prior studies that providing employees with RPI likely increases their performance in practice. This is especially important since some prior studies have found that providing RPI can negatively affect employee behaviors other than performance that are valued by the firm such as information sharing (Berger et al. 2019) and employees helping each other (Wang 2017; Black et al. 2019). Thus, there could be a net negative effect of providing employees with RPI in practice if doing so results in little or no improvement in their performance. As such, it is important for top management to understand the overall effects of RPI on employee behavior when assessing the benefits and cost of providing employees with RPI.

Second, while other RPI studies focus on social comparison and the attendant concern for self-image, my study adds to the RPI literature by introducing how someone else's view (i.e., the supervisor's view of the employee) affects employee performance. My goal is to provide a more

complete understanding of how these two forces affect employee performance when both are present. This understanding can help practitioners decide which policies are likely to improve overall firm performance.

Finally, my study has methodological implications for future RPI research. Previous research appropriately focused on employees and their coworkers to isolate the effects on employee performance of the social comparison induced by RPI. While experiments that are primarily focused on the theoretical constructs may want to continue to exclude a supervisor from their setting, my findings imply that experiments designed to better understand the practical effects of RPI should likely include a supervisor in their settings.

3.2 Hypothesis Development

3.2.1 Relative Performance Information and Social Comparison

When employees' relative performance does not directly affect their compensation, conventional economic reasoning predicts that providing them with RPI will not affect their performance (Frederickson 1992; Hannan et al. 2008). Nevertheless, prior findings suggest that even when employee pay is not tied to relative performance, providing versus not providing employees with RPI positively affects their performance under both fixed contracts (Kerr et al. 2007; Tafkov 2013) and individual performance-based contracts (Hannan et al. 2008; Tafkov 2013). For consistency with such previous research, I study a setting in which employee compensation is not directly tied to their relative performance.

Social comparison theory predicts that providing employees with RPI increases employee effort and performance (Festinger 1954) even when employee compensation is not tied to relative performance. The underlying logic is that individuals compare themselves to others because of an innate drive for humans to evaluate their own abilities in comparison to others (Suls and Wheeler 2000; Brown et al. 2007). Individuals make such comparisons to increase their self-image (Smith 2000). To increase their self-image, employees compete to outperform other employees (Brown et al. 2007; Garcia and Tor 2007). That is, competition with other employees motivates them to provide more effort leading to an increase in performance even when compensation is not tied to their relative performance.

In accounting experiments, researchers typically document RPI's effect on employee performance by comparing the performance of participants who have RPI to participants who do not have RPI (Hannan et al. 2008; Hannan et al. 2013; Newman and Tafkov 2014; Tafkov 2013; Yatsenko 2018). Such studies typically find higher employee performance when participants are provided with RPI compared to when they are not. I expect to replicate this finding in a setting in which no supervisor is present. Therefore, my first hypothesis is:

H1: When no supervisor is present, employee performance will be greater when employees have RPI than when they do not.

3.2.2 Presence of a Supervisor and Impression Management

Impression management is defined as any action taken by an individual to create or maintain a specific identity in the view of others (Bozeman and Kacmar 1997). Impression management theory proposes that individuals care about how others view them and generally want others to view them positively (Gilmore and Ferris 1989; Liden and Mitchell 1988; Ralston 1985).

Because employees are typically concerned about how their supervisor views them (Gardner and Martinko 1988, Mecham 2019), employees who want to be viewed positively by their supervisor are likely to engage in impression management.⁴

Based on impression management theory, I expect that when a supervisor is present employees will try to outperform their coworkers in order to impress their supervisor. Specifically, when employees know their supervisor has relative performance information about them and their coworkers, they will try to impress their supervisor by outperforming their coworkers. Outperforming their coworkers will cause their supervisor to view them as more competent, skilled, and/or hard-working. Thus, the desire to impress their supervisor will motivate employees to provide more effort to achieve higher performance when a supervisor is present as compared to when no supervisor is present.

For employees to use outperforming their coworkers as an impression management strategy, employees must know their supervisor has information about their relative performance. This is because a supervisor cannot be impressed with an employee's relative performance if the supervisor does not have such information. Thus, a necessary condition for the presence of a supervisor to cause employees to engage in impression management is that the supervisor has employee performance information and employees know the supervisor has such information. This leads to my second hypothesis:

H2: When a supervisor is present and has RPI information, employee performance will be higher than when no supervisor is present.

⁴ The strength of an employee's desire to impress their supervisor could depend on several factors, including the employee's relationship with the supervisor, etc. While these factors are important, they are beyond the scope of this study.

3.2.3 Joint Effect of RPI and the Presence of a Supervisor

My main research question is whether the presence of a supervisor can help explain why some studies find higher employee performance when employees have RPI while others do not. This requires comparing the effect of RPI on employee performance when no supervisor is present (as tested in H1) to the effect of RPI on employee performance when a supervisor is present.

I expect the incremental effect of RPI on employee performance when a supervisor is present to be less than the incremental effect of RPI when no supervisor is present for two reasons. First, rather than being motivated by both RPI and the presence of a supervisor, employees may attend to only one of these factors. Specifically, I expect that employees may be so focused on impressing their supervisor that they no longer focus on trying to boost their self-image when provided with RPI.

Second, as explained in sections 3.2.1 and 3.2.2, both RPI and the presence of the supervisor prompt employees to try to outperform their coworkers. RPI prompts this behavior through social comparison and employees' desire to boost their self-image. The presence of a supervisor prompts this behavior through impression management, i.e., employees' desire to boost their image in the eyes of their supervisor. Because both RPI and the presence of a supervisor motivate employees to increase their performance, there may not be a further significant increase in employee motivation when both of these factors are present compared to when only one is present. Specifically, I expect that employees who are already highly motivated to outperform their coworkers to impress their supervisor may not have much room to increase their performance if they are provided with RPI.⁵

⁵ I use post-experimental questionnaire (PEQ) data to try to distinguish between these explanations.

I note that in either scenario described above I expect the presence of the supervisor to have a more dominant influence on employee performance than the availability of RPI. Based on these arguments, my third hypothesis is:

H3: The positive difference in employee performance between providing versus not providing RPI will be smaller when a supervisor is present than when no supervisor is present.

It is important to note that while some previous studies provide evidence that RPI has a positive effect on performance when a supervisor is present (Azmat and Iriberry 2010; Blanes I Vidal and Nossol 2011, Eyring et al. 2021), these studies cannot determine if the magnitude of the RPI effect they observe is the same as it would be if there were no supervisor present. That is, because they do not manipulate the presence versus absence of a supervisor, these studies cannot determine if the positive effect of RPI on performance is muted by the presence of a supervisor or whether it is just as strong as it would have been in the absence of a supervisor. In contrast, my manipulations allow me to test this issue directly. As suggested earlier in Chapter 2.0, this is important because RPI can negatively affect other behaviors valued by firms such as information sharing (Berger et al. 2019) and helping other employees (Wang 2017; Black et al. 2019). Thus, if the benefits of providing RPI on employee performance are reduced or eliminated when a supervisor is present, firms may not want to provide RPI to employees to avoid the other negative consequences of doing so.

3.2.4 Joint Effect of RPI and the Presence of a Supervisor who Awards a Bonus

Thus far I have considered how the *presence* of a supervisor generally could increase employee performance. However, when supervisors make decisions that have an explicit economic

impact on employees, e.g., deciding whether to give employees a bonus or raise, employees have both behavioral and explicit economic reasons to impress their supervisor (Gardner and Martinko 1988, Bolino et al. 2008, Bolino et al. 2016, Leary and Kowalski 1990, Ralston 1985, Thomas and Thornock 2022). Thus, employees could try to impress their supervisor not only for behavioral reasons such as to be liked or seen as competent,⁶ but also to try to get their supervisor to reward them financially by giving them a bonus or raise.

It is important to study both a setting in which employees have an explicit economic reason to impress their supervisor and a setting in which they do not for several reasons. First, both settings occur in practice. That is, there are settings in which the economic incentives for employees to impress their supervisor are weaker or less explicit (see Blanes i Vidal and Nossol 2011), but also other settings in which employees have stronger and more explicit economic incentives to impress their supervisor. Second, the effect of the presence of a supervisor on employee performance could be stronger when employees have explicit economic reasons to impress their supervisor than when the economic incentives are less explicit and thus less salient. As such, explicit economic incentives for employees to impress their supervisor could increase the likelihood of finding support for H3. Third, having both behavioral and explicit economic reasons to impress a supervisor is more in line with the settings in Chan (2018) and Fisher et al. (2002), the two prior experiments that did not find an effect of RPI on employee performance.

In order to investigate the importance of explicit economic incentives for finding support for H3, I examine an additional condition in which employees know that their supervisor will

⁶ Earlier I described the behavioral effect on employee effort arising from social comparison, i.e., employees' desire to boost their self-image by outperforming their coworkers. Here I am describing a different effect on employee effort that arises for behavioral reasons, employees' desire to boost their image in the eyes of their supervisor. This behavioral reason why employees may engage in impression management is also distinct from the economic reasons why employees may engage in impression management.

award a subjective bonus to one employee after observing the performance of all the employees. On the one hand, it may be that when a supervisor is present and there is no explicit incentive for employees to impress their supervisor (i.e., the supervisor does not award a bonus), the behavioral reasons for employees to impress their supervisor are sufficient to provide support for H3. That is, support for H3 could be very similar whether employees do or do not have explicit economic incentives to impress the supervisor. On the other hand, the behavioral reasons to impress a supervisor may not be sufficiently strong to reduce the difference in performance between employees who have RPI versus those who do not have RPI as compared to when no supervisor is present. That is, H3 may not be supported, or the support for H3 could be weaker, when the economic incentives for employees to impress their supervisor are not explicitly stated (i.e., the supervisor does not award a bonus).

Thus, I test the following research question:

RQ: Does support for H3 depend on whether the economic incentives to impress the supervisor are or are not explicitly stated?

3.3 Method

3.3.1 Participants

Participants were recruited from undergraduate and graduate business school classes at a large university. All participants received a flat wage for completing the experiment (\$9.50) and, as described in more detail later, also earned money based on their performance on the experimental task in a training period. Each participant was randomly assigned to one of the six

experimental conditions described below and completed the study in a computer research lab using the LIONESS platform (Giamattei et al. 2020).⁷ Because this study was conducted using a single computer research lab, several experimental sessions were conducted for each of the six experimental conditions, with each session being assigned to only one of these conditions.

