Incomplete Incentives, Task Temporality, and Effort Spillover in a Multitask Environment

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

Incomplete incentive contracts in multitask environments present a significant control challenge of ensuring that employees expend sufficient effort towards all assigned tasks, particularly those that are not directly incentivized. Prior research finds that the severity of this agency issue depends on task temporality such that it is less problematic when the tasks are performed concurrently as opposed to sequentially. I extend the literature by examining how incentive type, task temporality, and performance feedback influence effort spillover onto a second, unincentivized task. Specifically, I predict that goal-based incentives and positive performance feedback on an incentivized task will lead to a stronger positive affective response, which will induce greater effort spillover onto an unincentivized task, under sequential multitasking relative to concurrent multitasking. To test my predictions, I employ a 2 x 2 between-subjects experimental design, where I manipulate the type of incentive contract used for the incentivized task between goal-based or piece-rate incentives and task temporality between concurrent or sequential. Participants complete two real-effort tasks where Task 1 performance is incentivized, and Task 2 performance is unincentivized. I examine the impact of my manipulations on participants' affective responses to performance feedback on the incentivized task and their performance on the unincentivized task, which proxies for task effort, as my dependent variables of interest. I find that goal-based incentives under sequential multitasking following goal attainment does lead to greater effort spillover onto an unincentivized task under sequential multitasking compared to concurrent multitasking. Consistent with my theory, I find that positive affect from performance feedback is positively associated with effort spillover onto an unincentivized task. I further predict that goal-based incentives and negative performance feedback on an incentivized task is associated with a stronger negative affective response, which will induce lower effort spillover onto an unincentivized task under sequential multitasking relative to concurrent multitasking. However, I do not find support for the prediction. Specifically, I do not find evidence that negative affect following negative performance feedback is associated with negative effort spillover onto an unincentivized task. The findings from this study highlight the importance of examining how features of the management control system (i.e., incentive type, performance feedback, and job design) can help to address a costly agency problem in multitask environments.

Keywords: affect, effort spillover, incomplete incentive contract, multitasking, performance feedback, task temporality.

JEL classification: C91, M41, M52

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DEDICATION

This thesis is dedicated to my family, especially my partner in life Jordan, my mother Brenda, and my fur children Cooper and Felix. This would not have been possible without your unconditional love and support.

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CHAPTER 1: INTRODUCTION

I investigate the effects of incomplete incentives and performance feedback on effort spillover in a multitask environment, and whether these effects are moderated by how closely in time different tasks are performed (i.e., task temporality). Multitasking is ubiquitous in most modern jobs (Lindbeck and Snower 2000) and while not a new phenomenon, its prevalence has increased following advances in technologies, greater emphasis on teamwork, and growth in managerial and knowledge-based jobs (Alton 2018; González and Mark 2005). Despite their pervasiveness in practice, multitask environments pose a considerable challenge for firms when designing incentive contracts to ensure that employees exercise adequate effort across all the tasks that they are responsible for performing (Holmstrom and Milgrom 1991; Kiesel et al. 2010).

Incentive contracts can be an effective management control tool to address motivational issues by linking compensation to performance outcomes (Bonner et al. 2000). However, one challenge of employing incentive contracts to motivate employee effort is that it is difficult to create a complete contract whereby all important performance outcomes are measured and linked to incentives (Prendergast 1999). The greater the number of tasks that an employee is responsible for, the greater the difficulty in designing a complete contract (Hecht, Tafkov, and Towry 2012, hereafter, HTT). Consequently, organizations typically employ *incomplete incentive contracts* where only a subset of task outcomes are incentivized with performance-based pay (Christ et al. 2016). The remaining tasks are compensated indirectly using fixed pay compensation, which is independent of performance outcomes (Lazear 1986). For example, salespeople frequently receive cash bonuses for reaching individual sales targets, yet are also responsible for administrative tasks, collaborating with other departments to develop customer solutions, attending training to enhance their skills, and coaching new employees, paid by fixed compensation (Zoltners et al. 2012). Despite the prevalent use of incomplete incentive contracts, they can lead to effort allocation issues between the incentivized and unincentivized tasks, even when the unincentivized tasks are important to organizational objectives.

In a seminal study, Holmstrom and Milgrom (1991) demonstrate analytically that incomplete incentive contracts can be problematic by causing employees to direct more effort towards incentivized tasks, and away from unincentivized tasks, in order to maximize their compensation. This can lead to a lack of effort on the unincentivized tasks. Building on Holmstrom and Milgrom (1991), HTT find that given an incomplete incentive contract, task temporality (i.e., concurrent multitasking versus sequential multitasking) can influence the performance outcomes on each task. HTT show that concurrent multitasking between an incentivized and unincentivized task leads to greater unincentivized task performance, relative to sequential multitasking. HTT refer to this as "*the spillover effect*" (HTT: 564).[1]

Concurrent multitasking involves a high degree of temporal overlap between two or more discrete tasks (González and Mark 2005). Concurrent multitasking can occur either due to forced interruptions or planned (i.e., self-initiated) task switching (Skaugset et al. 2015). Research on concurrent multitasking has studied the nature of work for healthcare workers, who frequently switch back and forth between attending to patients (Skaugset et al. 2015). However, concurrent

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[1] HTT use the term *spillover* to describe the increase in performance on an unincentivized second task following an incentivized first task relative to a fixed wage condition. Based on the task they employ for both the incentivized and unincentivized task (i.e., adopted from Sprinkle 2000), HTT analyze both the effort (i.e., number of feedback requests) and task performance (i.e., product profit) on the incentivized task and unincentivized task. They find that incomplete incentives lead to greater effort and performance on the incentivized first task, relative to a fixed compensation contract. This is consistent with Holmstrom and Milgrom (1991). However, under the concurrent multitask setting, they find evidence of a performance spillover effect onto the unincentivized task, which is not due to increased effort on the unincentivized task. They posit that this finding is consistent with activation theory, which is the theory they rely on for their hypotheses. I use the term *effort spillover* because my dependent variable of interest is effort.

multitasking is also required by many other knowledge-based workers, including those in research and development, who are often involved in completing different projects at one time, and switching between individual and team-based tasks (Suija-Markova et al. 2020). Sequential multitasking occurs when one task is started and completed before another begins and thus involves a low degree of temporal overlap between tasks (Adler and Benbunan-Fich 2012). Sequential multitasking can arise when an individual is responsible for completing interdependent tasks (Wong and Campion 1991) or when an individual chooses to work on one task at a time, which may arise in managerial and knowledge-based jobs where individuals have a number of task responsibilities but have discretion in how they carry out those tasks (Alton 2018; González and Mark 2005). For example, a business unit manager may choose to complete a product analysis report before carrying out administrative duties, such as responding to emails.

Prior accounting research studies have examined incomplete incentives in multitask settings (Brüggen 2011; Brüggen and Moers 2007; Christ et al. 2016; Hannan et al. 2013). However, these studies do not examine the effects of task temporality on spillover effects. Although HTT demonstrate the interactive effect of incomplete incentives and task temporality on spillover between tasks, they conclude that their study has only "scratched the surface in terms of understanding the effects of incentives in multitask settings" (HTT: 587). They encourage future research studies to examine the antecedents and consequences of spillover effects in multitask settings. My research extends HTT by examining the role of affective responses as an important antecedent to effort spillover under incomplete incentives. A growing body of research demonstrates that affect can impact subsequent task effort (Crocker et al. 2013; Erez and Isen 2002; Ilies and Judge 2005). Therefore, I examine the interactive effects of incentive contract type and task temporality on affect-induced effort spillover in a multitask setting.

My first prediction examines the effects of two widely used types of incentive contracts, piece-rate and goal-based, on the affective response generated by periodic performance feedback. Piece-rate incentives compensate individuals using a pre-defined rate of pay for each unit of output produced (Bonner et al. 2000). Piece-rate incentives are commonly used in sales settings, with individuals receiving a percentage of sales in the form of commissions (Agranov and Tergiman 2013). Goal-based incentives are often referred to as budget-based or quota incentive schemes because individuals receive a pre-determined fixed compensation amount only if they achieve a certain pre-determined level of performance (Bonner and Sprinkle 2002). Goal-based incentives are also commonly used as evidenced by a 2014 survey, where 75 percent of respondents indicated that their organization employs this type of incentive scheme (WorldatWork and Deloitte Consulting LLP 2014). Psychology research examines how performance feedback influences an individual's affect, broadly defined as the positive or negative emotions and moods that one experiences (Fiske and Tayler 1991).[2] When individuals self-evaluate their performance, Carver and Scheier (2000) assert that a standard or referent value is necessary to induce affective responses to performance outcomes; performance goals provide a clear referent for this process. For example, studies find that achieving (failing to achieve) a performance goal induces positive (negative) affective responses (Davis and Yates 1982; Simon 1979). In contrast, piece-rate incentives do not provide an explicit performance standard, and are therefore less likely to induce strong affective responses to performance

[2] Following, Kida et al. (2001: 491) emotions refer to affective "reactions toward a specific target", while moods are "general positive or negative affective states" that individuals bring to a task and are not typically a reaction toward a specific object or individual. Therefore, the focus of this study is to examine emotions caused by performance feedback as opposed to individual mood states.

feedback (Kluger et al. 1994; Locke and Latham 1990a). Therefore, I predict (H1) performance feedback for a task under goal-based incentives will yield a stronger total affective (i.e., total positive affect and negative affect) response than under piece-rate incentives.

Second, I examine the role of task temporality in moderating the effects of incentive contract type on the affective response to performance feedback. Research shows that individuals experience discrete, intense emotions following goal achievement or failure, while more general, less intense emotions are experienced during feedback on goal progress (Fishbach et al. 2010). Under goal-based incentives, completing an incentivized task before beginning an unincentivized task in sequential multitasking, allows for performance feedback about goal achievement or failure. I expect feedback about goal attainment, or failure to attain a goal, in sequential multitasking will lead to a stronger total affective response than feedback about goal progress in concurrent multitasking. Under piece-rate incentives, I do not expect differences in affective responses between concurrent and sequential multitasking because piece-rate incentives are not contingent upon achievement of a specific performance level. Accordingly, I predict (H2) that the positive effect of goal-based versus piece-rate incentives on employees' total affective responses to performance feedback will be stronger in sequential multitasking than in concurrent multitasking.

Finally, I examine how the predicted effects of incentive contract type and task temporality on the strength of affective responses to performance feedback, will impact effort spillover to an unincentivized task. Prior research suggests that affective responses to performance feedback indicating goal attainment or failure on one task can influence effort on another task. Specifically, positive (negative) affect in response to goal attainment (failure) leads to greater (less) effort on a subsequent task (Kluger and DeNisi 1996; Quintela 2005; Quintela and Donovan 2008). Based on this literature and my first two predictions, my final two hypotheses are that effort spillover to the unincentivized task will be: (H3a) *highest* following positive performance feedback on the incentivized task when goal-based incentives are present in sequential multitasking, relative to when goal-based incentives are present in concurrent multitasking, or when piece-rate incentives are present in concurrent or sequential multitasking; and (H3b) *lowest* following negative performance feedback on the incentivized task when goal-based incentives are present in sequential multitasking, relative to when goal-based incentives are present in concurrent multitasking, or when piece-rate incentives are present in concurrent or sequential multitasking.

I employ a 2 x 2 between-participant experimental design to test my hypotheses. I recruit participants from the online labour market Amazon Mechanical Turk (MTurk) as they are suitable proxies for non-expert workers (Farrell et al. 2017). I manipulate incentive contract type, piece-rate versus goal-based incentives; and task temporality, concurrent versus sequential multitasking. All participants perform two distinct real-effort tasks that are highly sensitive to effort.[3] In concurrent multitasking, participants alternate between completing both tasks, while in the sequential multitasking condition, participants complete one task before beginning the second task. In all conditions, the second task is unincentivized. Participants are randomly assigned to one of four conditions that employ either piece-rate incentives or goal-based incentives for the incentivized task, where the incentivized and unincentivized tasks are performed either concurrently or sequentially: (1) piece-rate incentive with concurrent multitasking, (2) piece-rate incentive with sequential multitasking, (3) goal-based incentive with concurrent multitasking, (4) goal-based incentive with sequential multitasking. I examine the impact of my manipulations on

[3] Real-effort tasks focus on measuring effort intensity defined as "the amount of attention an individual devotes to a task or activity during a fixed period of time" (Bonner and Sprinkle 2002: 306).

participants' affective responses to performance feedback on the incentivized task (H1 and H2) and their performance on the unincentivized task (H3a/H3b), which proxies for task effort, as my dependent variables of interest. Performance feedback is a partially endogenous independent variable because it is based on the incentive contract type and performance on the incentivized task.[4] I measure participants' affective responses to performance feedback based on positive affect, negative affect, and total affect, by combining measures of positive affect and negative affect, to determine the total strength of affective responses between the conditions.[5] I expect that participants' affective responses to performance feedback will mediate the relationship between the condition and the unincentivized task performance.

Consistent with my first prediction, I find that individuals assigned to the goal-based incentive conditions experience greater total affective reactions to performance feedback compared to individuals assigned to the piece-rate incentive conditions. Supplemental analyses reveal that this result is due to greater negative affect experienced by those working under goal-based incentives who fail to attain the goal, and not from greater positive affect for those who do attain the goal.

Consistent with my second prediction, I find that individuals working under piece-rate incentives do not experience any difference in positive affect or negative affect following performance feedback between concurrent and sequential multitasking. Inconsistent with expectations, I do not find a significant difference in the total affective reactions to performance feedback of goal-based incentives under sequential multitasking versus concurrent multitasking.

[4] Performance feedback occurs based on three types: participants in the *Goal* condition nested in terms of goal attainment (i.e., for those who attain versus for those who do not attain the assigned goal), and in the absence of a goal for those in the *Piece-rate* condition.
[5] I measure total affect by combining scores from a positive affect measure and negative affect measure based on the Positive Affect Negative Affect Schedule (hereafter, PANAS) developed by Watson et al. (1988). The PANAS is discussed in detail in Chapter 2.

Supplemental analyses reveal that individuals working under goal-based incentives who do not attain the goal experience greater negative affect, and no difference in positive affective, when they receive performance feedback under sequential multitasking relative to concurrent multitasking. For individuals who attain the goal, sequential multitasking does not lead to greater positive affect following performance feedback, but does lead to lower negative affect, relative to those working under concurrent multitasking. Thus, I find some evidence that task temporality does impact the affective reactions of those working under goal-based incentives, but does not impact affect for those working under piece-rate incentives.

Finally, consistent with H3a I find that individuals working under sequential multitasking and goal-based incentives who attain the Task 1 goal have the greatest performance on the second, unincentivized task, relative to the other conditions. Contrary to H3b, I do not find evidence that individuals working under sequential multitasking and goal-based incentives who fail to attain the performance goal on Task 1 have the lowest performance on the second unincentivized task, relative to the other conditions. Based on a supplemental path analysis, I find that positive affect is associated with greater effort spillover onto the unincentivized task. I also find a direct, positive association for those who attain the goal under sequential multitasking and effort spillover effects onto the second task. However, I do not find evidence that the greater effort spillover for those working under goal-based incentives who attain the Task 1 performance goal and are engaging in sequential multitasking is due to greater positive affect relative to those working under piece-rate incentives. Inconsistent with prior studies, I do not detect a significant negative association between negative affect and effort spillover (Carver et al. 1979; Hiroto and Seligman 1975; Krantz et al. Snyder 1974; Quintela 2005).