3.3.2 Overview of Experimental Design

To test my hypotheses and research question, I use the 2 X 3 between-participants experimental design depicted in Figure 1 Panel A. As explained in more detail later, my main dependent measure is total employee performance on an experimental task performed over seven work periods.⁸ I manipulate the presence of RPI at two levels: *RPI* and *No RPI*. In the *RPI* condition, employees receive feedback about their performance rank on a task relative to the other employees in their group (i.e., RPI) after each of the seven work periods. In the *No RPI* condition, employees do not receive any performance rank feedback. I manipulate the presence of a supervisor at three levels. In the *No Supervisor (NoSup)* condition, there is no mention of a supervisor to the employees. In the *Supervisor (Sup)* condition, a supervisor is present and employees know that their supervisor has access to RPI about the employees in their group after each period. The *Supervisor Awards Bonus (SupBonus)* condition is the same as the *Sup* condition except for the supervisor also subjectively awards a bonus to one employee in their group in the final work period. Figure 1 Panel B indicates which specific cells I use to test my hypotheses and research question. Details regarding these tests are provided when reporting my results.

⁷ LIONESS is a web-based platform constructed specifically for interactive experiments. See lioness-lab.org for more details.

⁸ As explained in the Results section, I use training period performance as a control variable. Thus, I test and report the adjusted means of total employee performance after controlling for performance in the training period.

Figure 1 Experimental Design

Panel A - 2 X 3 Design

		Supervisor Manipulation		
		No Supervisor (NoSup)	Supervisor (Sup)	Supervisor Awards Bonus (SupBonus)
RPI Manipulation	No RPI	Cell 1	Cell 3	Cell 4
	RPI	Cell 2	Cell 4	Cell 6

Panel B – Hypotheses Tests

H1: When no supervisor is present, employee performance will be greater when employees have RPI than when they do not. Cell 2 > Cell 1. Replication of RPI effect.

H2: When a supervisor is present and has RPI information, employee performance will be higher than when no supervisor is present. Cell 3 > Cell 1. Evidence of impression management effect.

H3: The positive difference in employee performance between providing versus not providing RPI will be smaller when a supervisor is present than when no supervisor is present. Test 2 X 2 interaction of cells 1, 2, 3, and 4. The difference between Cell 2 and Cell 1 will be greater than the difference between Cell 4 and Cell 3.

RQ: Does support for H3 depend on whether the economic incentives to impress the supervisor are or are not explicitly stated? Test 2 X 2 interaction of cells 1, 2, 5, and 6.

3.3.3 Procedures

In the experiment, participants assumed the role of either an employee or a supervisor in their assigned experimental condition. All employees completed a work period in which they

worked on the slider task described below and then received performance information about their personal performance. In conditions with a supervisor, employees' work was overseen by a supervisor. This process of completing a work period and then receiving personal performance information was repeated for each of the seven work periods.

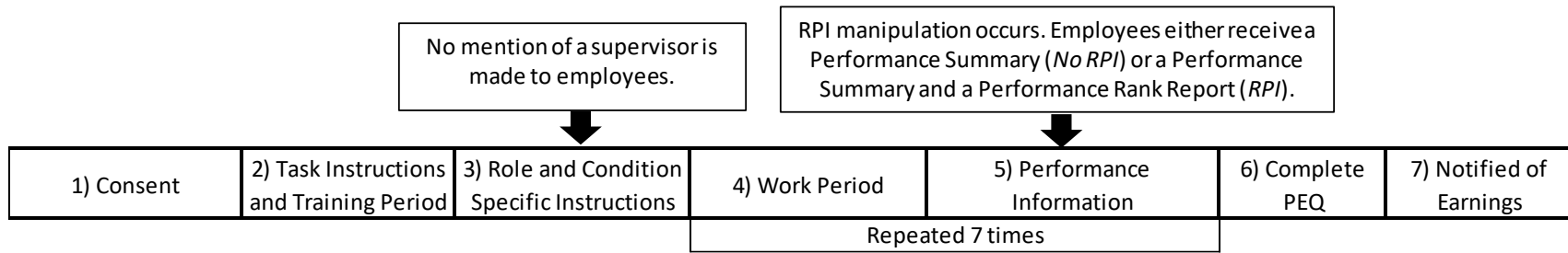
I use a slightly adapted version of the basic slider task used by Chan (2018).⁹ In each work period, employees saw a web page with 40 sliders. Employees needed to adjust each slider from its original position of 0 to a required position (e.g., 35). The required position of each slider was randomly determined beforehand, and all employees saw the same order of required slider positions. My main dependent variable is employee performance measured as the cumulative number of correctly completed sliders (i.e., the slider has been moved to the required position) over the seven work periods.

Figure 2 provides timelines showing the steps in my experiment for the different conditions. I first describe the steps and procedures for the *NoSup* conditions and then describe how the steps and procedures are modified in the *Sup* and *SupBonus* conditions.

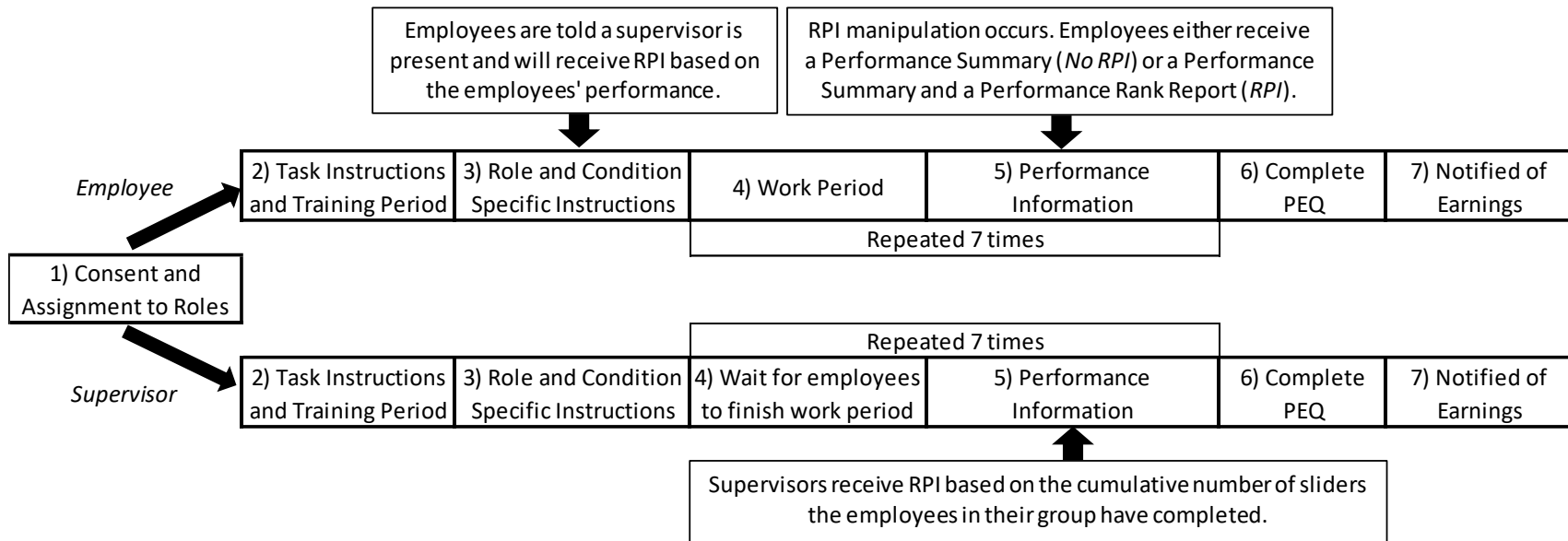
⁹ Chan's (2018) basic slider task requires participants to move each slider to the position 50; my slider task varies the position required for each slider. This is to discourage participants from using their first correctly completed slider as a guide to help them complete the other sliders, as suggested by Gill and Prowse (2015).

Figure 2 Experiment Timeline

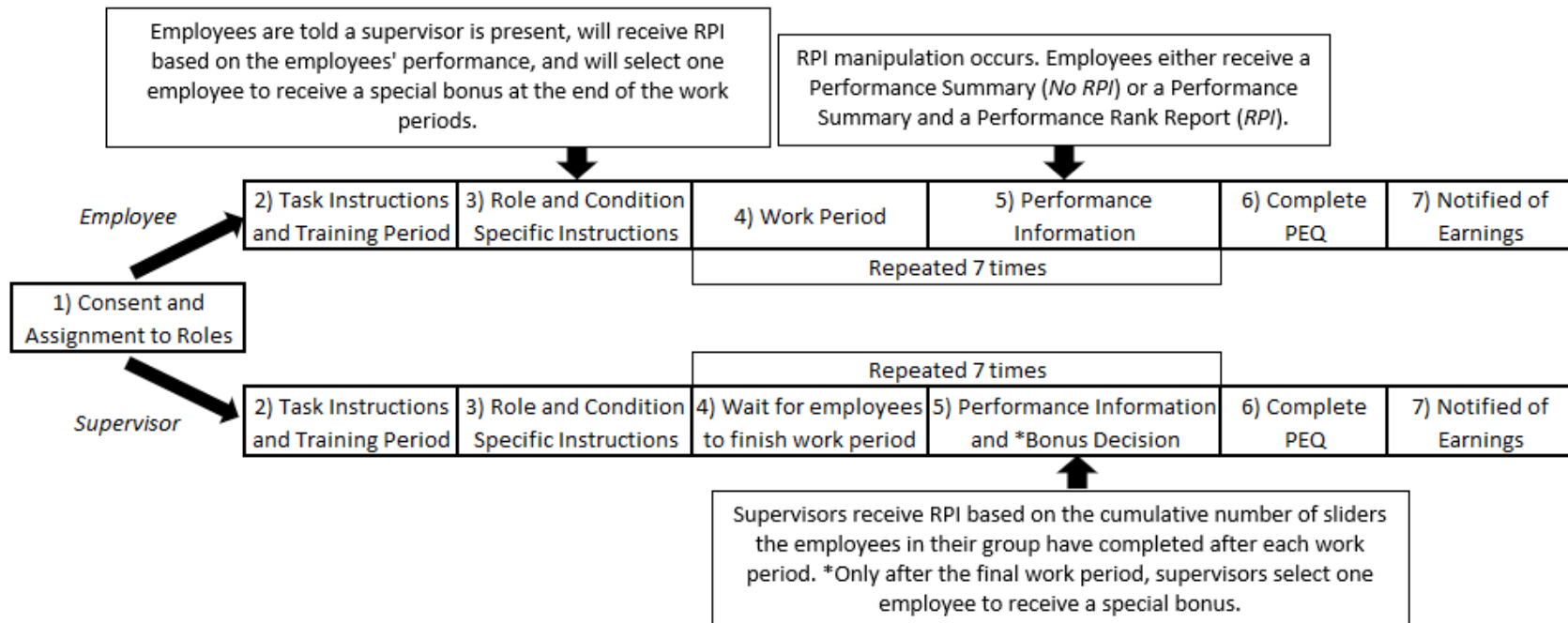
No Supervisor Condition (*NoSup*)



Supervisor Condition (*Sup*)



Supervisor Awards Bonus (*SupBonus*)



3.3.3.1 *NoSup* Conditions

In step 1, participants provide consent to participate, after which they enter a virtual lobby where they wait for other participants to consent to participate. Once four participants are in the waiting lobby, the software identifies them as a complete group of four employees and takes them to the instructions page. These groups of four employees are fixed throughout the experiment.