Taken together, the results suggest that the increase in negative affect experienced by those working under goal-based incentives has no negative overall impact on effort spillover, while the positive feedback following goal attainment leads to greater effort spillover effects compared to piece-rate incentives. Thus, under sequential multitasking, goal-based incentives are more likely to lead to greater positive effort spillover relative to piece-rate incentives. Based on the results of my supplemental analyses and the supplemental path analysis, I conclude that when tasks are performed concurrently, it is more beneficial to employ piece-rate incentives to maximize the positive effort spillover effect from positive affect.

My research contributes to both theory and practice in at least three substantive ways. First, my study contributes to the extant accounting literature examining multitask settings (Burkert and Grossrieder 2020; Brüggen 2011; Brüggen and Moers 2007; Christ et al. 2016; Hannan et al. 2013; HTT). Both incentives and performance feedback are prevalent management controls used in organizations, and my study provides a better understanding of how these controls influence effort spillover in a multitask environment (Merchant and Van der Stede 2017). The findings from HTT suggest that incomplete incentives may be more effective when the tasks are performed in close temporality.[6] However, there are many settings where an individual chooses to perform tasks sequentially, and also settings where tasks cannot be performed concurrently, such as when one person is responsible for completing interdependent tasks (Wong and Campion 1991). My study extends HTT and the existing literature on multitask settings, by examining how management control choices can have important spillover effects. By comparing piece-rate and goal-based incentives, my findings suggest that under concurrent

[6] Burkert and Grossrieder (2020) build on HTT by examining performance spillover effects from incentivizing a routine task onto a non-routine task. Consistent with HTT, they find that positive performance spillover occurs only when the tasks are performed concurrently and when individuals find the routine task interesting, but not when the tasks are performed sequentially and/or when individuals find the routine task uninteresting.

multitasking, piece-rate incentives are more likely to lead to increase effort spillover effects relative to goal-based incentives due to the increased positive affect and lower negative affect. However, under sequential multitasking, the greater effort spillover effects from goal-based incentives following goal attainment appear to outweigh any potential downsides from goal failure.

Second, I contribute to the extant accounting literature examining goal-based incentives (e.g., Anderson et al. 2010; Murphy 2000; Bonner et al. 2000). While the literature has examined many facets of goal-based incentives, I am unaware of any research in accounting that examines the implications of employing goal-based incentives in multitask settings. From a practical standpoint, my study is important to firms because it examines whether task temporality has a moderating effect on how incentives and performance feedback induce effort spillover. My findings suggest that it is important for organizations to consider which incentive type is best to employ, based on how the multiple tasks are carried out, to improve performance on both the incentivized and unincentivized tasks.

Third, I contribute to a better understanding of the important yet understudied role of affect on motivation. Traditional theories of motivation focus primarily on cognitive processes, rather than the impact of emotion, but more recently the literature has highlighted the importance of studying affect to better understand motivational processes (Ilies and Judge 2005; Pintrich and Schunk 2002). My study contributes to these existing theories by highlighting the need to consider how affective responses to performance feedback on one task may spillover to influence the effort exerted on other tasks. Specifically, my study is the first of which I am aware to document how feedback about goal attainment under goal-based incentives can generate sufficient positive affect to induce effort spillover effects that are strong enough to persist in sequential multitask settings relative to concurrent multitask settings. In contrast, prior accounting studies find that spillover effects are greater under concurrent multitask settings relative sequential settings (e.g., Burkert and Grossrieder 2020; HTT).

The next chapter provides a review of the incentives literature, the feedback literature, the affect literature and the performance spillover literature. Chapter 3 develops my research setting of interest and my hypotheses. Chapter 4 describes my pilot experiment and results. Chapter 5 describes my main experimental method that I employ to test my hypotheses. Chapter 6 discusses the results of my main experiment and tests my hypotheses. Chapter 7 discusses the limitations and implications of my study and provides concluding remarks.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter, I use the existing accounting and psychology literatures to examine the relationships among incentives, performance feedback, affect, and performance spillover.[7] This chapter is organized as follows. In section 2.2, I provide a broad overview of two incentive schemes commonly employed in organizations, piece-rate and goal-based incentives. I also discuss the role that goals play in linking incentives to performance outcomes, as an important component of goal-based incentives. In section 2.3, I define a second common management control, performance feedback, as a construct. In section 2.4, I introduce affect as a construct, and I explain how performance feedback leads to changes in an individual's affective state. In section 2.5, I review literature to understand the impact of affect on both cognitive and motivational processes. I then summarize prominent psychology theories that explain the mediating role of affect in the relationship between performance feedback and effort. In section 2.6, I provide an overview of the literature that has examined effort spillover and discuss its relationship with performance feedback and affect. I conclude this chapter in section 2.7.

2.2 The Motivational Effect of Incentives and Goals

In this section, I define financial incentives and focus on the two most common incentive schemes used in practice, piece-rate and goal-based incentives, to increase effort. I also define performance goals, as a key component in goal-based incentives, and describe the necessary conditions for goals to be effective drivers of effort.

[7] Content from the literature review in this chapter, as well as the pilot study in Chapter 4 of this dissertation, is included in Lane (2021).

2.2.1 An Overview of Incentives

Management accounting plays a fundamental role in the design of compensation practices and in determining how compensation influences performance outcomes (Atkinson et al. 1997; Merchant and Van der Stede 2017). Broadly speaking, a financial incentive is "an extrinsic motivator in which pay is linked to performance" (Bonner et al. 2000: 26). Financial incentives serve as an important and prevalent results control in practice, by linking rewards to specific performance outcomes (Merchant and Van der Stede 2017). Financial incentives create a two-stage process, whereby they induce the exertion of greater effort, and the greater effort then leads to increased performance outcomes, assuming that performance is sensitive to effort (Bonner and Sprinkle 2002).[8] Despite the basic premise that financial incentives can increase performance by inducing greater effort, there is evidence that different incentive contract types vary in their effectiveness (Bonner et al. 2000; Chow 1983).[9]

Using a cross-classification analysis of 131 extant cross-discipline experimental studies, Bonner et al. (2000) determine that goal-based incentives and piece-rate incentives are among the most effective incentive contracts in inducing effort on tasks, relative to flat-wage, tournaments, and variable ratio incentives.[10] They posit that this result is because goal-based and piece-rate incentives most directly link pay to performance outcomes. Piece-rate incentives compensate individuals using a pre-defined rate of pay for each unit of output produced (Bonner et al. 2000). According to Bonner and Sprinkle (2002), goal-based incentives are often referred

[8] Effort directed toward current performance of a task is posited to lead to immediate increases in performance. If effort is directed toward learning instead of current performance, the effort is expected to lead to delayed increases in performance (Bonner and Sprinkle 2002).
[9] Incentives are used to address three management control problems: lack of motivation, lack of direction, and personal limitations (Merchant and Van der Stede 2017). The focus of my study is on the lack of motivation issue.
[10] Variable-ratio incentives occur when individuals are rewarded only some of the time versus 100 percent of the time that a pre-determined performance level is achieved (Bonner et al. 2000).

to as budget-based or quota incentive schemes because individuals receive a pre-determined fixed compensation amount only if they achieve a certain pre-determined level of performance (Bonner and Sprinkle 2002). Above the pre-determined performance level, individuals sometimes receive piece-rate incentives for every additional unit of output (Bonner et al. 2000). Based on their literature review and cross-classification analysis, Bonner et al. (2000) conclude that goal-based incentives have the highest likelihood of leading to positive incentive effects on performance, relative to all other incentive types, because the presence of a challenging (but achievable) goal induces greater effort. In the next subsection, I define goals as a construct and necessary component of goal-based incentives.

2.2.2 An Overview of Goals

A key characteristic of goal-based incentives is the presence of a specific, performance goal that must be attained to earn the incentive. Performance goals (hereafter, goals) are one of the most pervasive management control mechanisms employed by firms to communicate expectations and increase employee effort (Libby et al. 2019).[11] Goals enable organizations to direct, regulate, coordinate, and monitor activities to ensure that desired outcomes are attained (Otley and Berry 1981). A goal typically refers to "a specific standard of proficiency on a task within a specified period of time" (Locke et al. 1981: 126). Goals vary in difficulty from easy to impossible to achieve.[12] Goals are employed both formally when they are tied to compensation, and informally to communicate organizational objectives and expectations (Christ et al. 2012;

[11] The focus of my study is on performance goals, which focus on a particular performance outcome to be obtained, assuming that the individual can employ the appropriate skills and strategies to carry out the task. In contrast, learning goals focus on encouraging an individual to discover strategies or processes to carry out a task more effectively (Latham and Locke 2007).
[12] Goal difficulty differs from task difficulty, which refers to a task that is hard to do because of the "high level of skill and knowledge" or effort that it requires (Locke et al 1981: 126). The positive relationship between goals and task performance may not occur when there is high task difficulty because of the moderating effects of ability and knowledge (Locke et al. 1981).

Fatseas and Hirst 1992; Henri 2006; Libby et al. 2019; Newman 2014; Merchant and Van der Stede 2017). Goals may either be assigned by a superior, self-selected by the employee, or set participatively (Latham and Locke 2007).

Goal-setting theory is a theory of motivation that links the use of goals to task performance (Locke and Latham 2002). It is regarded as an "open theory built on inductive findings from empirical research" (Latham and Locke 2007: 290). According to goal-setting theory, a goal must be both specific and appropriately difficult to positively affect performance (Latham and Locke 1991). First, a goal must be specific, such that it provides an external reference for the level of performance to be achieved (Locke and Latham 2002). Locke and Latham (1990a) find that specific goals consistently lead to higher performance relative to encouraging individuals simply to try their best at a task. Second, a goal must be difficult enough to require sustained effort to achieve the goal within the limits of one's ability (Latham and Locke 1991; Locke and Latham 2002). Linking incentives to goal attainment can help to increase commitment to goal attainment, thereby increasing the positive effect of goals on performance (Locke and Latham 2002).

Research shows that when goal-based incentives are employed, moderately difficult goals lead to greater sustained effort, and subsequently produce higher performance outcomes, relative to very easy goals, very difficult (i.e., stretch) goals, or no goals (Bonner and Sprinkle 2002; Erez et al. 1990; Fatseas and Hirst 1992; Locke and Latham 2002).[13] When employing goal-

[13] Goal difficulty is also associated with differences in goal commitment, which refers to "one's attachment or determination to a goal" (Locke et al. 1988, 24). Goal commitment is a key element of goal-setting theory, since without commitment to goal attainment, the presence of a goal is unlikely to induce increased effort (Locke 1968). Moderately challenging goals are associated with greater goal commitment, compared to very difficult and very easy goals (Locke et al. 1988). Following Presslee et al. (2013: 1811), two primary determinants of goal commitment include: "expectancy, the perceived likelihood of achieving a goal (Hollenbeck et al. 1989); and goal attractiveness, "the anticipated satisfaction from goal attainment (Klein 1991: 238)."

based incentives, assigning a goal that is too difficult leads to decrements in performance, while moderately difficult goals lead to increases in performance (Lee et al. 1997; Locke and Latham 2002). For example, Lee et al. (1997) find that under goal-based incentives, task performance is greatest under a moderate goal, compared to an easy goal, and a very difficult goal (probability of attainment = 10%).[14] They also find that under goal-based incentives, performance deteriorates under very difficult goals relative to performance under moderate goals. Lee et al. (1997) determine that the results are mediated by personal goals and self-efficacy.[15] When an individual's compensation is tied to goal achievement, people will subsequently lower their personal goals and self-efficacy when they do not expect to attain the goal, to increase the likelihood of receiving incentive compensation (Locke and Latham 2002).[16] Consistently, Bonner and Sprinkle (2002) conclude that under goal-based incentives, performance increases as goal difficulty increases, but then decreases once goals become too difficult. In contrast, under piece-rate incentives, goal-setting theory predicts a positive linear relationship between goal difficulty and performance (Bonner and Sprinkle 2002).

An important component of employing goals is the provision of feedback indicating goal attainment or failure, which influences subsequent effort (Campion and Lord 1982; Locke et al. 1981; Otley and Berry 1981). Prior studies show that the positive effects of moderately difficult goals on performance only occur when frequent performance feedback is provided (e.g., Becker 1978; Erez 1977; Hirst and Lowy 1990; Strang et al. 1978). For example, Strang et al, (1978) find that when working towards challenging goals, participants completing arithmetic problems

[14] Lee et al. (1997) operationalize an easy goal with a probability of attainment at 90%; a moderate goal with a probability of attainment at 50%; and a difficult goal with a probability of attainment at 10%.
[15] Self-efficacy refers to "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situation demands" (Wood and Bandura 1989: 408).
[16] Other studies show that incentive effects on performance are accounted for by instrumentality (i.e., outcome expectancies) rather than personal goals and self-efficacy (e.g., Wood et al. 1999).

increase their effort intensity without increasing the number of computational errors made only when they are also given performance feedback.

2.3 The Motivational Effect of Performance Feedback

In this section, I define performance feedback and describe the importance of performance feedback when employing incentives and goals to increase subsequent effort. Performance feedback is a central construct to my research.

2.3.1 An Overview of Performance Feedback

In addition to assigned goals and incentive contracts, the delivery of performance feedback is considered a central management control used to improve employee effort (Anthony and Govindarajan 2007; Balcazar et al. 1985; Buchheit et al. 2012; Hannan et al. 2008; Luckett and Eggleton 1991; Latham and Locke 2007). Performance feedback broadly refers to information provided to an individual about the "quality and/or quantity of their performance" (Prue and Fairbank 1981: 1).[17] According to Otley and Berry (1980: 236), control can only occur "when knowledge of outcomes is available; with no feedback on actual performance, improvement (and even continued success in changing conditions) is possible only by chance."[18] Feedback's effect on subsequent effort depends on how the information is evaluated by the

[17] Buchheit et al (2012: 2) distinguish between outcome feedback (i.e., "feedback with quantified outcomes that generally have intuitive directional properties," such as more output is better) and explanatory feedback (i.e., "step-by-step feedback regarding why a particular event occurred"). For my study, I focus on outcome feedback and refer to it as performance feedback.

[18] Management accounting traditionally relies on cybernetic control theory to explain how feedback works (Luckett and Eggleton 1991; Otley and Berry 1981). Cybernetic control theory relies on the feedback loop, consisting of four elements: 1) an input function, 2) a reference value, 3) a comparison process, and 4) an output (i.e., the response to the comparison between the input and the reference value) (Carver and Scheier 2012).

recipient and the decisions that are made as a result of the information (Latham and Locke 1991).[19]

2.3.2 Performance Feedback and Incentives

Prior accounting research suggests that both performance feedback and incentive compensation are necessary to improve subsequent performance (Buchheit et al. 2012; Bryant et al. 2009; Coletti et al. 2005; Drake et al. 2007; Libby and Thorne 2009; Sprinkle 2000, 2003). For example, Sprinkle (2000) demonstrates that relative to fixed wage contracts, incentive compensation helps to motivate individuals to both acquire and use feedback to improve task performance over time. This finding is consistent with the basic notion that incentives lead to greater effort (Bonner and Sprinkle 2002). Therefore, the presence of incentives can encourage individuals to put more effort into acquiring and using feedback information to improve their subsequent task performance (Locke and Latham 1990a).