In step 2, instructions on how to complete the slider task are read aloud as employees followed along. All participants then performed the slider task for a 60-second training period to familiarize themselves with the task. Participants were paid \$0.05 per completed slider during the training period to encourage them to take the task seriously because performance in the training period would be used to control for differences in ability in subsequent statistical tests.

In step 3, instructions for the specific RPI condition within the *NoSup* condition (*No RPI* or *RPI*) were read aloud as employees followed along. Importantly, no mention of a supervisor is made to employees in either the *No RPI* or *RPI* conditions within the *NoSup* condition to make it less likely that employees would think about a supervisor. Additionally, all employees in both *NoSup* conditions were told they would receive a Performance Summary after each work period identifying how many sliders they personally completed in that period. Only employees in the *RPI* condition were told they would also receive an Individual Rank Report. This Individual Rank Report operationalizes the RPI manipulation by showing the ranks of the employees in the four-member group based on their relative cumulative performance. The specific wording used to inform employees of the performance summary and performance rank report is “you will receive a Performance Summary” in the *No RPI* condition, or “you will receive a Performance Summary

and an Individual Rank Report” in the *RPI* condition.¹⁰ After reading the instructions specific to their condition (i.e., *No RPI* or *RPI*), but before the first work period began, each group of employees was told to stand up and recognize the other employees in their group.¹¹

Employees began the first work period in step 4, with steps 4 and 5 being repeated for each of the seven work periods. In step 4, employees completed a 90-second work period in which they worked on the slider task. In step 5, employees received their performance information, either the Performance Summary in the *No RPI* condition or the Performance Summary and the Individual Rank Report in the *RPI* condition.

After the final (seventh) work period was completed in step 5, in step 6 employees completed the post-experimental questionnaire (hereafter, PEQ), and then were notified of their total earnings, which consisted of the flat fee of \$9.50 plus their earnings from the training period, in step 7.

3.3.3.2 *Sup* Conditions

Participants in the *Sup* conditions follow the same general procedures as those described above for the *NoSup* conditions with several necessary modifications as described next.

In step 1, after five participants (rather than four in the *NoSup* conditions) provide consent and enter the virtual lobby, one participant is randomly assigned to the role of supervisor, and the remaining four participants are assigned as the four employees for the group. Participants were not

¹⁰ While irrelevant for the *NoSup* conditions, this wording is intentionally vague as to the source of the information to make it less likely that employees in the *Sup* and *SupBonus* conditions will consider whether their supervisor *chose* to give them the RPI information. This also helps to avoid a compound manipulation, i.e., whether a supervisor is present and whether a supervisor *chooses* to provide employees with RPI in the *RPI* conditions. Thus, to maintain consistency, I use this same wording across the *NoSup*, *Sup*, and *SupBonus* conditions.

¹¹ This was done to increase the salience of social comparison for those in the *RPI* conditions and the salience of a supervisor in the *Sup* and *SupBonus* conditions. A similar approach has been used in previous research (Tafkov 2013).

informed of their role assignment until step 3 so that participants' role would not influence their behavior during the training period.

In step 2, all participants (i.e., both supervisors and employees) complete the training period. I had supervisors complete the training period so they would understand the task that their four employees were performing during the work periods.

In step 3, participants are informed of their role assignment and follow along as instructions specific to their role (i.e., employee or supervisor) and conditions (i.e., *No RPI* or *RPI*) were read aloud. Importantly, employees were informed that their supervisor would have relative performance information about the four employees in their group. Thus, employees knew that the supervisor had RPI, fulfilling the necessary condition described when developing H2. Additionally, when groups were asked to stand up to recognize who was in their group, the supervisor was told to raise their hand to make sure employees knew who their supervisor was. This was done to increase the salience of the supervisor.

In step 4, the supervisor waited for 90 seconds while the employees completed the work period, after which the supervisor received the Performance Rank Report in step 5.

3.3.3.3 *SupBonus* Conditions

The procedures for participants in the *SupBonus* conditions were the same as those for the *Sup* conditions except that the supervisor also selected an employee to receive a special bonus after all work periods were completed. Thus, in step 2, employees were also told the supervisor would select one employee to receive a special bonus (equal to \$1.50) after the seventh work period. Additionally, in step 5 of the last work period, supervisors selected an employee to receive the bonus, which increased the total earnings for that employee in the experiment.

3.3.4 Post-Experimental Questionnaire

After completing the experimental procedures, participants in all conditions completed a PEQ. The PEQ had three parts: process measures, manipulation checks, and demographics. Participants assigned the role of employee completed all three parts, while participants assigned to the role of supervisor only completed the demographics part. In the process measure section, participants in all conditions responded to questions designed to measure their level of social comparison engagement, while participants in the *Sup* and *SupBonus* conditions also responded to questions designed to measure their level of impression management engagement (details provided later).¹² Manipulation check questions were included to check the effectiveness of my manipulations of the presence or absence of RPI and the presence or absence of a supervisor. All participants were asked to identify whether they received RPI (i.e., received the Individual Rank Report) and whether their group was overseen by a supervisor. Additionally, participants assigned to a supervisor condition were asked to identify whether the supervisor selected one employee from their group to receive a bonus. Finally, demographic data collected included age, gender, and year in school.

¹² Only participants in the *Sup* and *SupBonus* conditions were asked questions regarding their impression management engagement because participants in the *NoSup* conditions did not have a supervisor, thus the questions of how much they wanted to impress their supervisor would not have made sense to them.

3.4 Results

Two hundred nine (209) participants completed the study over 35 experimental sessions, 183 in the role of an employee and 26 in the role of a supervisor. Sixty-five (65) percent of participants were female, 11.5 percent were graduate students, and their average age was 20.43 years.¹³ Participants earned on average \$10.17.

Table 2, Panel A reports Employee Performance, the standard deviation, and the number of participants for the *No RPI – NoSup*, *RPI – NoSup*, *No RPI – Sup*, and *RPI – Sup* conditions. Each employee’s performance is calculated as the cumulative number of correctly completed sliders over the seven work periods. Employee Performance reported in Table 2 is the mean of the performance of the individual employees in each condition after adjusting for differences in ability by statistically controlling for their performance in the training period.¹⁴ Thus, Employee Performance reported in Table 2 and shown in Figure 3 should reflect differences in effort due to my manipulations rather than differences in ability. These are the dependent measures that are used in all of my statistical tests of Employee Performance because in all of those tests I include training period performance as a covariate.

¹³ The percentage of graduate students and the average age was higher in the *No RPI – NoSup* condition than in the other conditions. If I control for these variables, my results are unchanged. There are no other significant demographic differences between conditions.

¹⁴ Other studies use initial performance to control for individual characteristics (He 2021). Anecdotally, in testing my instrument I observed significant variation in individuals’ ability to complete the slider task. This is supported in the training period data where the average number of sliders completed was 11.057 with a standard deviation of 3.97. The average number of sliders and standard deviation in the training period did not differ between conditions. Thus, controlling for differences in employees’ ability should decrease the amount of noise in my results.

Table 2 Primary Dependent Variable - Employee Performance (Number of Sliders Completed)

Panel A – Adjusted Cell Means, Standard Deviation, and Cell Sizes

		Supervisor Manipulation^b	
		<i>No Supervisor (NoSup)</i>	<i>Supervisor (Sup)</i>
RPI Manipulation^a	<i>No RPI</i>	162.68 ^c [St.Dev=25.24] (n=39) ^d	175.47 ^c [St.Dev=25.24] (n=24)
	<i>RPI</i>	173.24 ^c [St.Dev=25.27] (n=40)	171.92 ^c [St.Dev=25.24] (n=28)

^a RPI is manipulated at two levels: Participants in the *No RPI* condition do not receive RPI. Participants in the *RPI* condition are informed of their relative rank among the group of four workers they are assigned to after every work period.

^b This table presents data for two levels of the presence of a supervisor manipulation: *No Supervisor (NoSup)* and *Supervisor (Sup)*. There is no mention of a supervisor to the participants in the *NoSup* condition. In the *Sup* condition, participants know that a participant assigned to the supervisor role receives an RPI report after each work period.

^c The main dependent variable, employee performance, is the cumulative number of sliders correctly completed by employees over all 7 work periods. Because I control for training period performance, the adjusted means (i.e., means after controlling for training period performance) are presented.

^d One group only had 3 participants. Because this was in the *No RPI - NoSup* condition, it is unlikely that not having exactly 4 participants in a group affected employees' performance. The results remain unchanged if I remove this group.