2.3.3 Performance Feedback and Goals

A second component required for feedback to be effective is to have an outcome objective or goal to compare against actual performance (Otley and Berry 1981). According to Bandura and Cervone (1986), goals help provide information against which to evaluate actual performance, thus increasing the value and impact of performance feedback. This evaluation process allows for a subsequent action to be chosen and implemented (Otley and Berry 1981). Therefore, goal-based incentives, in contrast with traditional piece-rate incentives, provide a specific objective or standard to evaluate actual performance against. Based on a review of

[19] For instance, the nature of feedback, i.e., the feedback source (e.g., a peer versus a superior), feedback frequency, the feedback content (or information value), and whether it serves to motivate future behaviours, or reinforce or punish existing behaviours can all vary across settings. Such variations explain why results observed in prior research are unlikely to be consistent (Ilgen et al. 1979).

experimental studies, Locke et al. (1981) argue that performance feedback alone is not sufficient to lead to performance improvements. The evaluation of actual performance relative to a goal influences feedback valence, which refers to the perceived favourableness of the information conveyed through the feedback message (Cusella 1982). Positive feedback contains information that is favourable and indicates one's performance is satisfactory or improved, while negative feedback contains information that is unfavourable, suggesting one's performance is not acceptable (Cusella 1982). Goals can help increase performance feedback valence, by permitting a comparison and evaluation of actual performance relative to the goal as being either good or bad (Locke and Latham 1990a). Evidence shows that feedback about performance relative to a goal can induce affective responses, such that feedback indicating goal attainment leads to positive affect and goal failure leads to negative affect (Alliger and Williams 1993; Ilies and Judge 2005; Kluger and DeNisi 1996).[20]

2.4 An Overview of Affect

In this section, I define and discuss affect as a construct. I also describe how affect is measured in the literature, and how affect is an important consequence of performance feedback.

2.4.1 Defining the Construct of Affect

Affect refers to the neurophysiological states or feelings that humans consciously experience (Russell 2003). Affect can encompass both emotions, which are more intense, short-lived internal feelings directed towards something or someone, and moods, which are less-intense, pervasive, general states that have no specific cause or target associated with them

[20] Motivational theorists argue that feedback indicating progress towards a goal lead to similar affective reactions, such that feedback indicating that sufficient (insufficient) progress has been made induces positive affect (negative affect) (Carver and Scheier 2012; Kluger and DeNisi 1996).

(Ekkekakis 2012).[21] Because emotions occur in response to a person, object, or event, they are described as richer in valence and complexity, relative to moods, which do not have a specific external cause and are often described in vague terms, such as "good, bad or neutral moods" (Bonner 2008: 90).

Affect has been characterised as a bi-dimensional construct, consisting of both valence (i.e., pleasantness) and activation strength (i.e., energization) (Barrett and Russell 1999; Gable and Harmon-Jones 2010).[22] While there is no consensus on the underlying structure of affect, Watson et al.'s (1988) framework known as the PANAS is predominantly used in psychology and organizational sciences (Kaplan et al. 2009). The PANAS has also been used in accounting studies examining affect (e.g., Blay et al. 2019; Blay et al. 2012; Johnson et al. 2016; Loftus and Tanlu 2016). For example, Loftus and Tanlu (2016) employ the PANAS in their experimental study to measure participants' emotional reactions to feedback messages that manipulate the use of causal language and feedback valence. The following subsection will describe how affect is measured in the literature using the PANAS.

2.4.2 Measuring Affect

The PANAS structures the concept of affect using two unipolar factors, positive affect and negative affect, that are primarily independent of one another, such that an individual may experience both positive and negative affect simultaneously (Isen and Baron 1991; Kaplan et al. 2009; Lan et al. 2021; Watson and Tellegen 1985). Research provides support that the two

[21] In this dissertation, I use the term affect, which is often used interchangeably with emotion in the literature (Gross 1998).

[22] The structural dimensions of affect have been defined differently in the literature. For instance, Thayer (1967, 1978) defines affect based on energy and tension, Larsen and Diener (1992) define affect based on activation and pleasantness, and Watson et al. (1999) differentiate between high positive affect and high negative affect. Yik et al. (1999) attempt to integrate these different conceptualizations into one circumplex model of affect. However, the two central dimensions of their model include valence and energy.

factors are independent, with each factor associated with different biological and behavioural systems (Burke et al. 1993; Cacioppo et al. 1999; Frederickson 2001). For example, positive affect is generally associated with approach behaviour, while negative affect is associated with withdrawal behaviour (Cacioppo et al. 1999; Frederickson 2001; Lan et al. 2021). The PANAS measures of positive affect and negative affect are characterized as high or low based on the level of activation of positive and negative valanced affects, respectively (Watson et al. 1988; Watson et al. 1999).[23] Positive affective states that are defined as high in energization or motivational intensity include enthusiasm, alertness, and excitement, while low positive affect includes feelings of dullness and lethargy (Watson et al. 1999). High negative affect refers to the extent to which an individual experiences negative valence and includes aversive states, such as "anger, contempt, disgust, guilt, fear, and nervousness" (Watson et al. 1988: 1063). Low negative affective states include calmness and serenity (Kaplan et al. 2009). The next subsection discusses the role that performance feedback has on impacting an individual's affective state.

2.4.3 The Relationship between Performance Feedback and Affect

Accounting research has recently begun to consider the important role that affect plays in accounting practices (Repenning et al. 2021). Management controls, including the use of goals and performance feedback, create strong emotional responses because they are used to establish specific performance standards and evaluate employee performance (Hall 2016). Performance feedback valence can be expressed through the wording used by an external feedback source (e.g., good job!) and/or more specifically by indicating whether one's actual performance meets or falls short of an expected standard (Geddes and Linnehan 1996; Carver and Scheier 1990).

[23] Watson et al. (1999) propose renaming the positive affect and negative affect factors in the Watson et al. (1988) model to positive activation and negative activation because each factor is characterized based on the degree of activation, where high activation better captures the true qualities of each factor.

Carver and Scheier (1990) examine how affect arises using a control theory perspective, which suggests that individuals engage in feedback-based processes to self-regulate their actions and behaviours.[24] Carver and Scheier (1990) believe that all behaviour is goal-directed and that affective reactions are a consequence of comparing expected rate of progress towards (or attainment of) a goal to their actual or perceived progress (or goal attainment). That is, affect occurs in response to the feedback about one's performance relative to a goal (Carver and Scheier 2000). Assuming that the goal is desirable to attain (i.e., an approach goal), discrepancies between expected and actual performance or perceived progress lead to predictable affective reactions (Carver and Scheier 1990).[25] Negative discrepancies where actual performance falls below expected performance outcomes result in negative affective reactions, and positive discrepancies where actual performance exceeds expected performance outcomes lead to positive affective reactions (Carver et al. 1996). Accordingly, research shows that those who attain a performance standard, such as an assigned goal, experience positive affect (e.g., pride, happiness), while those who fail to attain a performance standard experience negative affect (e.g., frustration, disappointment, guilt) (Davis and Yates 1982; Isen 2000; Kernan and Lord 1991; Koestner et al. (2002); Lerner and Keltner 2001; Quintela 2005; Simon 1979).

Overall, research in management, accounting, and psychology suggests that affective reactions occur in response to feedback about one's own performance relative to a goal, such that goal achievement induces positive affective reactions and goal failure results in negative

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[24] Locke et al. (2018) distinguish control theory from goal theory. While goal theory has an approach focus, control theory has an avoid focus. Goal theory argues that people set goals for future performance, while control theory states that people endeavor to avoid discrepancy between their current performance and a goal (Locke et al. 2018).

[25] Carver and Scheier (2012) distinguish between approach and avoidance goals, such that under approach goals individuals try to decrease the gap between their outcomes and the goal, and under avoidance goals individuals try to increase the gap between their outcomes and the goals. They argue that both positive and negative affect can occur under approach and avoidance goals. Approach-related positive affect includes, elation or excitement, and approach-related negative affect includes, anger, frustration, or sadness. Avoidance-related positive affect includes contentment, and avoidance-related negative affect includes, guilt, or anxiety (Carver and Scheier, 2012).

affective reactions (Carver and Scheier 1990, 2012). These affective reactions can then influence the amount of effort exerted on tasks (Erez and Isen 2002; Isen and Reeve 2005; Seo et al. 2004).

2.5 The Impact of Affect on Cognitive and Motivational Processes

Over the past three decades, research studies in psychology and neuroscience provide evidence that affect can impact performance outcomes through its influence on cognitive and/or motivational processes, which are distinct but interrelated (Chiew and Braver 2011; Crocker et al. 2013; Isen 2003; Linnenbrink 2006; Pekrun 1992).[26] Both cognitive and motivational processes can impact performance outcomes (Dowson and McInerny 1997) since performance is typically a function of an individual's ability, knowledge, and the amount of effort put forth on a given task (Libby and Luft 1993).[27] Cognitive processes impact the ability and knowledge component of performance, while motivational processes impact the effort component of performance (Bonner and Sprinkle 2002; Erez and Isen 2002). Specifically, cognitive processes explain how individuals acquire, evaluate and process information, and motivational processes regulate the amount of energy available to carry out tasks (Erez and Isen 2002). In the following subsection, I review the literature that examines the impact of affect on cognitive processes.

2.5.1 The Impact of Affect on Cognitive Processes

A large body of research has focused on providing an understanding of the relationship between affect and cognitive processes (see Bonner (2008); Forgas (2001); and Isen (2000, 2008) for reviews of the effects of affect on cognitive processes). Cognitive processes refer to the mental processes by which "knowledge is acquired and understood through thought, experience,

[26] There are inconsistent views as to the exact relationship between affect, cognition, and motivation (Crocker et al. 2013; Linnenbrink 2006). While some theorists believe that they make up three different and separable components that influence behaviour (Berridge et al. 2009; Chiew and Braver 2011; Pekrun 1992), others argue that the three constructs are inseparable (Forgas 2000; Laming, 2000; Meyer and Turner 2006; Pessoa 2019).
[27] Bonner and Sprinkle (2002: 313) use the term "skill" to refer to both ability and knowledge.

and the senses" (Huang et al. 2017: 506). Research shows that affect can influence a number of cognitive processes including, the use of heuristics and stereotypes (Bodenhausen et al. 1994; Ruder and Bless 2003; Schwarz 2002; Slovic et al. 2007), creative thinking (Baas et al. 2008; Hirt et al. 1996), and information retrieval (Bower and Forgas 2001; Schwarz and Clore 2003; Sinclair 1988). For example, psychology studies find that positive affect leads to greater creativity and cognitive flexibility relative to negative or neutral affective states (Chiew and Braver 2011).[28] Because affect is so pervasive in the human condition, Isen (2008) argues that affect should be thought of as having profound rather than an infrequent influence on cognitive processes.

Accounting research has examined the relationship between affect and cognitive processes to provide a better understanding the judgment and decision-making of individuals, including managers, investors, auditors (Bonner 2008). For example, Kida et al. (2001) and Moreno et al. (2002) examine how managers' affective reactions can influence their capital-budgeting decisions. Farrell et al. (2014) find that managers make less desirable investment choices when they are experiencing either positive or negative affective reactions because it leads them to rely more on automatic affective-based heuristics rather than analytical and deliberate cognitive processing. However, few accounting studies have examined the impact of affect on motivational processes associated with changes in effort. In the next subsection, I review the psychology literature that examines the impact that affect has on motivational processes.

[28] Cognitive flexibility refers to the "ability to structure one's own knowledge in a variety of ways in adaptation to changing situational demands" (Stahl 2011: 39).

2.5.2 The Impact of Affect on Motivational Processes

A growing body of research has focused on understanding the relationship between affect and the motivational processes leading to greater task effort and subsequently greater task performance (Crocker et al. 2013; Erez and Isen 2002). Affect and motivation are related constructs that encompass a hedonic (i.e., subjective experiences of pleasure or displeasure) and energization component (Chiew and Braver 2011). However, motivation is more closely linked to goal-directed action (Roseman 2008).

Motivational processes are comprised of both non-directional, activation or energization (related to effort duration and intensity), and directional motivational functions related to effort direction (Salamone and Correa 2012). [29] Directional motivational functions are described as the "drive goal-directed behaviours aimed at achieving desired outcomes and avoiding undesirable ones" (Crocker et al. 2013: 1) or "what makes one work to obtain a reward or to avoid punishment" (Pessoa 2009: 160). In contrast, affect is the response to one's perceived rate of progress towards or attainment of a goal (Carver 2006).

Affect can directly influence motivational processes because it inherently leads to changes in arousal or energization (Bradley 2000). Affect high in energization causes individuals to exert greater effort, regardless of its valence, to attain or a avoid a particular outcome, either consciously or unconsciously (Brehm 1999). In addition, affect valence can also directly influence motivation, such that individuals experiencing positive affect are more likely to be motivated to behave in ways that maintain their current affective state, while those experiencing

[29] Motivational processes also include both conscious and unconscious (automatic) processes that influence perceptions and behaviours (Levesque et al. 2008).

negative affect are more motivated to behave in ways that reduce their current affective state, without requiring consciousness (Forgas 1995; Isen 2000).

Recent theoretical and empirical studies in the management and psychology literature provide evidence that affective states can indirectly influence motivational processes by changing the perceptions of the motivational properties of the task and performance outcomes (Gray 1981, 1990; Kluger and DeNisi 1996; Erez and Isen 2002; Isen and Reeve 2005; Seo et al. 2004, 2010).[30] These studies highlight that affect is an important source of influence on motivational processes and human behaviour (Seo et al. 2004). Below, I review two prominent theories that explain the mediating role of affect in the relationship between performance feedback and effort.

2.5.3 Theories on Affect as a Mediator of the Effects of Feedback on Effort

Theories that consider the affective consequences of feedback are important because the behaviours that are elicited to cope with one's affective state take priority over other behaviours (Belschak and Den Hartog 2009).

One of the most fundamental theories to suggest a mediating role of affect in the study of goals is Gray's behavioral theory of motivation (1981, 1990), which postulates that two distinct neural systems regulate affective responses to feedback and subsequently influence the type of behavioural motivation that follows.[31] First, the behavioural activation system (BAS) is the appetitive or positive hedonic motivational system, responsible for regulating positive affect (Fowles 1987). The second system called the behavioural inhibition system (BIS) is referred to

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[30] The theoretical models examining the influence of affect on motivational processes consider both the direct influence of affect on motivational processes and the indirect influence of affect on cognitive processes underlying motivational processes (Erez and Isen 2002; Isen and Reeve 2005; Seo et al. 2004, 2010).