Panel B – One-way ANCOVA for RPI's Effect on Employee Performance When No Supervisor is Present

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>RPI (H1)</i>	1	2,257.21	3.78	.056 (.028)
Training Period Performance	1	33,347.63	84.26	<.001
Residual	76	596.66		
Total	78	1025.50		

Panel C – One-way ANCOVA for the Effect of the Presence of a Supervisor on Employee Performance When Employees Don't Receive RPI

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>Sup</i> (H2)	1	2,349.74	3.63	.062 (.031)
Training Period Performance	1	41,786.49	64.57	<.001
Residual	60	647.18		
Total	62	1,346.01		

Panel D – Two-way ANCOVA for the Effect of RPI and the Presence of a Supervisor on Employee Performance

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>RPI</i>	1	382.96	0.60	.440 (.220)
<i>Sup</i>	1	1026.09	1.61	.207 (.103)
<i>RPI*Sup</i>	1	1552.50	2.44	.121 (.060)
Training Period Performance	1	53650.52	84.26	<.001
Residual	126	636.76		
Total	130	1055.30		

Panel E – Test of Simple Main Effects on Employee Performance

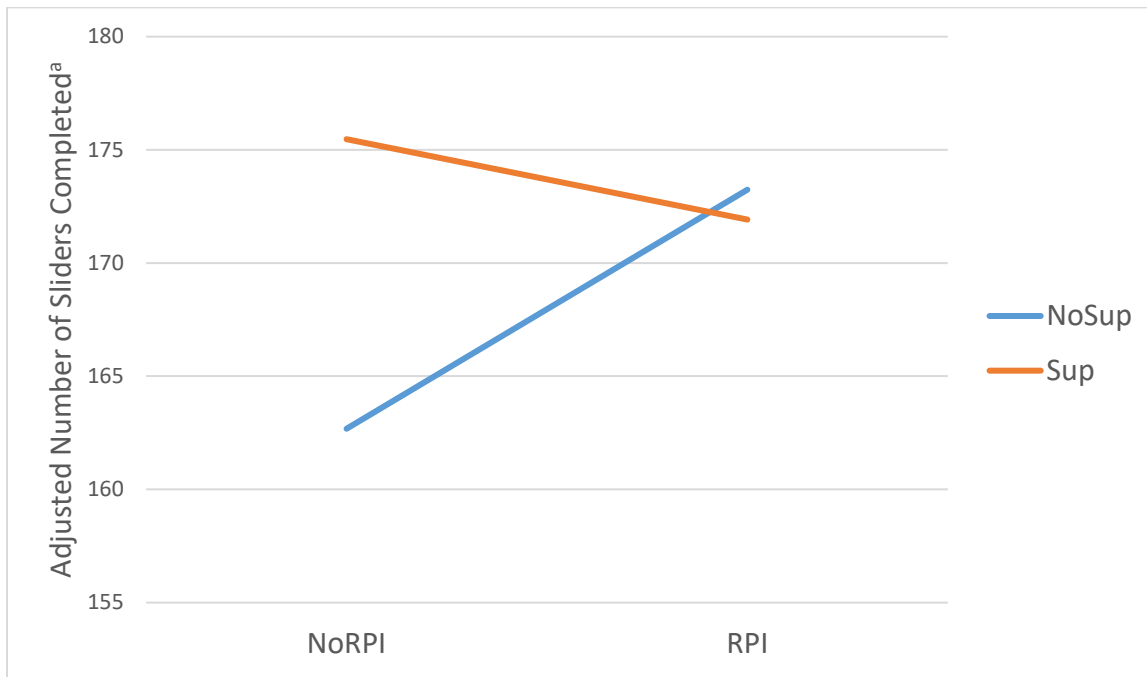
RPI Simple Effects

<u>Condition</u>	<u>(df1, df2)</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>NoSup</i> (H1)	(1, 126)	3.44	.066 (.033)
<i>Sup</i>	(1, 126)	0.25	.614 (.307)

Sup Simple Effects^b

<u>Condition</u>	<u>(df1, df2)</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>No RPI</i> (H2)	(1, 126)	3.81	.053 (.027)
<i>RPI</i>	(1, 126)	0.04	.833 (.417)

Figure 3 Effect of RPI and the Presence of a Supervisor on Employee Performance



^aThe total number of sliders completed is adjusted to control for training period performance.

Ninety-five percent of participants correctly identified whether they received RPI and eighty-two percent correctly identified whether a supervisor was present. For both manipulation checks, the majority of participants who *incorrectly* answered the question (5 out of 7 for the RPI question and 22 out of 24 for the presence of a supervisor question) failed to correctly identify the *absence* of the manipulation (i.e., said RPI or a supervisor were present when in fact they were not). Including such data in my analysis biases *against* finding support for my hypotheses because this could artificially inflate employee performance in the *No RPI* and *NoSup* conditions. Therefore, my tests are conservative because I include all observations in my analyses. However, I also conduct all analyses excluding the participants who failed the manipulation checks and all statistical inferences but one are unchanged.¹⁵

3.4.1 Test of Hypothesis 1

My first hypothesis predicts that when no supervisor is present, employee performance will be greater when employees have RPI than when they do not. To test this hypothesis, I compare employee performance in the *No RPI – NoSup* condition to that in the *RPI – NoSup* condition. These conditions most closely replicate the setting in most previous RPI studies. As shown in Table 2 Panel B, employee performance is significantly higher ($p = .028$, one-tailed) in the *RPI – NoSup* condition (173.24) than in the *No RPI – NoSup* condition (162.68).¹⁶ This supports H1 by

¹⁵ The only difference in inferences of my results is if I remove participants who incorrectly answered the manipulation check regarding the presence of RPI, the test of my first hypothesis (i.e., the difference in employee performance between the *No RPI – NoSup* and *No RPI – Sup* conditions) is just outside of traditional significance ($p = .107$, one-tailed). This decrease in significance can be attributed to the increase in the adjusted mean performance of those in the *No RPI – NoSup* condition (166.43), where three of the lowest-performing participants were dropped.

¹⁶ All reported p-values for directional predictions are one-tailed. For non-directional predictions, I use two-tailed p-values and indicate that when reporting the p-value.

replicating the prior finding that providing employees with RPI increases their performance as compared to not providing RPI.

The underlying theory for the difference in performance predicted and found in my test of H1 is that employees' level of social comparison will be higher when they are provided with RPI. Thus, measures of employees' social comparison would be expected to be higher in the *RPI-NoSup* condition compared to the *No RPI – NoSup* condition. Following previous research, I measure employees' social comparison engagement based on employee's responses to two questions: (1) "How often did you think about how your performance compared with the other Workers in your Group?" (*Thinking*) and (2) "How concerned were you about how well you performed relative to the other Workers in your group?" (*Concern*).^{17, 18} Responses to both questions were on a seven-point scale, with endpoints of 1 (Never/Not at all concerned) and 7 (Very often/Very concerned). I use a factor score of these two questions as my measure of social comparison engagement (factor analysis Eigenvalue = 1.14).¹⁹ Table 3, Panel A reports the mean and standard deviations of participants' these social comparison engagement measures for the *No RPI – NoSup*, *RPI – NoSup*. Table 3, Panel B, shows that, consistent with expectations, social comparison engagement is significantly higher ($p < .001$) in the *RPI – NoSup* condition (4.85) than in the *No RPI – NoSup* condition (3.19).

¹⁷ These two questions are adopted from Tafkov (2013). Additionally, a third question regarding social comparison engagement was asked, but not used in the measure of social comparison engagement. I discuss this further after testing H3.

¹⁸ While providing RPI to employees has been shown to increase employees' social comparison engagement, it is reasonable to expect the presence of a supervisor may also increase employees' social comparison engagement. Specifically, even when employees did not receive RPI, they could be concerned about how their performance compared to the other employees when a supervisor was present because they knew the supervisor would view their relative performance. This could lead to a high correlation between employee social comparison engagement and impression management engagement. I discuss this further when testing H2.

¹⁹ Following Tafkov (2013), each participant's factor score is calculated as the weighted sum of their responses to the PEQ questions, with each response weighted by its factor weighting obtained from the factor analysis.

Table 3 Employee Social Comparison Engagement

Panel A – Cell Means, Standard Deviation, and Cell Sizes

		Supervisor Manipulation^b	
		<i>No Supervisor (NoSup)</i>	<i>Supervisor (Sup)</i>
RPI Manipulation^a	<i>No RPI</i>	3.19 ^c [St.Dev=1.53] (n=39)	4.14 ^c [St.Dev=1.53] (n=24)
	<i>RPI</i>	4.85 ^c [St.Dev=1.33] (n=40)	4.33 ^c [St.Dev=1.41] (n=28)

^a RPI is manipulated at two levels: Participants in the *No RPI* condition do not receive RPI. Participants in the *RPI* condition are informed of their relative rank among the group of four workers they are assigned to after every work period.

^b This table presents data for two levels of the presence of a supervisor manipulation: *No Supervisor (NoSup)* and *Supervisor (Sup)*. There is no mention of a supervisor to the participants in the *NoSup* condition. In the *Sup* condition, participants know that a participant assigned to the supervisor role receives an RPI report after each work period.

^c Social comparison engagement is the factor score based on employees' responses to two questions (*Thinking* and *Concern*), each on a scale from 1 to 7, adapted from Tafkov (2013).

Panel B – One-way ANCOVA for RPI's Effect on Social Comparison Engagement When No Supervisor is Present

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed</u>
<i>RPI</i>	1	54.05	26.09	<.001
Training Period Performance	1	0.26	0.13	.723
Residual	76	2.07		
Total	78	2.72		

Panel C – One-way ANCOVA for the Effect of the Presence of a Supervisor on Social Comparison Engagement

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed</u>
<i>Sup</i>	1	13.19	5.57	.022
Training Period Performance	1	0.42	0.18	.675
Residual	60	2.37		
Total	62	2.51		

3.4.2 Test of Hypothesis 2

My second hypothesis predicts that when a supervisor is present and has RPI information, employee performance will be higher than when no supervisor is present. This hypothesis applies only to cases in which employees are not provided with RPI so that the effect of the presence of a supervisor can be isolated from any RPI effect. Thus, to test H2, I compare employee performance in the *No RPI – Sup* condition to the *No RPI – NoSup* condition. As shown in Table 2 Panel C, consistent with H2, I find that employee performance is significantly higher ($p = .031$) in the *No RPI – Sup* condition (175.47) than in the *No RPI – NoSup* condition (162.68). This result is consistent with a significant impression management effect, i.e., when a supervisor is present, employees try to impress their supervisor by increasing their performance to outperform their coworkers.

I use my impression management measures to provide further evidence that the results for H2 reported above result from employees' attempts to manage their supervisor's impressions. In the PEQ, employees responded to three impression management engagement questions: (1) To what extent did you want to impress your Supervisor by outperforming the other Workers in your group? (*Outperform*) (2) To what extent did you want to impress your Supervisor so that they would think highly of you as a worker? (*Think Highly*) (3) To what extent did you want to impress your Supervisor so that they might give you a reward? (*Reward*). Responses were measured on a scale from 1 (Not at all) to 7 (To a great extent). Only employees in conditions with a supervisor present were asked these questions because the questions only made sense for such employees. As for my measure of social comparison engagement, I use factor scores as my measure of impression management engagement.