[31] Higgins (1997; 1998) proposes a similar theory called regulatory focus theory, which posits that people have two self-regulation systems to regulate the avoidance of punishments and achievement of rewards.

as the aversive motivational system and is responsible for regulating negative affect (Ilies and Judge 2005). The BAS responds to positive feedback by activating behaviour, leading individuals to engage in approach behaviours and increasing effort towards goal attainment (Carver and White 1994). The BIS responds to negative feedback by inhibiting behaviour or reducing effort towards goals to avoid consequences (Fowles 1987). Thus, performance feedback indicating success (failure) relative to a goal induces positive (negative) affective responses, which activates the BAS (BIS), leading to different motivated behaviours (Ilies and Judge 2005). For example, Ilies and Judge (2005) find that individuals experience positive affect after receiving positive performance feedback indicating that they attained a goal, which is associated with them subsequently self-setting more challenging goals for the task and increasing their task effort. Individuals who receive negative performance feedback indicating that they did not attain a goal, experience negative affect and subsequently set less challenging goals for the task and decrease their task effort (Ilies and Judge 2005).

Affective Events Theory (hereafter, AET) provides a seminal framework for understanding how affect influences employee attitudes and behaviours in the workplace (Ashton-James and Ashkanasy 2005). AET argues that certain events, such as receiving performance feedback, occur that trigger affective reactions (Weiss and Cropanzano 1996). The events that trigger strong emotional reactions are those that are relevant to specific goals that the individual holds, such as obtaining a bonus (Lazarus 1991; Latham and Locke 1991). The more important or desirable the goal is, the greater the affective reaction to the event (Weiss and Cropanzano 1996). AET argues that these affective reactions lead to certain affect-driven behaviours that can subsequently have important effects on performance.[32] The behaviours that are triggered by emotional reactions can either increase or decrease task performance. Positive performance feedback is identified as a positive work event, while negative feedback is identified as a negative work event (Ohly and Schmitt 2013). Positive events lead to greater positive affect, while negative events lead to greater negative affect (Ohly and Schmitt 2013). Both positive and negative affect can increase arousal or energization, which can be used to increase effort on a task (Weiss and Cropanzano 1996). However, Weiss and Cropanzano (1996) posit that negative affect is more likely to cause effort and performance decrements than positive affect because it leads to more attention directed towards the presence of a problem and away from the behaviours needed to perform work-related tasks. Research studies based on AET provide support that negative feedback, which is associated with negative affect, leads to decreases in task effort and performance (Alam and Singh 2021).

Taken together, research in psychology suggests that affective reactions occur in response to performance feedback, such that positive performance feedback induces positive affective reactions and negative performance feedback results in negative affective reactions (Ilies and Judge 2005; Ohly and Schmitt 2013; Weiss and Cropanzano 1996). Both theories discussed above posit that positive affect following positive feedback is positively associated with task effort, while negative affect from negative feedback is negatively associated with task effort (Gray 1981, 1990; Weiss and Cropanzano 1996). The theories discussed above highlight the importance of understanding the role of affect as an important mediator of the effects of performance feedback on effort.

[32] AET distinguishes between affect and attitudes, which are stable, overall evaluative judgements (Weiss and Beal 2005). Over time, affective reactions can influence workplace attitudes, such as overall job satisfaction (Ashton-James and Ashkanasy 2005).

2.6 Affect and Effort Spillover

Task temporality refers to how closely in time two or more different tasks are performed. Concurrent multitasking involves a high degree of temporal overlap between two or more tasks, such that there is a high frequency of switching back and forth between the tasks (González and Mark 2005). Sequential multitasking occurs when one task is started and completed before another begins, i.e., it involves a low degree of temporal overlap between tasks (Adler and Benbunan-Fich 2012). A limited number of studies have examined the effects of success or failure on one task onto a second, distinct task, when the tasks are performed sequentially (Brunstein and Gollwitzer 1996; Carver et al. 1979; Hanusa and Schulz 1977; Hiroto and Seligman 1975; Krantz et al. 1974; Quintela 2005; Quintela and Donovan 2008; Roth and Kubal 1975).[33] These studies provide evidence that performance feedback on one task can have effort spillover effects onto other tasks. In some studies, performance failure relative to a standard or referent on one task leads to increased performance on a second task as individuals attempt to compensate for the initial task failure (Brunstein and Gollwitzer 1996; Hanusa and Schulz 1977; Roth and Kubal 1975). However, in most cases, performance failure on the first task results in performance decrements on the subsequent task (Carver et al. 1979; Hiroto and Seligman 1975; Krantz et al. 1974; Quintela 2005; Quintela and Donovan 2008).

Most studies that examine effort spillover effects in multitask settings manipulate participants' future performance outcome expectancy for a second task following performance feedback on the first task, and examine how doing so impacts the effort and performance on a second task (Carver et al. 1979; Hanusa and Schulz 1977; Hiroto and Seligman 1975; Krantz et

[33] All of these studies examine multitask settings using only sequential task temporality, and do not examine the effects of task temporality on effort spillover.

al. 1974; Roth and Kubal 1975). For example, Carver et al. (1979) manipulate whether participants are told that performance on a second task is either positively or negatively correlated with performance on the first task they performed, and then measure effort duration on the second task following negative performance feedback on the first task. They find that negative (positive) outcome expectancies for the second task following negative feedback on the first task leads to decreased (increased) persistence on the second task. Thus, one limitation of examining the effort spillover effects in a multitask setting is the lack of theory explaining the processes that lead to effort spillover effects across unrelated tasks (Quintela 2005).

Quintela (2005) and Quintela and Donovan (2008) are the only studies I am aware of that examine how the affective reactions to performance feedback on one task lead to effort spillover effects on an unrelated second task. Quintela (2005) finds that positive feedback on the first task leads individuals to set more difficult personal goals on a second task, resulting in greater second task performance. Quintela and Donovan (2008) find that negative affect following goal failure on a first task leads to lower personal goals set for a second task, and lower second task performance. From these two studies, there is evidence that affect has significant implications for subsequent effort, including effort spillover effects onto other distinct tasks. However, these two studies do not compare how different management controls common in organizational practices impact affect, and the subsequent effect on effort spillover in multitask settings. Another factor that is not studied in the effort spillover literature is the potential moderating effect of task temporality on the effort spillover effects. All of the studies reviewed in this section examine effort spillover effects in a sequential multitasking setting. However, in practice tasks may be performed concurrently, which may impact the effort spillover effects between tasks (HTT).[34]

2.7 Conclusion

This chapter reviews the relevant psychology, and accounting research that examines the relationships among incentive types, performance feedback, affect, and effort. Furthermore, this chapter defines and discusses affect as a construct. Overall, the literature suggests that affect has important consequences for employee effort in both single-task and multitask settings. However, there remains a paucity of accounting research that examines the affective implications of management control choices, particularly the impact on effort (Hall 2016). My study aims to build on the limited studies that examine the affective consequence of commonly employed management controls in organizations, including incentives and performance feedback in multitask settings. In the proceeding chapter, I define my research setting of interest, and develop hypotheses that predict the effort spillover effects arising from affect in a multitasking setting.

[34] HTT examines the interactive effects of incentive type and task temporality on effort spillover in a multitask setting. However, HTT does not employ theory on affective responses to performance feedback to predict and explain their findings. HTT is discussed in Chapter 3.

CHAPTER 3: DEVELOPMENT OF HYPOTHESES

3.1 Introduction

In this chapter I develop hypotheses about the interactive effects of incomplete incentive contract type, performance feedback valence (i.e., feedback that is favourable or unfavourable), and task temporality, for an incentivized task on effort spillover to an unincentivized task.

It is unclear from prior research reviewed in Chapter 2, whether or how, commonly employed management controls, including incentive contracts and performance feedback, will have affective consequences that impact task effort, particularly in multitask settings. Indeed, researchers have called for more studies to examine the relationship between performance feedback and effort, as previous findings are often contradictory (e.g., Kluger and De Nisi 1996).

I employ goal theory to develop my first hypothesis about individual affective responses to performance feedback under goal-based versus piece-rate incentives. Using psychology theory on outcome-related emotions to feedback on goal attainment or goal failure, my second hypothesis predicts how task temporality between tasks moderates the affective reaction to performance feedback under incomplete incentive contracts. Lastly, I extend the growing research on multitask settings to predict how affective reactions to performance feedback on one task can impact effort onto another task. I build on prior psychology studies that demonstrate that affective reactions to performance feedback on previous tasks can impact effort and performance outcomes on a second task.

The different mechanisms through which incentive contracts and performance feedback operate will be differentially dependent on the characteristics of the task and the environment in which the individual is working. I therefore first discuss in the next subsection important features of my setting of interest.

3.2 Setting Features

I develop my hypotheses in a setting that has several features often found in practice. First, I examine a setting where employees complete two independent tasks as part of their job. Most employees are responsible for performing many different tasks due to advances in technologies, increased reliance on human capital, and changing worker preferences (Lindbeck and Snower 2000).

Second, in my setting one task is incentivized (i.e., pay is performance-based), while the other task is not. As discussed in Chapter 1, organizations typically employ incomplete incentive contracts to reduce the complexity in attempting to employ complete incentive contracts for multitask environments (Christ et al. 2016).

Third, in my setting, for the incentivized task, individuals work under either a piece-rate incentive contract or a goal-based incentive contract that provides a bonus for goal attainment where the goals are assigned by a superior (Locke et al. 1988). Both piece-rate and goal-based incentive contracts are prevalent in practice and represent important control system design choices (Merchant and Van der Stede 2017). Piece-rate incentives are traditionally used in manufacturing industries, but are also common in professions, such as sales, medical, and legal (Agranov and Tergiman 2013; Hodgin 2018; Wilson 2010). According to a 2014 survey, 75 percent of survey respondents state that their organization employs goal-based incentives (WorldatWork and Deloitte Consulting LLP 2014). Thus, goal-based incentives are prevalent across a variety of industries and jobs. Goal-based incentives can be effective because they provide explicit information about the desired level of performance (Anderson et al. 2010; Fatseas and Hirst 1992; Murphy 2000; WorldatWork and Deloitte Consulting LLP 2014).

Fourth, I assume that the assigned performance goal used for the goal-based incentive contract is moderately challenging. Consistent with prior research, I employ a goal with a probability of attainment of 50 percent, such that it is moderately attainable with a significant and continuous level of effort (Kelly et al. 2015; Kylo and Landers 1995; Lee et al. 1997).[35] As will be discussed in the background theory below, I examine how success versus failure to attain a moderately challenging goal tied to goal-based incentives affects affective responses and performance on a subsequent task. Thus, a goal with an expected attainment rate of 50 percent is appropriate for my setting.

3.3 The Effect of Incentives and Performance Feedback on Affective Responses

My first prediction focuses on the affective responses to performance feedback under goal-based versus piece-rate incentives.[36] Specifically, I examine differences in the strength of total affective reactions to feedback under goal-based versus piece-rate incentives.[37] There are at least three reasons to expect that affective reactions to performance feedback will be stronger under goal-based incentives compared to piece-rate incentives where no assigned goal is present.

First, under piece-rate incentives, employees typically receive a “pre-defined” rate of pay for each unit of output they complete (Bonner et al. 2000: 26). In contrast, under goal-based incentives, employees typically do not receive incentive compensation if they fail to attain the goal (Bonner et al. 2000). As a result, goal-based incentives are often described as “all or none”

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[35] Research findings and practice vary widely regarding prescriptions for the expected goal attainment level that should be employed to maximize effort, ranging from as low as 25 percent to as high as 90 percent (Merchant and Van der Stede 2017).

[36] In my setting, performance feedback is a partially endogenous independent variable based on the incentive contract type and performance on the incentivized task and is not exogenously manipulated as either positive or negative. The information presented in the feedback message is expected to induce a positive or negative affective response, such that attaining (not attaining) the assigned goal will induce positive (negative) affective responses and these responses will be stronger relative to the piece-rate incentive conditions.

[37] Total affect includes combines both positive affect and negative affect to determine the overall strength of an individual’s affective state.

incentive contracts (Locke 2004: 131). Assuming the use of at least moderately challenging goals, there is substantial compensation risk to the employee of not attaining the goal. Even a small difference in performance can result in a substantial difference in the size of the incentive received between attaining the goal and not attaining the goal (Locke 2004). Consequently, relative to employees working under piece-rate incentives, and assuming initial commitment to the assigned goal, those pursuing goal-based incentives are likely to experience a sense of accomplishment if the performance feedback indicates they achieved the goal, or are likely to achieve the goal, and will receive the goal-based incentive. In contrast, those working under goal-based incentives will feel disappointment or anger if performance feedback indicates they did not meet the goal, or are unlikely to achieve a goal, and will not receive any incentive compensation (Locke and Latham 1990a; Wright 1992). For example, Wright (1992) argues that individuals working under piece-rate are much less likely than individuals working under goal-based incentives to experience significant affect because their rewards are not dependent on reaching a specific level of performance. Thus, individuals working under goal-based incentives versus piece-rate incentives should experience greater total affect, including greater positive affect for those who attain the goal and greater negative affect for those who fail to attain the goal.

Second, research findings consistently show that when feedback indicates successful performance relative to a goal, individuals evaluate their performance positively and experience greater satisfaction with their performance compared to individuals who do not attain the goal (Locke and Latham 1990b).[38] Consequently, "goals serve as the inflection point" between

[38] Locke and Latham (1990b) find a positive correlation of 0.51 between degree of task success and satisfaction across 12 studies.

satisfaction versus dissatisfaction (Latham and Locke 2007: 709).[39] Thus, the presence of a goal helps to frame the actual performance outcome as either good or bad (Heath et al. 1999).[40] A study by Locke et al. (1970) also shows that feedback about progress towards goal attainment leads to performance satisfaction, when the individual perceives that they are likely to attain the goal. Similarly, a meta-analysis by Koestner et al. (2002) finds that progress towards goal attainment is associated with increases in positive affect and decreases in negative affect, if the progress is favourable towards goal attainment. Thus, in my setting, individuals working under goal-based incentives are more likely to experience greater total affective responses to performance feedback relative to those working under piece-rate incentives. Overall, consistent with Harackiewicz et al. (1984), performance-contingent rewards, such as goal-based incentives are likely to intensify the affective response to performance feedback indicating goal attainment or goal failure because they provide "a tangible symbol of achievement" that can lead to greater salience of the feedback information (Gerhart and Fang 2015: 506). In the absence of a specific goal as is the case with piece-rate incentives, "people do not appraise feedback as significant" and therefore will be less likely to react or respond to the feedback information (Locke & Latham 1990a: 241).