Table 4, Panel A reports employees' mean impression management engagement and standard deviation for the *No RPI – Sup* and *RPI – Sup* conditions. Because employees in the *NoSup* condition did not answer the impression management engagement questions, I cannot compare impression management engagement between the *No RPI – NoSup* and *No RPI – Sup* conditions. However, because my underlying theory suggests a positive relationship between impression management engagement and employee performance, I can test to see whether such a relationship exists within the *No RPI – Sup* condition. Table 4 Panel B presents the results of a regression analysis showing a significant positive effect (9.15, $p = .004$) of impression management engagement on employee performance. This positive effect provides evidence consistent with the theory that employees' desire to impress their supervisor by outperforming their coworkers increases their performance.

Table 4 Employee Impression Management Engagement

Panel A – Cell Means, Standard Deviation, and Cell Sizes

		Supervisor Manipulation ^b	
		<i>Supervisor (Sup)</i>	<i>Supervisor Awards Bonus (SupBonus)</i>
RPI Manipulation ^a	<i>No RPI</i>	4.64 ^c [St.Dev=1.77] (n=24)	5.56 ^c [St.Dev=1.45] (n=24)
	<i>RPI</i>	4.90 ^c [St.Dev=1.86] (n=28)	4.77 ^c [St.Dev=1.88] (n=28)

^a RPI is manipulated at two levels: Participants in the *No RPI* condition do not receive RPI. Participants in the *RPI* condition are informed of their relative rank among the group of four workers they are assigned to after every work period.

^b This table presents data for two levels of the presence of a supervisor manipulation: *No Supervisor (NoSup)* and *Supervisor (Sup)*. There is no mention of a supervisor to the participants in the *NoSup* condition. In the *Sup* condition, participants know that a participant assigned to the supervisor role receives an RPI report after each work period.

^c Employee impression management is the factor score of employees' responses to three questions (*Outperform*, *Think Highly*, and *Reward*) each on a scale from 1 to 7.

Panel B – Regression of Employee Performance on Impression Management Engagement within the *No RPI – Sup* Condition

<u>Variable</u>	<u>Coefficient</u>	<u>t</u>	<u>p-value two-tailed (one-tailed)</u>
<i>IM</i>	9.15	2.97	.007 (.004)
Training Period Performance	4.21	3.50	.002
Intercept	87.08	5.16	<.001

Panel C – One-way ANCOVA for the Effect of RPI on Impression Management Engagement When Supervisor is Present

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed (one-tailed)</u>
<i>RPI</i>	1	0.87	0.27	.608
Training Period Performance	1	5.89	1.81	.1853
Residual	49	3.26		
Total	51	3.27		

Panel D – Regression of Employee Performance on Impression Management Engagement within the *RPI – Sup* Condition

<u>Variable</u>	<u>Coefficient</u>	<u>t</u>	<u>p-value two-tailed (one-tailed)</u>
<i>IM</i>	-1.51	-0.58	.568
Training Period Performance	4.11	3.41	.002
Intercept	134.42	7.23	<.001

Panel E – One-way ANCOVA for the Difference in Impression Management Engagement Between *No RPI – SupBonus* and *No RPI – Sup* Conditions

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value two-tailed</u>
<i>SupBonus</i>	1	8.78	3.44	.070
Training Period Performance	1	5.74	2.25	.140
Residual	45	2.55		
Total	47	2.78		

Panel F – Regression of Employee Performance on Impression Management Engagement within the *No RPI – SupBonus* Condition

<u>Variable</u>	<u>Coefficient</u>	<u>t</u>	<u>p-value two-tailed</u>
<i>IM</i>	2.77	0.98	.339
Training Period Performance	5.88	4.98	<.001
Intercept	83.47	3.96	.001

While I expect impression management to be the primary factor underlying employees’ response to the presence of a supervisor, social comparison may also play a role. That is, employees’ desire to impress their supervisor is likely to cause employees to want to outperform their co-workers and think about how their performance compares to their co-workers, resulting in increased levels of social comparison when a supervisor is present. As shown in Table 3, Panel C, I find that social comparison engagement is significantly higher ($p = .022$, two-tailed) in the *No RPI – Sup* condition (4.14) than in the *No RPI – NoSup* condition (3.19). Because employees in

these two conditions do not receive RPI, the increase in social comparison engagement is likely due to employees thinking about how they compare to the other employees because of their desire to impress their supervisor by outperforming the other employees in their group.²⁰

3.4.3 Tests of Hypothesis 3

My third hypothesis predicts that the positive effect of RPI on employee performance will be smaller when a supervisor is present than when no supervisor is present. To test this hypothesis, I perform a two-way ANCOVA.²¹ As seen in Table 2, Panel D, I find a significant interaction between RPI and the presence of a supervisor on employee performance ($p = .060$, one-tailed).²² Table 2, Panel E provides a simple effects analysis showing that, consistent with my earlier test of H1, RPI significantly increases performance ($p = .033$, one-tailed) when no supervisor is present (*No RPI* 162.68 vs *RPI* 173.24) but does not significantly affect performance ($p = .614$, two-tailed) when a supervisor is present (*No RPI* 175.47 vs *RPI* 171.92). Additionally, consistent with my earlier test of H2, the presence of a supervisor increases performance ($p = .027$, one-tailed) when employees do not receive RPI (*NoSup* 162.68 vs. *Sup* 175.47) but does not significantly affect performance ($p = .833$, two-tailed) when employees receive RPI (*NoSup* 173.24 vs. *Sup* 171.92).

²⁰ The Pearson correlation between employees' social comparison engagement and impression management engagement in the *No RPI – Sup* condition is 0.676 ($p < .001$). This supports the idea that social comparison and impression management are not mutually exclusive effects. However, it also suggests that social comparison engagement can be prompted by two different factors, providing RPI to employees and the presence of a supervisor. I discuss this more in Section 3.5.

²¹ I also test two sets of custom contrast weights: *No RPI – NoSup* (-4)[-3], *RPI – NoSup* (+1)[+1], *No RPI – Sup* (+1)[+1], and *RPI – Sup* (+2)[+1] and find these contrasts are significant ($p = .037$, two-tailed) [$p = .027$, two-tailed].

²² Because in H3 I predict a specific pattern for my interaction, specifically a negative interaction, it is appropriate to use a one-tailed test. A linear regression test reveals that the coefficient on the interaction term is indeed negative (-14.10).

Overall, these results are consistent with H3. That is, there is no incremental effect of providing RPI to employees when a supervisor is present.

In the development of H3, I suggested two reasons why the effect of the presence of a supervisor could dominate the effect of RPI on employee performance. Employees could focus so heavily on impressing their supervisor that they no longer focus on trying to improve their self-image when provided with RPI, or, alternatively, there is a ceiling effect because employees have already boosted their effort, and thus their performance, so much in response to the presence of a supervisor that there is not much room to increase performance further when also provided with RPI. I next offer some insight into how and why I find support for H3 by examining the combined effects of the presence of a supervisor and RPI on impression management engagement and social comparison engagement.

I first analyze impression management engagement to better understand why I provide support for H3. Table 4, Panel A, shows that, when a supervisor is present, impression management engagement is very similar ($p = .608$ in Panel C) in the No RPI (4.64) and RPI (4.90) conditions. This is consistent with employees continuing to focus on the presence of a supervisor when they are provided with RPI information to the same extent they did when they did not have RPI. That is, the presence of RPI did not cause employees to be less concerned about impressing their manager. This pattern of impression management engagement is, in turn, consistent with employee performance being similar in the No RPI (175.47) and RPI (171.92) conditions when a supervisor is present. Overall, these results suggest that, when a supervisor is present, providing RPI does not incrementally increase employee performance because employees' effort, and thus their performance, has already reached a ceiling because they have worked so hard to impress their supervisor. However, the pattern for employee performance could also reflect the fact that, when

a supervisor is present and RPI is provided, employees limited attention causes them to only attend to the presence of a supervisor and mostly ignore how the relative performance information they are provided affects their self-image. Importantly, consistent with the development of H3, in either case the effect of the presence of a supervisor dominates the effect of RPI.

To offer further insight for why I find support for H3, I also analyze social comparison engagement. As discussed in conjunction with the results for H2, the presence of a supervisor appears to increase social comparison concerns even in the absence of RPI. This is demonstrated by the significant increase ($p = .022$) in social comparison engagement measure from the No RPI-No Sup (3.19) to the No RPI-Sup (4.14) condition reported in Table 3. Moreover, Table 3 also shows that when a supervisor is present, social comparison engagement is quite similar ($p = .625$) when employees are provided with RPI (4.33) and when they are not (4.14). Thus, it appears that providing RPI has no incremental effect on social comparison when a supervisor is present. As for impression management engagement, this similarity in social comparison engagement is again consistent with employee performance being similar in the RPI (171.92) and No RPI (175.47) conditions when a supervisor is present. Also, as for impression management engagement, these results again suggest that, when a supervisor is present, the reason employee performance is similar when employees have RPI compared to when they do not is that the effect of the presence of a supervisor dominates the effect of RPI.