Third, when individuals are not provided with a specific expected performance level or relative performance information, as can often be the case when piece-rate incentives are used, they can only assess their performance relative to their own previous performance results (Kluger et al. 1994; Locke and Latham 1990a). In contrast, goal-based incentives provide an

[39] Satisfaction and positive affect are positively correlated constructs (Lyubomirsky et al. (2005). While some research argues that the two constructs are interchangeable (Veenhoven 1997), others argue that are distinct constructs (Diener et al. 1999).
[40] Heath et al. (1999: 79) argue that goals "systematically alter the value of outcomes." According to Heath et al. (1999: 82), a goal serves as a reference point and helps to categorize "outcomes into regions of gain and loss (or success and failure)," and then leads to either positive or negative affect based on the categorization.

explicit performance level for individuals to use in evaluating whether their actual performance is acceptable or unacceptable (Locke and Latham 1990a). According to Latham and Locke (2007) more difficult goals lead to greater performance satisfaction following goal attainment or goal progress due to the increased effort level required to achieve them relative to easier goals. Research shows that in the absence of assigned goals people either do not self set goals or set less challenging goals for themselves (Carver and Scheier 1990; Harkins and Lowe 2000; Moussa 2000; Terborg and Miller 1978; White et al. 1995; Wood et al. 1999). For example, White et al. (1995) find that individuals who self-set their own goals set goals that are too easy to induce increased effort and positive performance outcomes. Additionally, Terborg and Miller (1978) use an experiment and find that participants working under piece-rate incentives are no more likely to self-set performance goals than those working under fixed pay. Consequently, self-set goals are less likely to cause a strong affective reaction when actual performance is evaluated against them, assuming they are less difficult than an assigned goal would be under performance-contingent incentives. Furthermore, if individuals tend not to set challenging performance goals for themselves under piece-rate incentives, then they are less likely to experience a strong affective reaction to performance feedback (Locke 1991).

Based on the preceding discussion, my first hypothesis, stated in alternative form, is as follows:

> ***Hypothesis 1*****:** Employees' total affective responses to performance feedback will be stronger when they are compensated with goal-based incentives rather than piece-rate incentives.

3.4 The Moderating Effects of Task Temporality

In multitask settings, the way in which different tasks are carried out vary in terms of temporality. Some settings contain a great deal of switching between tasks before any one task is complete (e.g., concurrent multitasking), whereas other settings contain few instances of switching between tasks before any one task is complete (e.g., sequential multitasking) (Salvucci et al. 2009). Thus, multitask environments vary in task temporality along a continuum of extremely low temporality (concurrent multitasking) to extremely high temporality (sequential multitasking) (Salvucci et al. 2009).[41] Performing two (or more) tasks concurrently involves a high degree of temporal overlap between them and can occur for at least two reasons (González and Mark 2005). Individuals may self-initiate switching back and forth between tasks, such as responding to emails while preparing a report, or they may switch between tasks due to external factors, such as when a colleague interrupts their work with an urgent matter (González and Mark 2005).

Conversely, performing tasks sequentially involves a low degree of temporal overlap such that one task is started and completed before another task is commenced (Adler and Benbunan-Fich 2012). There are at least two reasons why individuals may perform two or more tasks sequentially. First, research in neuroscience and psychology shows that the greater each task's cognitive demands, and/or the greater the interference in cognitive processes between tasks, the more difficult it is for an individual to perform more than one task at a time (Rogers and Monsell 1995). For instance, research finds that greater task switching reduces overall performance, due to the switching costs incurred to inhibit and activate cognitive processes for each task (Rubinstein et al. 2001; Spink et al. 2008).[42] Thus, in many cases people may choose to complete tasks sequentially rather than concurrently because doing so reduces cognitive demand.

[41] As described in the method section, I operationalize task temporality using two extreme points on the continuum, concurrent and sequential multitasking to test my theoretical predictions (Salvucci et al. 2009).
[42] There is some evidence that the ability to multitask differs by age group (generation). For example, Carrier et al. (2009) conclude that multitasking is most prominent among the Net generation (i.e., those born after 1980), with the Net generation more likely to engage in frequent multitasking relative to those born before 1980. Voorveld and van der Goot (2013) find that their youngest (13-16) group reports the highest amount of media multitasking, followed

Second, in some settings one task must be completed before work on another task can begin, such as when the output of one task is required as the input for the other task. If so, performing tasks concurrently may not be feasible. To illustrate, many service-based industries, including financial services, telecommunications, and insurance, have adopted a "case management approach" to work design, such that employees are responsible for all activities related to specific customers, rather than specializing in one activity in the value-chain (Davenport and Nohria 1994: 11). In many of these settings only a subset of tasks are incentivized. For example, after completing a sale, salespersons are subsequently responsible for sharing the sales information with other departments to fulfill orders, collaborating with other departments to develop customer solutions, and engaging in customer relationship management activities to ensure future repeat sales (Zingheim and Schuster 2004; Zoltners et al. 2012).

The strength of affective reactions to performance feedback on a task with goal-based incentives is likely to be influenced by task temporality. Pekrun et al. (2006) distinguish between retrospective affective responses and prospective, anticipatory affective responses to performance outcomes. Retrospective affective responses occur following success (failure) to attain a goal, and involve strong positive (negative) affective responses, such as pride (shame) (Pekrun et al. 2006). In contrast, prospective, anticipatory affective responses occur in response to feedback about goal progress, and involve feelings of hope, or anxiety, or hopelessness relating to upcoming goal attainment success or failure (Pekrun et al. 2006). Following Pekrun et al. (2006), I expect that affective reactions (positive or negative) to performance feedback indicating either goal attainment or failure will be stronger than affective reactions to

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by the oldest (50-65) group in their sample, but note that these groups differ on the types of media most often used. However, examining multitasking between generations is beyond the scope of my study.

performance feedback about goal progress *during* performance (i.e., before task completion) of the incentivized task. Performance feedback about goal progress involves an element of uncertainty as to whether the individual will ultimately achieve or fail to achieve the performance goal, and thus elicits weaker affective reactions (Pekrun 1992). Conversely, performance feedback indicating actual success or failure in achieving the performance goal elicits stronger, more intense positive or negative affective reactions because the feedback indicates irrevocable gain or loss (Lazarus 1991).

Under concurrent multitasking, because tasks are performed in close temporal proximity, feedback regarding goal attainment for the incentivized task is not known while working on the unincentivized task. Instead, the feedback under concurrent multitasking only provides information on progress relative to the goal for the incentivized task. On the other hand, for sequential multitasking, in my setting I assume that the incentivized task is completed *prior* to beginning the unincentivized task without interruption. Accordingly, feedback on goal attainment for the incentivized task is available before starting the unincentivized task. Consequently, I predict that task temporality will moderate the effect of incentive contract type on affective responses to performance feedback. Specifically, under a goal-based incentive I expect that for sequential multitasking settings, receiving performance feedback on the incentivized task will lead to stronger affective responses relative to concurrent multitask settings. In contrast, as discussed in the development of my first prediction, piece-rate incentives are not contingent upon achievement of a specific performance level, and there is either an absence of, or an inexplicit referent upon which to evaluate performance against. Thus, I do not expect any difference in the strength of the affective response to performance feedback under piece-rate incentives between concurrent and sequential multitasking. Accordingly, my second hypothesis, stated in alternative form, is as follows:

> ***Hypothesis 2*****:** The positive effect of goal-based as opposed to piece-rate incentives on the strength of employees' total affective responses to performance feedback will be greater in sequential multitasking than in concurrent multitasking.

3.5 Effort Spillover in a Multitask Environment

Following HTT, I refer to effort spillover as an outcome whereby effort induced by incentives on one task positively influences the effort on an unincentivized task. HTT show that the spillover effects between an incentivized and unincentivized task are greater when the tasks are performed concurrently compared to when they are performed sequentially. HTT make an important contribution to the literature by demonstrating a caveat to Holmstrom and Milgrom's (1991) conclusion that incomplete incentives may be ineffective in multitask settings. HTT find that under piece-rate incentives, spillover onto the unincentivized task is greater when tasks are performed concurrently relative to when they are performed sequentially, which they attribute to the temporary activation (arousal) from the presence of the incentive. Their results suggest that the activation response to piece-rate incentives is not sustained long enough to induce effort spillover in the sequential task condition. However, HTT do not examine the spillover effects of different types of incentive schemes, or the affective reactions to performance feedback.

Research on goal setting and motivation demonstrates that factors such as previous successes and failures on the task can influence one's subsequent effort level (Campbell 1982; Latham and Locke 1991; Sears 1940). A limited number of studies have examined the subsequent effort spillover effects of initial task success or failure on a second task in sequential settings (Carver et al. 1979; Kernis et al. 1982; Radosevich 1998; Quintela 2005; Quintela and

Donovan 2008). Collectively, these studies provide evidence that affective reactions to performance feedback on one task can have spillover effects that influence the level of goal difficulty for personal goals, motivation, and performance on a second task. An underlying reason for the spillover effects to other tasks in settings with performance feedback is that prior performance on a task influences an individual's affective state (Kluger and DeNisi 1996; Latham and Locke 2007).

Because there are a limited number of studies examining goal setting and performance feedback in a multitask environment, Quintela (2005) and Quintela and Donovan (2008) develop and validate the motivational spillover model.[43] The model examines how goal setting and subsequent positive or negative performance feedback on one task impacts self-set goals and performance on a second, unrelated task. The motivational spillover model predicts that when an individual has a performance goal for a task and subsequently receives positive (negative) feedback that performance met (did not meet) the goal, the individual experiences positive (negative) affect (Quintela 2005). The positive (negative) affective reaction then increases (decreases) one's self-efficacy perceptions for a subsequent task. Consequently, according to the motivational spillover model, the increase (decrease) in self-efficacy leads an individual to self-set a higher (lower) goal for a second, distinct task.[44] Other studies examining the relationship between affect and performance show a positive association between one's affective state and task performance, in the absence of a goal (Hirt et al. 1996; Isen and Reeve 2005; Miner and

[43] The motivational spillover model integrates elements from goal-setting theory (Locke and Latham 1990a, 1990b; Locke et al. 1981), social cognitive (or self-efficacy) theory (Bandura 1986, 1991, 1997) and Carver and Scheier's (1982, 1990, 2000, 2012) control theory, applying them to a multitask environment.
[44] Quintela (2005) does not specify whether the setting of lower or higher goals for the second task is a conscious versus an unconscious automatic process. According to Gist (1987: 472), self-efficacy beliefs "are considered to be the outcome of a process of weighing, integrating, and evaluating information about one's capabilities, and which, in turn, regulate the choices people make and the amount of effort they apply to a given task". Therefore, it appears to be an active, conscious process.

Glomb 2010; Tsai et al. 2007; Weiss and Cropanzano 1996).[45] For example, Hirt et al. (1996) find that participants who are induced to have positive affect perform better on an unincentivized task in a given period of time relative to those who are induced to have a negative mood. Isen and Reeve (2005) examine how positive affect impacts individuals' subsequent performance on both an interesting and uninteresting task, when they are given free-choice to work on one or both tasks in a given period of time. They find that participants induced to have a positive affective state have greater overall effort duration, effort intensity and performance outcomes across both the interesting and uninteresting task relative to those in a neutral affective state. Thus, they find evidence that positive affect increases subsequent task effort. The motivational spillover model is of particular relevance to my study because it provides a theoretical basis for expecting that the affective response to performance feedback relative to a goal on one task can influence effort on another task (Quintela and Donovan 2008).

There are three important distinctions between the Quintela (2005) and the Quintela and Donovan (2008) studies and mine. First, they examine how performance relative to a goal on one task impacts the level of difficulty for individuals' self-set performance goals for a second task, rather than examining the direct impact on their performance on a second task.[46] Second, neither study employs incentives for goal attainment, whereas an important focus of my study is examining the effects of incentive contract type on affect and effort spillover. Third, both studies

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[45] Research indicates a complex relationship between affect and self-efficacy (Hill and Ward 1989; Scott and Cervone 2002). The motivational spillover model shows self-efficacy as fully mediating the relationship between affect and performance (Quintela 2005), however, other studies show a direct relationship between affect and performance (Miner and Glomb 2010; Weiss and Cropanzano 1996). The focus of my study is to examine the direct effects of affect on subsequent effort, however, for completeness, I also include measures of self-efficacy to permit examination of self-efficacy as a potential partial mediator.

[46] Quintela (2005) has participants identify self-set goals for both the first and second task. Quintela and Donovan (2008) assign participants goals for the first task, and then manipulate the feedback that all participants receive, ensuring that everyone receives negative feedback, to observe how negative feedback impacts the goals participants self-assign for a second task.

only examine sequential task settings. My study builds on Quintela (2005) and Quintela and Donovan (2008) by examining how task temporality influences spillover effects.

Based on the motivational spillover model, and given my first two hypotheses, I predict that the affective response to performance feedback under goal-based incentives will be stronger than under piece-rate incentives (H1). Moreover, I predict that the greatest effort spillover to the unincentivized task will occur in response to positive performance feedback on the incentivized task with goal-based incentives when the tasks are performed sequentially. Specifically, I expect that when an individual receives positive feedback about their performance relative to an assigned goal on the incentivized task, the stronger positive affective reaction in the sequential versus concurrent multitask setting (H2), will lead to more effort spillover to the unincentivized task. I also predict that the lowest effort spillover to the unincentivized task will occur in response to negative performance feedback on the incentivized task with goal-based incentives when the tasks are performed sequentially. Specifically, I expect that when an individual receives negative feedback about their performance relative to an assigned goal on the incentivized task, the stronger negative affective reaction in the sequential versus concurrent multitask setting (H2), will lead to less effort spillover to the unincentivized task.

My final hypotheses, stated in alternative form, are as follows:

> ***Hypothesis 3a*****:** Effort on the unincentivized task will be greatest following positive feedback on the incentivized task when goal-based incentives are present in sequential multitasking relative to when goal-based incentives are present in concurrent multitasking, or when piece-rate incentives are present in concurrent or sequential multitasking.

> ***Hypothesis 3b*****:** Effort on the unincentivized task will be lowest following negative feedback on the incentivized task when goal-based incentives are present in sequential multitasking relative to when goal-based incentives are present in concurrent

multitasking, or when piece-rate incentives are present in concurrent or sequential multitasking.

Tension exists for H3a and H3b. In contrast to my focus on affect causing differences in effort spillover, HTT rely on activation (arousal) theory to support their predictions and findings. Activation theory suggests that incentives activate a temporary physiological response, or an enhanced motivational state in the brain, resulting in greater performance outcomes (Gardner and Cummings 1988). Studies using neuroimaging provide evidence that incentives induce temporary activation in certain parts of the brain that are associated with motivation, independent of task-specific motivational effects (Locke and Braver 2008). These findings support the null hypothesis that there will be no significant differences in effort spillover in my setting because I compare two different incentive contract types, which are both likely to lead to temporary activation in the brain.[47] Additionally, because activation is a temporary motivational response, it allows for effort spillover to occur in concurrent multitasking consistent with HTT's findings but may not support effort spillover to occur in sequential multitasking. Similarly, economic theory also biases against me finding differences in effort spillover between the two incentive contract types and multitasking settings of interest because it predicts that under an incomplete incentive contract, no effort will be directed towards the unincentivized task (Holmstrom and Milgrom 1991). Overall, both activation theory and economic theory bias against me finding support for H3a and H3b.

[47] In contrast, HTT compare piece-rate incentives to a fixed wage contract, where there is likely to be a significant difference in activation.

3.6 Summary

This chapter presents my predictions about the effects of incomplete incentive contract types and performance feedback valence on effort spillover in a multitask environment, and how these effects will be moderated by task temporality. The overall objective of my predictions is to understand how affective responses to management controls can have important motivational implications across different tasks. The predictions and their relationships are summarized in Figure 1.

<< Insert Figure 1 About Here >>

CHAPTER 4: PILOT STUDY INSTRUMENT AND RESULTS

4.1 Purpose

Before conducting my main study, I administer a pilot study to address a potential design challenge from using online participants versus in-person participants for my main study. Generally, researchers examining affect using affect induction procedures carry out their studies in laboratories to ensure that they control the research environments in which participants are completing their studies (Ferrer et al. 2015). In contrast, researchers have limited control over the environments in which online participants are carrying out the studies, making it more difficult to induce affect (Ferrer et al. 2015). My pilot test helps to ensure that I am able to induce appropriate affective responses in online participants for my setting of interest.

4.2 Method

Online labour markets (e.g., Amazon's Mechanical Turk; CrowdFlower; Prolific) provide researchers with platforms for accessing a large diverse pool of participants for relatively low costs and in a relatively short time to gather data (Farrell et al. 2017). In addition, due to the recent global pandemic, restricted access to other participant pools has made these online platforms particularly important. Despite concerns that online workers produce lower quality responses (Chandler et al. 2014; Keith et al. 2017; Goodman et al. 2012), accounting research demonstrates that online workers are acceptable proxies for non-expert workers, exerting equivalent effort to student participants for both low and high complexity tasks (Buchheith et al. 2019; Chen, Pesch, and Wang 2020; Farrell et al. 2017).

Online workers have been used in accounting research to study a number of different topics including management control system designs (Chen, Lil, and Vance 2020), information systems security (Trinkle et al. 2014), and non-professional investor judgments and decision-making (Krische 2019; Rennekamp 2012; Stinson et al. 2021). In addition, a vast number of studies in psychology have employed online workers to study various issues, including addiction (Cunningham et al. 2017; Strickland and Stoops 2019), and personality disorders (Miller et al. 2017). Important to my research focus, recent studies in psychology have shown that affective states can be effectively induced in online participants using induction procedures more commonly employed in laboratory studies (see a meta-analysis by Ferrer et al. 2015).

To test the relationship between goals and affect, I employ an experiment using Amazon's Mechanical Turk platform (hereafter, MTurk), an online labour market, which has been used to recruit participants for management accounting experiments (Chen, Pesch, and Wang 2020; Farrell et al. 2017).[48] Previous studies in psychology have shown that feedback indicating goal attainment or goal failure does induce positive or negative affective reactions, respectively, after individuals actively perform a task (Kluger and DeNisi 1996; Hirt et al. 1996; Miner and Glomb 2010; Tsai et al. 2007; Weiss and Cropanzano 1996). However, it is an empirical question whether feedback about goal attainment or failure will induce strong enough affective reactions in online participants. For my pilot study I employ a simple affect induction technique to manipulate whether participants are told that they either attain or fail to attain a goal tied to goal-based incentives. While research in psychology and marketing has applied passive manipulation techniques, such as having participants read a vignette, view an image, or watch a short video, to evoke certain affective states (Boudewyns et al. 2013; Göritz and Moser 2006; Mayer et al. 1995; Parrott and Hertel 1999; Ryan 2012; Verheyen and Göritz 2009), no known

[48] The study was reviewed and approved by the Office of Research Ethics at the University of Waterloo (ORE#42010).

study has employed such techniques to show whether goal attainment/failure leads to significant positive/negative affective reactions. If I am able to successfully induce participants to experience positive (negative) affect under the goal attainment (failure) manipulation using a passive manipulation technique in the pilot study, this will provide more confidence that I can induce affective responses in my main study using an active manipulation technique.

Following Johnson et al. (2000), I employ vignettes to investigate “reactive emotion norms” to real or fictious scenarios (Heise and Calhan 1995: 236). A vignette refers to a short, rich description of an event in order to elicit focused participant responses to its contents (Schoenberg and Ravdal 2000). Studies employing vignettes either provide participants with a specific hypothetical scenario and ask them to imagine that they are actually experiencing the event, or ask participants to reflect on their own personal experiences to induce certain emotions (Westermann et al. 1996). Vignettes have been used extensively in psychology and marketing research because they have been shown to successfully evoke specific moods and emotions in participants through passive manipulation (Mayer et al. 1995; Parrott and Hertel 1999). Prior studies that induce affective states find that even subtle affect manipulations, such as receiving a small token gift, receiving a feedback message, or watching a short film, can last for a substantial period of time (e.g., Estrada et al. 1994). Consistent with Heise and Calhan (1995), I expect that emotions experienced while imagining an event will correlate closely with the emotions that would be experienced in a similar real-life event.

I employ a 3 (*Vignette*) x 2 (*Affect Sign*) between subjects experimental design. I create six unique conditions using three different vignette scenarios, with each scenario designed to elicit either a positive affective reaction or a negative effective reaction, based on manipulating certain words in the vignettes. Two of the vignettes (*Self-Reflection* and *Course*) are adapted from prior research (Gasper 2004; Smith and Lazarus 1993), and I create a new vignette (*Goal*) to study affective reactions to goal attainment and failure under goal-based incentives. The two vignettes that are adapted from prior studies have been shown to induce emotion reactions (Gasper 2004; Smith and Lazarus 1993; Westermann et al. 1996).[49] I employ two previously validated vignette manipulations that allow me to compare the online participants' affect reactions to each of these vignettes with the affect reactions to my goal-based vignette. By comparing the affect reactions of my vignette to other validated vignettes, I can ensure that the strength of the positive and negative affective reactions to each of the positive and negative scenarios in my vignette are comparable.

The *Self-Reflection* vignette adapted from Gasper (2004) has been used in previous studies to induce positive or negative affect, by asking participants to reflect on and write about a recent life event that either made them feel "happy, joyful, and positive," or "sad, upset, and negative" (Gasper 2004: 412), as shown in Appendix A.[50] The *Course* vignette adapted from Smith and Lazarus (1993) was originally used to examine the impact of negative performance appraisals on negative affect. Because only negative affective responses are examined in Smith and Lazarus (1993), I adapt the *Course Failure* scenario and create a comparable *Course Success* scenario to study the impact of positive performance appraisal on positive affect, as shown in Appendix B. I also develop the *Goal* vignette to examine how performance feedback regarding

[49] Both Gasper (2004) and Smith and Lazarus (1993) employ different scales and do not employ the PANAS Scales to measure the affective responses to their scenarios. Additionally, Smith and Lazarus (1993) only examine negative affect in their scenarios.

[50] The *Self-Reflection* vignette is a different manipulation vignette type relative to the *Course* vignette, such that it may induce incidental (general) affect instead of integral affect related to a specific target (Västfjäll et al. 2016). Incidental affect is consistent with mood, such that it does not have a direct cause, while integral affect is consistent with emotion, such that it is derived from a particular object, event, or individual. However, the purpose of employing these different vignettes is to ensure that the *Goal* vignette provides comparable affective reactions to different passive manipulation techniques previously employed to induce positive or negative affect.

goal attainment/failure (i.e., *Goal Attainment* and *Goal Failure*) under goal-based incentives leads to positive/negative affect, as presented in Appendix C.

The dependent variables of interest are measures of participants' felt positive affect (*Positive Affect*) and negative affect (*Negative Affect*) based on the PANAS (Watson et al. 1988). Refer to Appendix D for details on the PANAS. The PANAS measures positive and negative affect based on 20 adjective-based affect measures to develop two scales, with each consisting of 10 items (Watson et al. 1988). Participants respond to each measure using a 5-point Likert scale with endpoints labeled "Not at all" (1) and "Extremely" (5).

To ensure participants are able to meaningfully respond to the vignettes, I pre-screen them for a minimum education level (i.e., post-secondary degree), an approval rating of at least 95% and at least 500 approved Human Intelligence Tasks (i.e., HITs) (Chen, Pesch, and Wang 2020; Peer et al. 2014).[51] Each participant is randomly assigned to one of the six vignette conditions. Immediately after reading the vignette, participants complete the PANAS (Watson et al. 1988) to measure their affective reactions to the manipulation. Following the PANAS questionnaire, participants are asked to complete post-experimental questions to gather demographic information and to provide an ex-post check of the pre-screening requirements (i.e., confirming completion of post-secondary education). Two attention check questions are included in each condition to ensure that participants read the instructions carefully.

[51] Because the *Course* vignette manipulates whether a person passes or fails a university course, I require all participants to have completed post-secondary education to ensure that they can reflect on their personal experience. A HIT is a single task that an MTurk worker can participate in and complete to earn rewards. A HIT approval rating of 95% means that the participant's participation in prior tasks was approved in at least 95% of the studies that the participant has completed.

4.3 Results

I recruit 582 MTurk participants for the experimental study.[52] Participants earn $1.25 USD for their participation and spend an average of 7.2 minutes to complete the study. [53] On average, participants are 40.6 years old, have 18.9 years of work experience, and 55.3% percent are male (43.8% female and 0.9% identify as other or prefer not to disclose). Most participants (99%) are current residents of the United States. Untabulated analysis shows there are no significant differences in age, education, work experience, or gender among the six conditions.

Based on an exploratory factor analysis of the participants' responses to the 20 affect measures, I identify two factors both with eigenvalues greater than 1, which together explain 92 percent of the total variance across all possible factor loadings (Murphy and Free 2016).[54] Using a varimax rotation to maximize variance of loadings for the two separate factors and only including the variables that load on a factor at greater than 0.40 (Ford et al. 1986), results in one positive and one negative affective factor. Both factors consist of 10-items, consistent with the PANAS scales (Watson et al. 1988) and have Chronbach's alphas greater than 0.90 indicating high reliability (DeVellis 2012). Factor analysis results are reported in Table 1.[55]

<< Insert Table 1 About Here >>

[52] A total of 624 participant responses were collected, however 22 participants provided incomplete responses and are not included in the analyses. In addition, 16 participants did not correctly answer the comprehension check questions and 4 participants did not meet the eligibility requirements to participate in the survey and thus are excluded from the analyses. Statistical inferences are unaffected by including these participants.
[53] The payment of $1.25 USD translates to $10.42 USD per hour based on the average 7.2 minutes to complete the study, which is an appropriate wage for this participant group (Chen, Pesch, and Wang 2020).
[54] An exploratory factor analysis is employed instead of a confirmatory factor analysis. Consistent with prior research, a confirmatory factor analysis with a two-factor model resulted in a mediocre fit because it is a restrictive tool that constrains the loading of variables that are a priori specified in the model, which may not be appropriate when studying the factor structure of personality traits or affective states (Borkenau and Ostendorf 1990; Tuccitto et al. 2010).
[55] The Chronbach's alphas for the two PANAS scales are consistent with those found by Watson et al. (1988).

The dependent variables of interest are computed by summing the scores for the 10-item scale to measure positive affect (*Positive Affect*) and the 10-item scale to measure negative affect (*Negative Affect*). Thus, values for both *Positive Affect* and *Negative Affect* range from 10 to 50. The pairwise correlation between *Positive Affect* and *Negative Affect* is -0.43 (p-value < 0.01; two-tailed), confirming a negative correlation between them.[56] Table 2 presents descriptive statistics for *Positive Affect* and *Negative Affect* by vignette condition.[57]

<< *Insert Table 2 About Here* >>

Figure 2 and Figure 3 present average *Positive Affect* and *Negative Affect* by *Vignette* and *Affect Sign* depicted in graphical form, respectively. Figure 2 indicates that the three positive vignette conditions (i.e., *Positive Self-Reflection*, *Course Success*, *Goal Attainment*) elicit stronger *Positive Affect* relative to the three negative vignette conditions (*Negative Self-Reflection*, *Course Failure*, *Goal Failure)*. Figure 3 indicates that the three negative vignette conditions elicit stronger *Negative Affect* relative to the three positive vignette conditions.

<< *Insert Figure 2 About Here* >>

<< *Insert Figure 3 About Here* >>

Tables 3 and 4 present the results of a two-way analysis of variance (ANOVA) to compare the main effects of *Vignette* and *Affect Sign* and their interactive effect on the dependent variables *Positive Affect* and *Negative Affect*, respectively. I expect a significant main effect for *Affect Sign*, given that each *Vignette* has a positive affect and a negative affect scenario. As

[56] Watson et al. (1988) find invariably low correlations between the two factors ranging from -0.12 to -0.23, while Tellegen et al. (1999) find a significant, negative correlation between the two factors of -0.43, and Green and Salovey (1999) report a significant, negative correlation of -0.58. My correlation findings are consistent with Watson et al.'s (1999) argument that the positive and negative scales are separate scales, with a low correlation between them, but are not entirely independent of one another.

[57] *Positive Affect* and *Negative Affect* are highly correlated with factor scores derived from the factor analysis at 0.98 (untabulated: p-value < 0.01; two-tailed) and 0.97 (untabulated: p-value < 0.01; two-tailed), respectively.

expected, the ANOVA results reveal a significant main effect of *Affect Sign;* however, this is qualified by a significant *Affect Sign* x *Vignette* interaction on *Positive Affect* (Table 3, Panel A) and *Negative Affect* (Table 4, Panel A) (both p-values < 0.01; two-tailed).[58]

<< Insert Table 3 and Table 4 About Here >>

Simple effects tests for *Positive Affect* presented in Table 3, Panel B confirm that the three vignette conditions designed to elicit positive affect resulted in significantly greater *Positive Affect* relative to the corresponding negative affect condition for each *Vignette* (all p-values $\leq$ 0.01; two-tailed). Simple effects tests presented in Table 3, Panel C compare the strength of the *Positive Affect* elicited by each of the vignette conditions designed to elicit positive affect. I find that *Positive Affect* does not differ significantly between *Positive Self-Reflection* and *Goal Attainment* (t = 1.87; p-value = 0.42; two-tailed), and is only marginally significantly greater under *Course Success* relative to *Goal Attainment* (t = 2.85, p-value = 0.05; two-tailed), while *Course Success* elicits a greater *Positive Affect* relative to *Positive Self-Reflection* (t = 4.63, p-value < 0.01; two-tailed).

Simple effects tests for *Negative Affect* presented in Table 4, Panel B confirm that each of the vignette conditions designed to elicit negative affect resulted in significantly greater *Negative Affect* relative to the corresponding positive affect conditions for each vignette (all p-values < 0.01; two-tailed). Simple effects tests presented in Table 4, Panel C compare the strength of the *Negative Affect* elicited by each of the vignette conditions designed to elicit negative affect. *Course Failure* elicits a greater negative affective response relative to *Negative Self-Reflection* and *Goal Failure* (both p-values < 0.01; two-tailed). However, I find no significant difference in

[58] I also find a significant main effect of *Vignette* for *Negative Affect* indicating that there are differences in the strength of the negative affective responses among the *Vignettes* (refer to Table 4, Panel A).

Negative Affect between *Negative Self-Reflection* and the *Goal Failure* conditions ($t = 0.88$, p-value = 0.95; two-tailed). The results from Table 3 and 4 confirm that my *Goal* vignette is as effective as previously validated vignettes in manipulating affect.