3.4.4 Supplementary Analysis

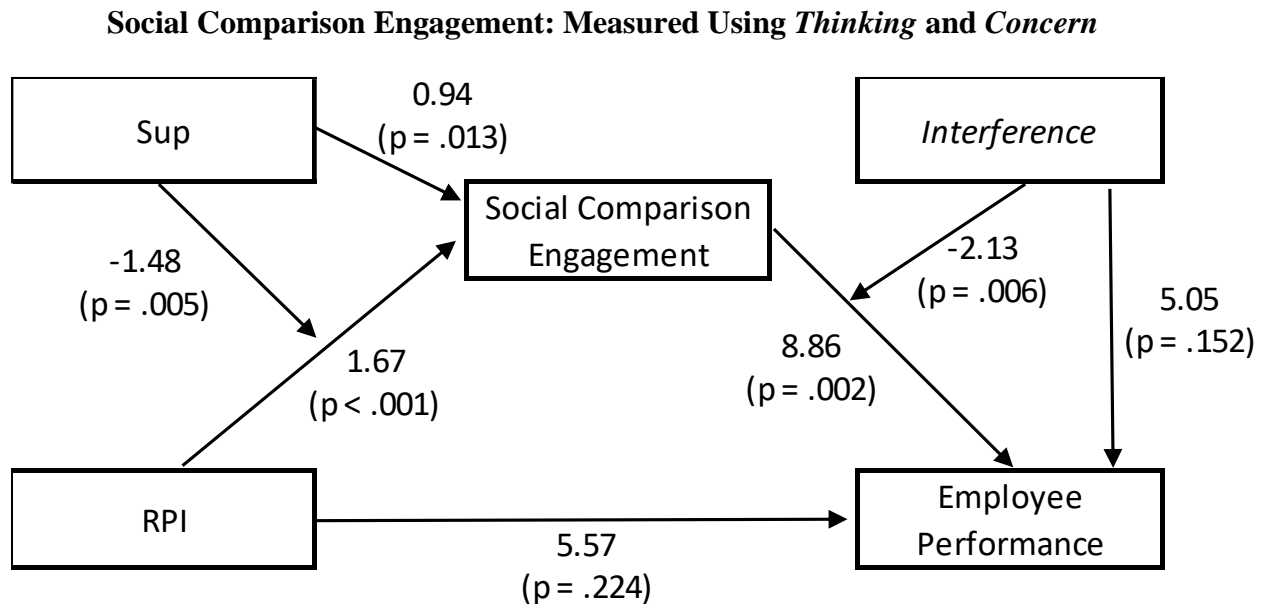
Previous research has shown that the effect of RPI on performance is mediated by the employee's level of social comparison engagement (Tafkov 2013). For completeness, I also test a

modified mediation model that takes into account the specific features of my study. As explained earlier, as in prior research, I expect social comparison engagement to be higher when employees have RPI than when they do not when no supervisor is present. However, I expect the effect of RPI on social comparison engagement to be diminished when a supervisor is present because impression management becomes a more dominant force. Therefore, I include a moderator for the presence of a supervisor in the link between RPI and the mediator, social comparison engagement, in my model (see Figure 4). Of course, the main dependent variable in the model is employee performance and I expect the mediator, social comparison engagement, to positively affect employee performance. As explained previously, I measure social comparison engagement based on employees' responses to the *Thinking* and *Concern* PEQ questions. Participants also responded to a third question related to social comparison, *Interference*, which asked, "To what extent did thinking about how your performance compared with the other Workers in your group interfere with your ability to concentrate on the slider task?" While higher responses to the *Thinking* and *Concern* questions indicate higher levels of social comparison engagement, which are expected to increase performance, the *Interference* question captures the extent to which greater social comparison interferes with, and thus reduces, employee performance.²³ Therefore, the effect of social comparison engagement on performance is expected to depend on participants' level of

²³ The mean responses to the *Interference* question in Tafkov (2013) (*No RPI* = 2.20) (*Private RPI* = 2.25) show that participants in his study did not appear to answer this question differentially across his No RPI and RPI conditions, which is in contrast to my study (*No RPI – NoSup* = 2.64) (*RPI – NoSup* = 3.65) (*NoRPI – Sup* = 3.00) (*RPI – Sup* = 3.61). This explains why responses to this question is an important moderator of the relationship between social comparison and performance in my study but not in his.

reported interference.²⁴ Consequently, I include *Interference* in my model as a moderator of the relation between social comparison engagement and employee performance.²⁵

Figure 4 Moderated-Mediation of Social Comparison Engagement



Index of moderated moderated mediation: 3.14, Confidence Interval (0.55, 6.69)

Regression coefficients and two-tailed p-values for the model based on Hayes (2022) PROCESS macro. Social comparison engagement is the factor score based on the factor analysis of employees' responses to two questions (*Thinking* and *Concern*), while *Interference* is employees' raw score. Each question is on a scale from 1 to 7, adapted from Tafkov (2013).

I use the Hayes (2022) PROCESS macro to test my moderated-mediation model. The results are reported in Figure 4. As expected, there is a significant negative interaction (-1.48, p =

²⁴ For example, social comparison engagement will have a less positive effect on performance for an employee who reported that thinking about how their performance compared with others interfered with their performance than an employee who reported that thinking about how their performance compared with others *did not* interfere with their performance.

²⁵ If the effect of social comparison engagement on performance depends on participants' level of reported interference, participants' responses to the *Interference* question cannot be reverse-coded and included in the general measure of social comparison used to test for a positive relationship with performance. Rather, the most appropriate use of the *Interference* question would appear to be as a *moderator* of the general expectation of a positive relationship between social comparison and performance.

.005, two-tailed) between RPI and the presence of a supervisor on social comparison engagement and a positive significant effect of social comparison engagement on employee performance (8.86, $p = .002$, two-tailed).²⁶ Consistent with the significant interaction, social comparison engagement is significantly higher ($p < .001$) in the RPI (4.85) than No RPI (3.19) condition when no supervisor is present, but not when a supervisor is present (4.33 in the RPI condition and 4.14 in the no RPI condition). This overall pattern of results is consistent with the previously reported findings for H3 that there is no incremental positive effect of RPI on employee performance when a supervisor is present. That is, the positive effect of RPI on social comparison is diminished when a supervisor is present and this, in turn, reduced the difference in employee performance between the RPI and No RPI conditions.

When interpreting the results of this model, it is important to recall that, as shown in the previously reported results for H2, the presence of a supervisor can affect social comparison when employees do not have RPI. Thus, social comparison engagement is not a good measure of social comparison induced by the availability of RPI when a supervisor is present. Consistent with this, as shown in Figure 4, I find that both RPI (1.67, $p < .001$, two-tailed) and the presence of a supervisor (0.94, $p = .013$, two-tailed) independently increase my social comparison engagement measure. The separate effect of the presence of a supervisor is consistent with the previously reported results for H2 showing that the presence of a supervisor significantly increased social comparison engagement even when employees did not have RPI. Therefore, as discussed previously, the social comparison engagement measure in my conditions when a supervisor is

²⁶ Consistent with my expectations, the relation between social comparison engagement and employee performance is significantly negatively moderated by Interference (-2.13, $p = .006$, two-tailed). This suggests that, in general, higher levels of social comparison engagement result in higher performance, but this effect is reduced when the employee feels that engaging in social comparison interfered with their performance.

present appears to capture social comparison due to impression management rather than social comparison induced by RPI. As such, my mediation model results are consistent with my earlier conclusion that the reason that RPI does not incrementally increase employee performance when a supervisor is present is because the impression management induced by the presence of a supervisor dominates the effect of RPI.

3.4.5 Research Question – Supervisor Awards a Bonus

My research question asks whether support for H3 depends on whether the economic incentives to impress the supervisor are or are not explicitly stated.²⁷ My expectation was that support for H3 would be the same or stronger when a supervisor is present and awards a bonus (i.e., employees had an explicit economic incentive to impress their supervisor) as when a supervisor is present but does not award a bonus.

Table 5, Panel A presents the adjusted means for employee performance, standard deviations, and cell sizes for the *No RPI – NoSup*, *RPI – NoSup*, *No RPI – SupBonus*, and *RPI – SupBonus* conditions. Figure 5 presents these adjusted means of employee performance graphically. As can be seen, there is no difference in employee performance between the *No RPI – NoSup* (164.43) and the *No RPI – SupBonus* (165.48) conditions (untabulated ANCOVA $p = .975$, two-tailed). The lack of increase in performance in the *No RPI – SupBonus* condition compared to the *No RPI – NoSup* condition is difficult to explain given the results of my earlier

²⁷ While not the focus of my study, I find that the supervisors in the *SupBonus* conditions chose the highest performing employee to receive the bonus in all but one instance; in that instance the supervisor chose the employee who was the highest performing employee in all but the last round. This is consistent with the results in Chan (2018). As a reminder, the supervisor's compensation was not tied to employee performance to avoid any reciprocity effects.

tests of H2 that showed employee performance increased in the *No RPI – Sup* condition compared to the *No RPI – NoSup* condition. That is, employee performance increased in the *No RPI - Sup* condition in which there are only behavioral reasons to impress the supervisor, but did not increase in the *No RPI – SupBonus* condition in which employees have the same behavioral reasons as well as explicitly stated economic reasons to work hard to impress their supervisor. This unexpected result also explains why there is no significant interaction (Table 5, Panel B, $p = 0.914$) when testing H3 in the same manner as it was tested previously.²⁸

²⁸ While previous RPI research has shown employees may slack-off when they consider a reward unobtainable (Hannan et al. 2008), this cannot explain the lack of the effect of a supervisor who awards a bonus because the employees in this comparison were in the *NoRPI* condition. That is, the employees did not have any information on how they were performing relative to the other employees in their group and thus could not assess the likelihood of being selected for the reward.

Table 5 Employee Performance - *NoSup* vs. *SupBonus*

Panel A – Adjusted Cell Means, Standard Deviation, and Cell Sizes

		Supervisor Manipulation^b	
		<i>No Supervisor (NoSup)</i>	<i>Supervisor Awards Bonus (SupBonus)</i>
RPI Manipulation^a	<i>No RPI</i>	164.43 ^c [St.Dev=22.66] (n=39)	165.48 ^c [St.Dev=22.71] (n=24)
	<i>RPI</i>	175.18 ^c [St.Dev=22.78] (n=40)	177.10 ^c [St.Dev=22.77] (n=28)

^a RPI is manipulated at two levels: Participants in the *No RPI* condition do not receive RPI. Participants in the *RPI* condition are informed of their relative rank among the group of four workers they are assigned to after every work period.

^b This table presents data for two levels of the presence of a supervisor manipulation: *No Supervisor (NoSup)* and *Supervisor Awards Bonus (SupBonus)*. There is no mention of a supervisor to the participants in the *NoSup* condition. In the *SupBonus* condition, participants know that a participant assigned to the supervisor role receives an RPI report after each work period and will select one employee to receive a special bonus after all work periods are completed.

^c The main dependent variable is the cumulative number of sliders correctly completed. Because I control for training period performance, the adjusted means (i.e., means after controlling for training period performance) are presented.

Panel B – Two-way ANCOVA Results

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>F-Statistic</u>	<u>p-value</u>
Intercept	1	140642.98	274.16	<.001
Training Period Performance	1	53974.15	105.21	<.001
<i>RPI</i>	1	3907.74	7.62	.007
<i>SupBonus</i>	1	67.14	0.13	.718
<i>RPI * SupBonus</i>	1	6.04	0.01	.914
Error	126	512.99		

Panel C – Test of Simple Main Effects on Employee Performance

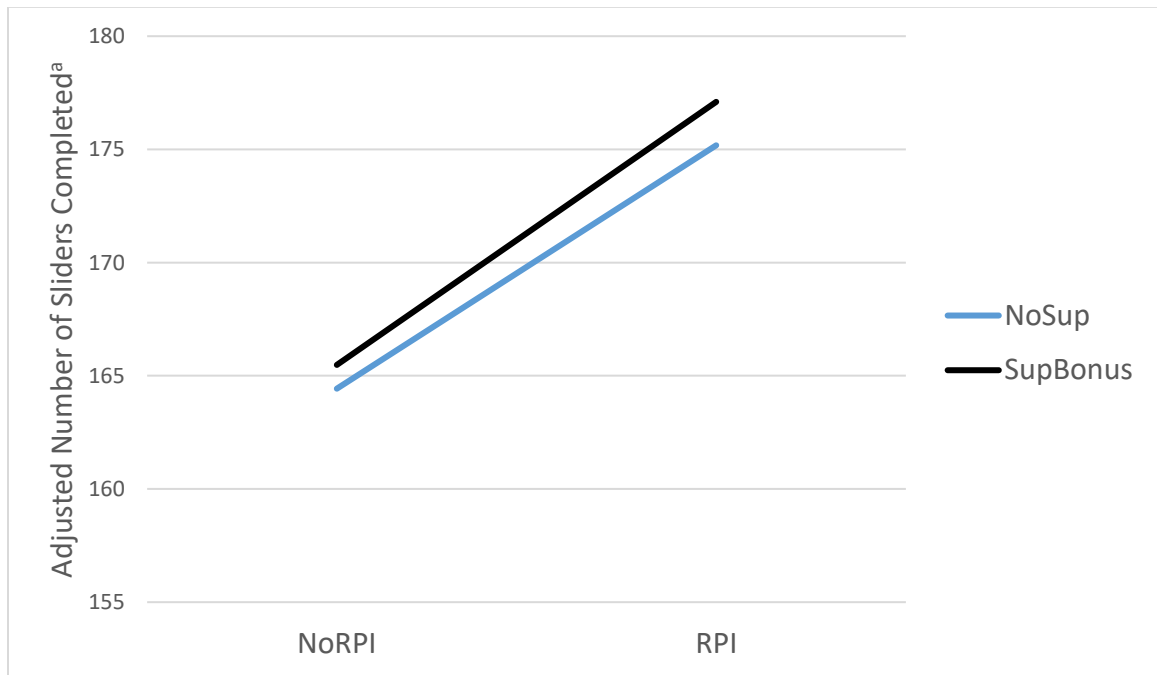
RPI Simple Effects

<u>Condition</u>	<u>(df1, df2)</u>	<u>F-Statistic</u>	<u>p-value two-tailed</u>
<i>NoSup</i>	(1, 126)	4.43	.037
<i>SupBonus</i>	(1, 126)	3.40	.067

SupBonus Simple Effects

<u>Condition</u>	<u>(df1, df2)</u>	<u>F-Statistic</u>	<u>p-value two-tailed</u>
<i>No RPI</i>	(1, 126)	0.03	.860
<i>RPI</i>	(1, 126)	0.12	.734

Figure 5 Effect of RPI and the Presence of a Supervisor who Awards a Bonus on Employee Performance



^a The total number of sliders completed is adjusted to control for training period performance.

Perhaps even more puzzling is that employee performance may actually be *lower* (untabulated ANCOVA, $p = .105$, two-tailed) in the *No RPI – SupBonus* condition (167.10)

compared to the *No RPI – Sup* condition (178.78). This means that when employees have an explicit economic incentive to perform better, they instead perform worse. I know of no theory for my setting that can explain decreased employee performance in the *No RPI -SupBonus* condition. In an attempt to understand these unexpected results, I examine employee impression management engagement across the *No RPI -SupBonus* and the *No RPI -Sup* conditions. Table 4, Panel A reports the mean impression management engagement for the *Sup* and *SupBonus* conditions. Table 4, Panel E shows that impression management engagement is significantly *higher* ($p = .070$, two-tailed) in the *No RPI – SupBonus* condition (5.56) than in the *No RPI – Sup* condition (4.64). This increase in impression management engagement makes the decrease in employee performance even more puzzling.

To summarize, the results in Table 5 Panel A are very difficult to explain because, when employees do not have RPI, the presence of a supervisor who awards a bonus does not increase employee performance compared to when no supervisor is present. Further, a comparison of the *No RPI – SupBonus* and the *No RPI – Sup* conditions shows that when employees have an explicit economic incentive to perform better, they actually perform worse. Because I know of no theory for my setting that could explain these results, I am left to conclude the employee performance data in the *No RPI – SupBonus* condition are unreliable.²⁹ I note that a possible reason for this is that the sample size in that condition is not large. Consequently, I plan to collect additional data to

²⁹ A possible explanation for this puzzling finding may be that employees in the *No RPI – SupBonus* condition experienced choking behavior (Beilock and Carr 2001). If this were the case, it would be reasonable to expect employees in this condition to score higher on the *Interference* question. However, untabulated results show that employees' *Interference* scores were not significantly higher in the *No RPI – SupBonus* condition compared to the other conditions.

increase my sample sizes in this and several other conditions when I am able to recruit more participants.

3.5 Discussion

My study investigates the joint effect of RPI and the presence of a supervisor on employee performance. I provide evidence of separate effects on performance of both RPI and the presence of a supervisor. My results indicate that the incremental effect of RPI on employee performance found in previous studies is eliminated when a supervisor is present and provide some limited evidence that this effect is due to the presence of the supervisor having a more dominant influence on employee performance than the availability of RPI.

My study has significant practical implications. Specifically, my findings relate to settings in which a salient supervisor has RPI regarding employees' performance, and employees know the supervisor has this information. My results suggest that, in such settings, firms should consider whether any benefits of providing employees with RPI outweigh the potential costs when deciding whether to provide RPI. This is important because previous research has shown that providing RPI to employees can have negative effects on employee behaviors such as information sharing (Berger et al. 2019) and employees helping each other (Wang 2017; Black et al. 2019). Thus, if providing RPI to employees when a supervisor is present does not significantly increase employee performance, firms may choose not to provide employees with RPI to avoid the negative consequences of doing so.

My results likely do not apply to all settings in which employees have a supervisor. For example, in the setting used by Blanes i Vidal and Nossol (2011) my results would not be expected to apply. They study warehouse workers in a setting in which it is not clear that the supervisor was salient, and therefore not clear that employees were very focused on trying to impress their supervisor. Specifically, it was not clear if the supervisor already had RPI prior to distributing it to employees. Additionally, the authors indicate that the chance of termination and promotion of employees in their setting was “close to zero.” As such, it is likely that employees were less concerned about trying to impress their supervisor, and this allowed performance to increase when employers were provided with RPI relative to when they were not.

Several other factors that I do not examine in my study could also influence whether the presence of a supervisor will eliminate the incremental effect of RPI. For example, employees’ relationship with the supervisor or the frequency with which a supervisor monitors employees could affect employees’ impression management engagement. Such factors could be examined in future research to see how they affect my findings.

My study also suggests that future RPI research, and more generally research regarding employee performance, should consider the importance of a supervisor in the setting being studied. Studies that focus on specific theoretical arguments and therefore are designed to isolate specific effects may want to continue to downplay or intentionally remove a supervisor from their setting to avoid confounding effects. However, my results suggest that studies that are intended to examine the effects of RPI on employee performance in practice should likely include a supervisor. Excluding a supervisor could result in such studies overstating the potential effect of RPI on employee performance in many actual business settings.

The results of my study also offer new insights regarding the construct of social comparison engagement. I find that employees engage in social comparison when a supervisor is present even when they *do not* receive RPI (i.e., in the No RPI – Supervisor condition). This likely happened because employees were aware that their supervisor knew how their performance compared to other employees. Thus, employees began thinking about how their performance compared to their coworkers because they wanted to impress their supervisor by outperforming their coworkers, even though they would never be informed of their relative performance. This novel result suggests that social comparison engagement can be activated both by providing employees with RPI and by having a salient supervisor that employees want to impress.

Therefore, future research should be mindful of potential confounding variables when measuring social comparison engagement. I propose two potential ways to address this concern. First, the way social comparison engagement is measured could be refined to specifically focus on employees engaging in social comparison for self-image purposes rather than social comparison more generally. Second, research that is focused on the theoretical construct of social comparison prompted by providing employees with RPI should continue to exclude the presence of a supervisor in experimental studies, or control for the salience of the supervisor in archival studies to avoid this confounding effect.

I provide another novel insight regarding social comparison engagement. I find that, while overall increased social comparison engagement leads to higher performance, there can be a small negative effect on employee performance because, for some employees, thinking about how they compared to other employees can interfere with their performance. Future research should be mindful of this potential negative effect of social comparison engagement as well.

It is important to note that my study focuses on employees' desire to impress their supervisor with their performance. There are many other ways outlined in the impression management literature that an employee may impress their supervisor (Bolino et al. 2008; Bolino et al. 2016). Additionally, a limitation of my design is that I am unable to speak to employees' desire to impress their coworkers. Previous research has shown that high performers in a group can draw negative attention from their coworkers (Campbell, Liao, Chuang, Zhou, and Dong 2017). Thus, it may be that, when employees are concerned about impressing their coworkers, employees are less motivated to significantly increase their performance to avoid being viewed as an overachiever by their coworkers.