4.4 Summary

Overall, the pilot study results provide support that under goal-based incentives, performance feedback about successful performance relative to a goal leads to a significant positive affective response, and feedback about performance failure relative to a goal leads to a significant negative affective response, consistent with my theory. The results from my pilot study confirm that I am able to induce comparable affective responses in online participants for my setting of interest. Thus, I employ online participants for my main study instrument, which is discussed in detail in Chapter 5.

CHAPTER 5: MAIN STUDY RESEARCH INSTRUMENT

5.1 Overview

To test my hypotheses developed in Chapter 3, I employ a 2 x 2 between subjects experimental design (see Figure 4). I manipulate the type of incentive contract used for the incentivized task (*Task 1 Contract Type*) at two levels: *Goal* and *Piece-rate*. I manipulate *Task Temporality* at two levels: *Concurrent* and *Sequential*. Participants complete two real-effort tasks where Task 1 performance is incentivized, and Task 2 performance is unincentivized. My dependent variables are participants' affective responses to performance feedback on the incentivized task (*Positive Affect*, *Negative Affect*, and *Total Affect*) and their performance on the unincentivized task (*Task 2 Performance*), which proxies for effort given the effort intensive nature of the tasks (Kelly et al. 2015).

<< *Insert Figure 4 About Here* >>

This chapter is organized as follows. Section 5.2 describes the two real-effort tasks that are employed. Section 5.3 describes the participants. Section 5.4 details the experimental procedures. Section 5.5 describes the independent variables that were manipulated. Section 5.6 describes the various dependent variables and process measures. Section 5.7 describes other control variables measured in the post-experimental questionnaire. This chapter concludes in Section 5.8.

5.2 Tasks

I employ two different tasks to improve the generalizability of theory.[59] Following Choi et al. (2021), I employ two real-effort tasks that have strong positive links between effort and performance (i.e., performance is a good proxy for effort). For Task 1, I employ the letter search task (see Appendix E), where participants count the number the of times a search letter (e.g., X) appears in a grid with a random array of letters within a grid (Choi et al. 2021). Following, Choi et al. (2021), I restrict the letters in a grid to either X or O and use a 10 x 10 grid size to reduce the amount of guessing that participants engage in.[60] One unit of performance is defined as one letter search grid correctly completed. Participants must enter the correct number of X's into the input box to progress to the next letter search grid.

For Task 2, I employ the decode task (see Appendix F). In the decode task, participants translate three-digit numbers into letter using decoding keys provided at the bottom of the computer screen (Chow 1983). To prevent participants from memorizing the decoding key in an attempt to improve their performance, a different key is provided for each decode. Following Choi et al. (2021), one unit of performance is defined as a single correct decode.[61] Participants must enter the letter into the input box to progress to the next decode.

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[59] Using the same task would likely increase the likelihood of finding support for my hypotheses because research shows that receiving positive (negative) performance feedback about a task leads to positive (negative) affective feelings towards that particular task and can increase (decrease) one's self-efficacy about their ability to perform well on that task (Carver and Scheier 1990, 2000; Ilgen and Davis 2000). Thus, using two different tasks enhances the generalizability of my theory because it allows me to show how affective reactions to performance feedback on one task can influence the motivational processes associated with a second distinct task (Quintela 2005).

[60] Participants who input the incorrect number into the input box are shown a red 'X' indicating that the response is incorrect and must re-click on the input box to enter a new response, leading to a time penalty of a couple of seconds for each incorrect response to discourage guessing. Based on my main study findings discussed in Chapter 6, I do not find any significant differences in the number of errors on the letter search task or the decode task between my conditions (untabulated: all p-values $\geq$ 0.30; two-tailed). Therefore, it does not appear that guessing strategies were more common in some conditions relative to others.

[61] Choi et al. (2021) find that task attractiveness for both the 10 x 10 letter search task and the decode task does not significantly differ from the neutral scale value of 0. A meta-analysis by Cerasoli et al. (2014) and a study by Fessler (2003) find that task attractiveness moderates the effectiveness of incentives on task performance. Therefore, my

5.3 Participants

Given the results from my pilot study presented in Chapter 4, I use online labour market workers recruited through MTurk as participants in my study, as they have sufficient ability and knowledge to carry out the real-effort tasks that I employ. There is little evidence to suggest that higher educated or more experienced participants perform effort-sensitive experimental tasks differently than less educated participants (see Ball and Cech 1996). MTurk workers are commonly used for management accounting experiments because they provide a diverse and representative sample of the population (Chen, Pesch, and Wang 2020; Farrell et al. 2017). Farrell et al. (2017) show that online participants provide comparable effort levels to student participants and are appropriate proxies for non-expert workers, even when completing tasks that require appropriate skills and/or costly effort to perform well on tasks that are commonly employed in accounting research. Thus, MTurk workers are appropriate participants for my study. Consistent with prior accounting studies that employ MTurk participants, I pre-screen participants with an approval rating of at least 95%, and at least 500 approved HITs (Chen, Pesch, and Wang 2020; Peer et al. 2014).

5.4 Experimental Procedures

Figure 5 describes the detailed steps of my main study research instrument. Participants that meet the eligibility requirements sign up to participate in the study through MTurk. Once participants sign up to participate in the study they are given a website link to begin the study. Participants first read the instruction screen and then provide electronic consent to participate in the study. After participants enter their ID, the program provides instructions on how to complete

choice in tasks must ensure that neither task is attractive (or unattractive) enough to preclude me from observing performance effects from incentives and/or feedback. Questions about task attractiveness were not included in the main study in order to reduce the number of post-experimental questions asked.

each of the two tasks. Participants are then provided with the opportunity to practice each task during a two-minute practice round where they spend one-minute on the letter search task, followed immediately by one-minute on the decode task. No incentives are provided for either task during the practice round, but participants are told to use the practice round to complete as many letter search grids and decodes as possible to become familiar with the tasks.[62]

<< *Insert Figure 5 About Here* >>

After the practice round is completed participants are given instructions about the production rounds. The program randomly assigns participants to one of four experimental conditions: 1) *Piece-rate*/*Concurrent*; 2) *Piece-rate*/*Sequential*; 3) *Goal*/*Concurrent*; and 4) *Goal*/*Sequential*. All participants are told that they will complete a total of four production rounds, with each round lasting 3 minutes, for a total of 12 minutes. Consistent with prior research examining multitask environments, I explicitly inform all participants that their objective across the four production rounds is to complete as many letter search grids and decodes as possible (Brüggen et al. 2018; Christ et al. 2016; HTT, Kachelmeier et al. 2008).

All participants are told that they will earn $3.00 USD in fixed compensation plus incentive compensation earned during the production rounds. The fixed compensation ensures that all participants receive a minimum acceptable compensation amount for their participation in the study, regardless of their performance on the tasks, consistent with requirements of the Office of Research Ethics at the University of Waterloo. Based on preliminary testing results (discussed below), the average expected incentive compensation earned on Task 1 is material relative to the fixed compensation amount. This is intended to induce significant effort across all conditions and

[62] Consistent with Choi et al. (2021), I do not compensate participants for their practice round performance to avoid introducing confounding effects of removing or changing the incentive type on the tasks between the practice rounds and the production rounds.

should increase my ability to observe variation in affective responses from the performance feedback on Task 1. All participants are instructed that they will not receive any incentive compensation for Task 2. Participants are also told that they will only receive performance feedback on their Task 1 performance, and not for their Task 2 performance. This allows me to ensure that affective reactions to performance feedback are in response to the incentivized task (Task 1) only. By not providing feedback on Task 2 performance, this is also consistent with a firm's inability to contract on Task 2 performance in my setting of interest.

To ensure their understanding of the tasks and details of the condition to which they are assigned, participants complete a computerized comprehension quiz before proceeding to the first production round to test their understanding of the *Task 1 Contract Type, Task Temporality*, and details regarding the tasks and feedback (see Appendix G). Participants have to answer each question correctly before proceeding to the production rounds.

During the 12-minute production period, while completing Task 1, participants receive real-time feedback about their performance on Task 1 for each production round. This allows participants to see the number of letter search grids that they have correctly completed during the production round. However, they are not given their total cumulative performance across production rounds on Task 1 until after completing the first two production rounds. Immediately after completing the first two production rounds, participants in all conditions are provided with an explicit performance feedback message about their Task 1 performance only. The feedback message informs participants of their total cumulative performance on Task 1 for the first two production rounds and the amount of the incentive pay they have earned (as discussed in section 5.5). Following the feedback message participants complete the 20-item PANAS to measure their affective reactions to the Task 1 performance feedback (Watson et al. 1988). After completing the PANAS, participants continue with the remaining two production rounds. Following completion of the fourth production round, participants receive a final feedback message confirming the total number of letter search grids completed, and the total compensation they earned (including fixed and incentive compensation). Finally, participants complete a post-experimental questionnaire and submit the study in order to receive compensation. The total compensation earned during the study is paid to participants electronically through the MTurk platform within 48 hours of completing the study.

5.5 Independent Variables

I manipulate two independent variables between participants: *Task 1 Contract Type* and *Task Temporality*. First, I manipulate *Task 1 Contract Type* as either *Goal* or *Piece-rate*. Participants assigned to the *Goal* condition are instructed that they will earn $2.75 USD if they attain a goal of completing 11 letter search grids by the end of the production rounds.[63] In addition, they can earn $0.25 USD for every letter search grid they complete above the goal (see Appendix H). A goal-based incentive plus piece-rate incentive above the goal is employed because this is an effective bonus structure to increase total effort on the task (Bonner et al. 2000; Murthy 2010) and is employed in previous studies examining goal-based incentives (e.g., Lee et al. 1997; Wright 1992). Consistent with prior research (Kelly et al. 2015; Lee et al. 1997), the difficulty of the assigned performance goal is set such that it is expected to be attained by about 50 percent of participants assuming consistent levels of effort. Using a moderately challenging

[63] The goal of 11 letter search grids is based on preliminary testing results. For the preliminary testing, a total of 110 MTurk participant were recruited to perform two, three-minute production rounds of the letter search task working under piece-rate incentives of $0.15 per letter search grid completed. Participants were also paid $1.00 USD in fixed compensation for their participation. 10 participants were excluded because they did not complete any letter search grids, and therefore exerted no effort on the task. The remaining 100 participants completed an average of 11 (median of 10) letter search grids. Based on the preliminary test, 50 percent of participants completed 11 letter search grids or more across the production rounds.

goal with a 50 percent probability of attainment allows me to obtain a sizable number of participants who attain and do not attain the goal. This is necessary in order to provide sufficient statistical power to test my hypotheses. Those working under the *Piece-rate* condition earn a piece-rate of $0.25 USD for each letter search grid they complete (see Appendix H). The performance-based pay is designed such that all participants, regardless of whether they are assigned to the *Goal* or *Piece-rate* condition earn equivalent performance-based pay for the same level of performance, so long as those assigned to the *Goal* condition, on average, achieve their assigned goal of 11 letter search grids.

Second, I manipulate *Task Temporality* as either *Concurrent* or *Sequential* by manipulating the number of temporal increments for each task, (i.e., the degree of switching between tasks). In both *Concurrent* and *Sequential*, the 12-minute production period is divided into four, three-minute production rounds. Participants assigned to the *Concurrent* temporality condition are instructed that for each three-minute production round, they will perform the two tasks concurrently, such that they spend 90 seconds on the letter search task (Task 1) followed immediately by 90 seconds on the decode task (Task 2). Participants assigned to the *Sequential* temporality condition are instructed that they will perform the two tasks sequentially, such that for the first two 3-minute production rounds they perform the letter search task (Task 1), and for the final two 3-minute production rounds they perform the decode round task (Task 2). Therefore, across both *Task Temporality* conditions, participants spend a total of six minutes on each task.

Third, *Feedback Direction* is a partially endogenous independent variable based on the *Task 1 Contract Type* and *Task 1 Performance* at the end of production round 2. I use the term *Feedback Direction* because participants working under goal-based incentives are informed about their *Task 1 Performance* relative to the assigned goal, while those working under piece-rate incentives are told their cumulative *Task 1 Performance* at that same point in time. *Feedback Direction* occurs based on three types: participants in the *Goal* condition nested in terms of goal attainment (i.e., for those who attain versus for those who do not attain the assigned goal), and in the absence of a goal for those in the *Piece-rate* condition. For example, for participants in the *Goal* condition who attain the goal by the end of production round 2, the feedback message states:

> For Production Rounds 1 and 2, you completed a total of X letter search grids.
>
> [Concurrent condition: So far,] You have earned $2.75 USD + ($0.25 USD*(X – 11)) for your output on the letter search task based on your goal to complete 11 letter search grids.

For participants in the *Goal* condition who do not attain the goal by the end of production round 2, the feedback message states:

> For Production Rounds 1 and 2, you completed a total of Y letter search grids.
>
> [Concurrent condition: So far,] You have earned $0 USD for your output on the letter search task based on your goal to complete 11 letter search grids.

For participants in the *Piece-rate* condition, the feedback message states:

> For Production Rounds 1 and 2, you completed a total of Z letter search grids. You have earned $0.25 USD*Z for your output on the letter search task.

Participants in the *Concurrent* conditions learn their total earnings based on their *Task 1 Performance* after the end of production round 4, while participants in the Sequential conditions are reminded of their total earnings based on their *Task 1 Performance* during production rounds 1 and 2.

5.6 Dependent Variables and Process Variables

5.6.1 Dependent Variables

My four primary dependent variables include three measures of participants' affective reactions to performance feedback on the incentivized task (*Positive Affect, Negative Affect*, and *Total Affect*), and their performance on the unincentivized task (*Task 2 Performance*). To measure *Positive Affect* and *Negative Affect*, I employ a 7-point scale (from 1 (Strongly Disagree) to 7 (Strongly Agree)) using the Positive and Negative Affect Schedule (PANAS) (Watson et al. 1988).[64] I measure *Positive Affect* and *Negative Affect* by summing the reported scores for the 10 positive affect and 10 negative affect measures, respectively from the PANAS. Thus, each affect measure is out of a total of 70, with higher scores indicating stronger *Positive Affect* or *Negative Affect* (minimum score of 10 and maximum score of 70). I measure *Total Affect* by summing the *Positive Affect* and *Negative Affect* measures (minimum score of 20 and maximum score of 140).

To measure *Task 2 Performance*, I use the total number of decodes participants complete on Task 2.

5.6.2 Process Variables

Following prior literature, I also include measures for goal commitment (*Goal Commitment*) and self-efficacy (*Self-Efficacy*). Goal commitment is a key element of goal-setting theory, since without commitment to goal attainment, the presence of a goal is unlikely to induce increased effort (Locke 1968; Locke and Latham 2002). Therefore, in the *Goal* condition, I

[64] The original PANAS uses a 5-point scale (see Appendix D; Watson et al. 1988). A 7-point scale is used to measure affect in Blay et al. (2019) and Blay et al. (2012) to allow for greater potential variance in the responses. Thus, I employ a 7-point scale for my main study instrument.

expect that those who report greater commitment to the assigned goal will experience greater affective responses to feedback relative to those with lower goal commitment. For participants in the *Goal* condition, I measure *Goal Commitment* at the end of the comprehension quiz, just prior to beginning production round 1. *Goal Commitment* is based on summing the responses to four items with each using a 7-point Likert scale from 1 (Not at All) to 7 (Completely) (see Appendix I). The four-item measure is adopted from Klein et al. (2014) and has been used in prior research (Clements and Kamau 2018; Klein et al. 2020).