References

- Azmat, G., & Iriberry, N. (2010). The Importance of Relative Performance Feedback Information: Evidence from a Natural Experiment using High School Students. *Journal of Public Economics*, *94*(7–8), 435–452. <https://doi.org/10.1016/j.jpubeco.2010.04.001>
- Azmat, G., & Iriberry, N. (2016). The Provision of Relative Performance Feedback: An Analysis of Performance and Satisfaction: Relative Performance Feedback. *Journal of Economics & Management Strategy*, *25*(1), 77–110. <https://doi.org/10.1111/jems.12151>
- Beilock, S. L., & Carr, T. H. (2001). On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, *130*(4), 701–725. <https://doi.org/10.1037/0096-3445.130.4.701>
- Berger, L., Fiolleau, K., & MacTavish, C. (2019). I Know Something You Don't Know: The Effect of Relative Performance Information and Individual Performance Incentives on Knowledge Sharing. *Journal of Management Accounting Research*, *31*(2), 19–35. <https://doi.org/10.2308/jmar-52152>
- Black, P. W., Newman, A. H., Stikeleather, B. R., & Waddoups, N. J. (2019). Performance Feedback Type and Employees' Subsequent Willingness to Help Other Employees. *Journal of Management Accounting Research*, *31*(3), 25–39. <https://doi.org/10.2308/jmar-52298>
- Blanes i Vidal, J., & Nossol, M. (2011). Tournaments Without Prizes: Evidence from Personnel Records. *Management Science*, *57*(10), 1721–1736.
- Bolino, M. C., Kacmar, K. M., Turnley, W. H., & Gilstrap, J. B. (2008). A Multi-Level Review of Impression Management Motives and Behaviors. *Journal of Management*, *34*(6), 1080–1109. <https://doi.org/10.1177/0149206308324325>
- Bolino, M., Long, D., & Turnley, W. (2016). Impression Management in Organizations: Critical Questions, Answers, and Areas for Future Research. *Annual Review of Organizational Psychology and Organizational Behavior*, *3*(1), 377–406. <https://doi.org/10.1146/annurev-orgpsych-041015-062337>
- Bozeman, D. P., & Kacmar, K. M. (1997). A Cybernetic Model of Impression Management Processes in Organizations. *Organizational Behavior and Human Decision Processes*, *69*(1), 9–30. <https://doi.org/10.1006/obhd.1996.2669>
- Brown, D. J., Ferris, D. L., Heller, D., & Keeping, L. M. (2007). Antecedents and Consequences of the Frequency of Upward and Downward Social Comparisons at Work. *Organizational*

Behavior and Human Decision Processes, 102(1), 59–75.
<https://doi.org/10.1016/j.obhdp.2006.10.003>

- Campbell, E. M., Liao, H., Chuang, A., Zhou, J., & Dong, Y. (2017). Hot Shots and Cool Reception? An Expanded View of Social Consequences for High Performers. *Journal of Applied Psychology*, 102(5), 845-866.
- Chan, E. W. (2018). Promotion, Relative Performance Information, and the Peter Principle. *The Accounting Review*, 93(3), 83–103. <https://doi.org/10.2308/accr-51890>
- Delfgaauw, J., Dur, R., Non, A., and Verbeke, W. (2014). Dynamic Incentive Effects of Relative Performance Pay: A Field Experiment. *Labour Economics* 28(1): 1-13.
- Eyring, H., Ferguson, P. J., & Koppers, S. (2021). Less Information, More Comparison, and Better Performance: Evidence from a Field Experiment. *Journal of Accounting Research*, 59(2), 657–711. <https://doi.org/10.1111/1475-679X.12362>
- Eyring, H., & Narayanan, V. G. (2018). Performance Effects of Setting a High Reference Point for Peer-Performance Comparison. *Journal of Accounting Research*, 56(2), 581–615. <https://doi.org/10.1111/1475-679X.12199>
- Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, 7, 117–140.
- Fisher, J. G., Maines, L. A., Peffer, S. A., & Sprinkle, G. B. (2002). Using Budgets for Performance Evaluation: Effects of Resource Allocation and Horizontal Information Asymmetry on Budget Proposals, Budget Slack, and Performance. *The Accounting Review*, 77(4), 847–865. <https://doi.org/10.2308/accr.2002.77.4.847>
- Frederickson, J. R. (1992). Relative Performance Information: The Effects of Common Uncertainty and Contract Type on Agent Effort. *The Accounting Review*, 67(4), 647–669.
- Garcia, S. M., & Tor, A. (2007). Rankings, standards, and competition: Task vs. Scale Comparisons. *Organizational Behavior and Human Decision Processes*, 102(1), 95–108. <https://doi.org/10.1016/j.obhdp.2006.10.004>
- Gardner, W. L., & Martinko, M. J. (1988). Impression Management in Organizations. *Journal of Management*, 14(2).
- Giamattei, M., Yahosseini, K. S., Gächter, S., & Molleman, L. (2020). LIONESS Lab: a Free Web-Based Platform for Conducting Interactive Experiments Online. *Journal of the Economic Science Association*. DOI 10.1007/s40881-020-00087-0.
- Gill, D., & Prowse, V. (2019). Measuring Costly Effort Using the Slider Task. *Journal of Behavioral and Experimental Finance*, 21(1–9). <https://doi.org/10.1016/j.jbef.2018.11.003>

- Gilpatric, S. M. (2009). Risk Taking in Contests and the Role of Carrots and Sticks. *Economic Inquiry*, 47(2), 266–277.
- Gilmore, D. C., & Ferris, G. R. (1989). The Effects of Applicant Impression Management Tactics on Interviewer Judgments. *Journal of Management*, 15(4), 557–564.
- Gino, F., & Staats, B. R. (2011). Driven by Social Comparisons: How Feedback about Coworkers' Effort Influences Individual Productivity. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1755051>
- Goethals, G., & Darley, J. (1977). Social Comparison Theory: An Attributional Approach. In *Social Comparison Process: Theoretical and Empirical Perspectives*, edited by J. Suls and R. Miller. Washington, DC: Hemisphere.
- Hannan, R. L., Krishnan, R., & Newman, A. H. (2008). The Effects of Disseminating Relative Performance Feedback in Tournament and Individual Performance Compensation Plans. *The Accounting Review*, 83(4), 893–913. <https://doi.org/10.2308/accr.2008.83.4.893>
- Hannan, R. L., McPhee, G. P., Newman, A. H., Tafkov, I. D., & Kachelmeier, S. J. (2019). The Informativeness of Relative Performance Information and Its Effect on Effort Allocation in a Multitask Environment. *Contemporary Accounting Research*, 36(3), 1607–1633. <https://doi.org/10.1111/1911-3846.12482>
- Hayes, A. F. (2022). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. *New York: Guilford Publications*, 2022. Print.
- He, H. (2021). Silent or Salient? Ability Heterogeneity in Tournaments. *Working Paper*.
- Holderness, D. K., Olsen, K. J., & Thornock, T. A. (2020). Assigned versus Chosen Relative Performance Information: The Effect of Feedback Frequency on Performance. *Journal of Management Accounting Research*, 32(1), 137–158. <https://doi.org/10.2308/jmar-52504>
- Holmstrom, B. (1979). Moral hazard and observability. *The Bell Journal of Economics* 10, 74-91.
- Holmstrom, B. (1982). Moral hazard in teams. *The Bell Journal of Economics* 13, 324-340.
- Kerr, N. L., Messé, L. A., Seok, D.-H., Sambolec, E. J., Lount, R. B., & Park, E. S. (2007). Psychological Mechanisms Underlying the Köhler Motivation Gain. *Personality and Social Psychology Bulletin*, 33(6), 828–841. <https://doi.org/10.1177/0146167207301020>
- Leary, M. R., & Kowalski, R. M. (1990). Impression Management: A Literature Review and Two-Component Model. *IMPRESSION MANAGEMENT*, 14.
- Liden, R. C., & Mitchell, T. R. (1988). Ingratiation Behaviors in Organizational Settings. *Academy of Management Review*, 13(4), 572–587.

- Mas, A., & Moretti, E. (2009). Peers at Work. *American Economic Review*, 99(1), 112–145. <https://doi.org/10.1257/aer.99.1.112>
- Mecham, M., Nathan W. (2019). Who Are You Trying to Impress? A Study of Impression Management and Goal Setting. *Working Paper*.
- Meder M., Plumbaum T., & Hopfgartner F. (2013). Perceived and actual role of gamification principles. In: *Proceedings of the 2013 IEEE/ACM 6th international conference on utility and cloud computing*, pp 488–493.
- Moldovanu, B., & Sela, A. (2001). The Optimal Allocation of Prizes in Contests. *The American Economic Review*, 91(3), 542–558.
- Newman, A. H., & Tafkov, I. D. (2014). Relative Performance Information in Tournaments with Different Prize Structures. *Accounting, Organizations and Society*, 39(5), 348–361. <https://doi.org/10.1016/j.aos.2014.05.004>
- Pleban, R., & Tesser, A. (1981). The Effects of Relevance and Quality and Another's Performance on Interpersonal Closeness. *Social Psychology Quarterly* 44, 278–285.
- Ralston, Dav. A. (1985). Employee Ingratiation: The Role of Management. *Academy of Management Review*, 10(3), 477–487.
- Reeves B., & Read J. L. (2013). Total Engagement: How Games and Virtual Worlds are Changing the Way People Work and Businesses Compete. *Harvard Business Review Press*, Boston.
- Schedlinsky, I., Maximilian, S., & Wohrmann, A. (2020). Interaction of Information and Control Systems: How the Perception of Behavior Control Affects the Motivational Effect of Relative Performance Information. *Accounting, Organizations and Society*, <https://doi.org/10.1016/j.aos.2020.101171>.
- Schnieder, C. (2022). How Relative Performance Information Affects Employee Behavior: A Systematic Review of Empirical Research. *Journal of Accounting Literature*, 44(1), 72 – 107.
- Smith, R. H. (2000). Assimilative and Constrastive Emotional Reactions to Upward and Downward Social Comparisons. In *Handbook of Social Comparison: Theory and Research* (pp. 173–200). Kluwer Academic/Plenum Publishers.
- Suls, J., & Wheeler, L. (2000). *Handbook of Social Comparison: Theory and Research*. Kluwer Academic/Plenum Publishers.
- Tafkov, I. D. (2013). Private and Public Relative Performance Information under Different Compensation Contracts. *The Accounting Review*, 88(1), 327–350. <https://doi.org/10.2308/accr-50292>

- Tesser, A. (1991). Emotion in Social Comparison and Reflection Processes. In *Social Comparison: Contemporary Theory and Research*, edited by J. Suls and T. Wills, 115–145. Hillsdale, NJ: Lawrence Erlbaum.
- Thomas, T. F. and Thornock, T. A. (2022) The Impact of Input Information in the Performance Report on Employee Performance. *Working Paper*.
- Wang, L. W. (2017). Recognizing the Best: The Productive and Counterproductive Effects of Relative Performance Recognition. *Contemporary Accounting Research*, 34(2), 966–990. <https://doi.org/10.1111/1911-3846.12292>
- Wingfield, N. (2012). All the World's a Game, and Business Is a Player. *New York Times*. <https://www.nytimes.com/2012/12/24/technology/all-the-worlds-a-game-and-business-is-a-player.html>
- Yatsenko, D. (2018). Performance Effects of Relative Performance Information and Mutual Monitoring. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3231610>.