Self-efficacy is an important potential mediator between affect and effort (Gist and Mitchell 1992; Quintela 2005; Quintela and Donovan 2008). Empirical studies find that higher self-efficacy is positively associated with persistence or effort duration (Multon et al. 1991; Paglis and Green 2002). I measure *Self-Efficacy* immediately following the end of production round 4, prior to beginning the post-experimental questionnaire for purposes of analyzing whether efficacy beliefs mediate the relationship between affect and subsequent effort (*Task 2 Performance*). I adopt the New General Self-Efficacy (NGSE) scale from Chen et al. (2001) to measure *Self-Efficacy*, which consists of participants' responses to eight items using a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree) (see Appendix J).[65] I measure *Self-Efficacy* at the beginning of the post-experimental questionnaire rather than at the same time as measuring affect. I make this design choice to avoid removing participants from the production rounds for too long and potentially diminishing the strength of the affective responses to the

[65] Quintela (2005) employs a task specific self-efficacy (SSE) scale instead of a general self-efficacy scale because she is interested in the relationship between performance on one task relative to a goal and its influence on the self-set goal level for a second (different) task, which is better captured by the specific self-efficacy scale. In contrast, I am interested in looking at performance on the second task. Chen et al. (2001) find that NGSE scale is significantly positively related to SSE. Thus, the NGSE scale is appropriate for my setting.

performance feedback, which could prevent me from finding effort spillover effects should they exist.

5.7 Control and Other Measured Variables

Regarding task performance, those higher in ability are likely to outperform those lower in ability (Bonner and Sprinkle 2002). I measure *Task 1 Ability* and *Task 2 Ability* based on participants' performance on each task during the practice round. Prior studies employ unpaid practice round performance to measure task ability (e.g., Choi et al. 2021). Participants' performance is objectively calculated by the computer program used to administer my experiment for each task. Thus, when analyzing *Task 2 Performance* as dependent measures, I include *Task 2 Ability* as a covariate.

In the post-experimental questionnaire, I collect several demographic variables to allow me to evaluate successful random assignment of participants to each condition, including age, gender, highest level of education completed, country of residence, primary language, work experience (i.e., number of years of part-time and full-time employment), current employment status, number of hours spent on video and/or computer games. I also collect the demographic variables to determine if any variables should be included as covariates in the analyses because prior studies find that demographic variables, such as age and gender, are correlated with performance on real-effort tasks (e.g., Choi et al. 2021). Refer to Appendix K for the post-experimental questionnaire. Appendix L provides definitions of the variables of interest for my main study.

5.8 Summary

I employ a 2 x 2 between subjects experiment to test the effects of *Task 1 Contract Type* and *Task Temporality* on *Task 2 Performance*. The next chapter discusses the results of this experiment.

CHAPTER 6: MAIN STUDY RESULTS

6.1 Overview of Main Study Data

For the main study, I recruit a total of 600 MTurk participants. I recruit 100 participants for each piece-rate incentive (*Piece-rate)* condition, and 200 participants for each goal-based incentive (*Goal*) condition (assuming some participants attain and do not attain the assigned goals) to have sufficient power for the statistical analysis. Given that I predict ordinal interactions between *Task 1 Contract Type* and *Task Temporality* on affect and *Task 2 Performance*, larger sample sizes are needed because ordinal interactions tend to have smaller effect sizes compared to disordinal interactions (Bentley 2020).[66] I exclude 89 (15 percent) participant responses from the analyses because they did not complete the study, they gave more than two incorrect responses to one or more of the comprehension quiz questions, they did not meet the eligibility requirements, and/or they did not complete any letter search grids (i.e., Task 1). Therefore, I have a total of 511 participant responses to use in the analyses (182 in the *Piece-rate* condition, 329 in the *Goal* condition).[67] Table 5 presents the number of participants randomly assigned to each condition.

<< Insert Table 5 About Here >>

Participants earn an average of $4.97 USD for their participation in the study. Thus, on average, participants earn $1.97 USD in incentive compensation and $3.00 USD in fixed compensation. Participants spend an average of 24.3 minutes to complete the study. Thus, the average payment amount translates to $12.27 USD per hour, which is an appropriate wage for

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[66] Refer to Appendix L for all variable definitions.
[67] I exclude 6 participants from the *Piece-rate/Concurrent* condition, 12 participants from the *Piece-rate/Sequential* condition, 38 participants from the *Goal/Concurrent* condition, and 33 participants from the *Goal/Sequential* condition.

this participant group (Chen, Pesch, and Wang 2020). On average, participants are 40.5 years old and have 19.1 years of work experience. More than half of all participants (63.4 percent) have completed at least an undergraduate degree education level, and are female (50.5 percent of participants are female, 47.7 percent male, and 1.8 percent identify as non-binary or prefer not to disclose). Most participants (94.5 percent) are current residents of the United States with the remainder (5.5 percent) residing in Canada. On average, participants report spending 8.2 hours per week playing computer or video games. There are no significant differences in age, education, work experience, gender, or hours spent gaming among the four conditions (all p-values > 0.15). Thus, randomization of participants to condition appears to have been successful.

6.2 Test of Hypothesis 1

H1 predicts a main effect of *Task 1 Contract Type* on affect, such that employees' total affective responses to performance feedback (*Total Affect*) will be stronger when they are compensated with goal-based incentives rather than piece-rate incentives. H1 examines *Total Affect* as the dependent variable of interest. *Total Affect* consists of the sum of an individual's *Positive Affect* and *Negative Affect*. [68] While most studies examine positive and negative affect individually, more recent studies combine positive and negative affect (e.g., Lan et al. 2021).[69]

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[68] Preliminary analysis of the distribution of affective responses shows that both *Positive Affect* and *Negative Affect* are not normally distributed. The distribution of *Negative Affect* indicates that the data is skewed to the left (untabulated skewness = 1.04), with a high frequency of low *Negative Affect* reported. The distribution of *Positive Affect* indicates that the data is slightly skewed to the right (untabulated skewness = -0.76). Prior accounting studies measuring affect including, such as Blay et al. (2012), Blay et al. (2019), Kida et al. (2001), and Moreno et al. (2002), do not indicate the distribution of the affect measures, nor do these studies complete any data transformations of their affect measures. These studies employ similar 7-point scales for their affect measures, consistent with my study. I find only one paper in the management literature by Lan et al. (2021) that uses standardized affect scores in their study. Thus, I do not transform the data to adjust for the non-normality. Untabulated results suggest that the inferences remain the same regardless of whether I employ the original data or log transformed data.

[69] Lan et al. (2021) examine how the congruence/incongruence between positive affect and negative affect influence job satisfaction and counter-productive work behaviours. They compute the congruence/incongruence measure between positive and negative affect by multiplying the individual standardized affect scores together.

For the purposes of H1, I use the construct *Total Affect* to measure the overall affective response strength to performance feedback. Thus, higher reported *Positive Affect* and higher reported *Negative Affect* will both lead to greater overall *Total Affect*. Figure 6 presents the predicted main effect of *Task 1 Contract Type* on *Total Affect* for H1.

<< Insert Figure 6 About Here >>

Table 6 presents the correlation table between variables of interest for *Task 1 Contract Type*, including both the *Piece-rate* and *Goal* conditions. From the correlation analysis, I find that *Positive Affect* and *Negative Affect* are negatively correlated (r = -0.39, p-value < 0.01; two-tailed). This is consistent with the correlation that I find in my pilot study (r = -0.43), and that is found in prior research (e.g., Tellegen et al. 1999; Watson et al. 1999).[70] I also find a significant positive correlation between *Total Affect* and *Self-Efficacy* (r = 0.14, p-value < 0.01; two-tailed).[71] Because *Self-Efficacy* is measured post-experiment and is influenced by both the assigned condition and the experiences of participants during the experiment (e.g., their affective responses during the experiment, performance on each of the tasks, and the incentive amounts, if any, earned during the study), I do not include it as a covariate (Howell 2013).[72]

<< Insert Table 6 About Here >>

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[70] I also test whether *Total Affect* is correlated with the demographic variables (e.g., age, education, work experience, etc). Pairwise correlation analyses (not tabulated) reveal no significant associations (p > 0.10; two-tailed), therefore I do not include demographic variables as covariates in the analyses.

[71] I perform a confirmatory factor analysis (CFA) on the eight items that measure *Self-Efficacy* based on Chen et al. (2001) (refer to Appendix J). The untabulated model fit statistics suggest overall adequate model fit: CFI = 0.96, TLI = 0.95; SRMR = 0.02 (Hu and Bentler 1998; West et al. 2012). However, the RMSEA is above 0.10, which may indicate a poor model fit (Browne and Cudeck 1993). Generally, a CFI $\geq$ 0.95 indicates a good fit (Hu and Bentler 1998; West et al. 2012). A TLI $\geq$ .95 is commonly used as a criterion for the goodness of fit (Hu and Bentler 1998; West et al. 2012). RMSEA values less than 0.10 denote adequate model fit (Browne and Cudeck 1993). A SRMR < 0.08 indicates a good model fit (Hu and Bentler 1998).

[72] *Self-Efficacy* and *Task 1 Contract Type* are not independent because *Self-Efficacy* significantly differs across *Task 1 Contract Type*, such that *Self-Efficacy* is significantly greater under *Piece-rate* relative to *Goal* (untabulated: F = 15.27, p < 0.01; two-tailed). Follow up analysis reveals that the difference is primarily due to lower *Self-Efficacy* experienced by those in the *Goal* condition who fail to attain the goal, which suggests that *Self-Efficacy* is affected by participants' experiences during the study.

Panel A of Table 7 presents the descriptive statistics for the *Total Affect* scores for participants in the *Piece-rate* and *Goal* conditions. Consistent with H1, Panel A indicates that participants in the *Goal* condition report greater overall *Total Affect* (mean = 71.70) compared to participants in the *Piece-rate* condition (mean = 69.80). Panel B of Table 7 provides the results of a between subject analysis of variance (ANOVA) with *Total Affect* as the dependent variable, and *Task 1 Contract Type, Task Temporality,* and their interaction as the independent variables. Results in Panel B of Table 7 indicate that the difference in *Total Affect* between the *Goal* and the *Piece-rate* condition is marginally statistically significant (F = 2.33, p = 0.06; one-tailed).[73] Figure 7 presents the graphed means and visually confirms a main effect that is consistent with H1. Therefore, I find marginal support for H1, such that goal-based incentives lead to greater *Total Affect* than piece-rate incentives.[74]

<< Insert Table 7 About Here >>

<< Insert Figure 7 About Here >>

6.3 Test of Hypothesis 2

H2 posits that the positive effect of *Goal* incentives compared to *Piece-rate* incentives on *Total Affect*, will be greater in the *Sequential* versus *Concurrent* temporality condition. Thus, I expect that *Task Temporality* will moderate the effect of *Task 1 Contract Type* on *Total Affect*.

[73] The F-test is reported as one-tailed because the result is directionally consistent with the prediction and is consistent with the t-test result.

[74] Inconsistent with goal-setting theory, I do not find that the *Goal* condition has significantly greater *Task 1 Performance* relative to the *Piece-rate* condition (untabulated: F = 0.06, p-value = 0.80; two-tailed), controlling for *Task 1 Ability* (Latham and Locke 2007). However, I confirm that *Task 1 Performance* is greater for participants in the *Goal* condition who attain the goal compared to the *Piece-rate* condition (untabulated: F = 34.38, p-value < 0.01; two-tailed), controlling for *Task 1 Ability*. I also find that *Task 1 Performance* is significantly lower for those in the *Goal* condition who do not attain the goal compared to the *Piece-rate* condition (untabulated: F = 35.51, p-value < 0.01; two-tailed).

Figure 6 summarizes the predictions for H2, which shows an ordinal interaction between *Task 1 Contract Type* and *Task Temporality* on *Total Affect*.

The descriptive statistics presented in Panel A of Table 7 indicate that *Total Affect* is greater for the *Goal* incentive under *Sequential* temporality condition (mean = 70.84) compared to *Total Affect* for the *Piece-rate* incentive under *Sequential* temporality condition (mean = 69.56), consistent with expectations. Under *Concurrent* temporality, *Total Affect* is greater under the *Goal* (mean = 72.59) relative to the *Piece-rate* condition (mean = 70.03). Figure 7 presents the graphed means and suggests an ordinal interaction. However, inconsistent with H2, Figure 7 shows that the difference in *Total Affect* between the two incentive conditions is greater under *Concurrent* versus *Sequential* temporality.

The ANOVA results presented in Panel B of Table 7 show an insignificant interaction between *Task 1 Contract Type* and *Task Temporality* on *Total Affect* ($F = 0.26$, $p = 0.61$; two-tailed). Given that I predict an ordinal *Task 1 Contract Type* x *Task Temporality* interaction, planned contrasts represent the appropriate test rather than an ANOVA (Buckless and Ravenscroft 1990; Keppel 1991).[75] However, because the visual fit of the graphed means presented in Figure 7 is not consistent with H2, I do not proceed with a planned contrast analysis (Guggenmos et al. 2018). Therefore, I do not find support for H2, such that *Task Temporality* does not moderate the effect of *Task 1 Contract Type* on *Total Affect*. This finding suggests that the strength of the affective reaction to performance feedback is similar whether the feedback is about goal attainment or failure, or about goal progress.

[75] "Using the main and interaction effects of ANOVA to explain the pattern of relationships (interactions) among cell means is appropriate only when the pattern hypothesized is testable by the conventional ANOVA (i.e., disordinal relationship) and no variable has more than two levels" (Buckless and Ravenscroft 1990: 934).

6.4 Test of Hypothesis 3a and 3b

H3a (H3b) predicts that employees working under *Sequential* temporality in the *Goal* condition who attain (fail to attain) the performance goal on Task 1 will have the greatest (lowest) *Task 2 Performance*, relative to all other conditions. This effort spillover effect onto Task 2 occurs because the positive (negative) response to the feedback on *Task 1 Performance,* following goal attainment (failure) is expected to be stronger under the *Goal* condition compared to the *Piece-rate* condition. Therefore, the analyses for H3a and H3b examine *Feedback Direction* and *Task Temporality,* as the independent variables of interest, where *Feedback Direction* includes participants in the *Goal* condition nested in terms of goal attainment (i.e., those who attain versus do not attain the assigned goal), and the *Piece-rate* condition. H3a and H3b examine performance on the unincentivized decode task (*Task 2 Performance)* as the dependent variable of interest.

Based on my predicted model presented in Figure 1, *Positive Affect* following feedback on *Task 1 Performance* should increase *Task 2 Performance* (i.e., positive effort spillover), while *Negative Affect* following feedback on *Task 1 Performance* should decrease T*ask 2 Performance* (i.e., negative effort spillover). From the correlation table presented in Table 6, I find a significant positive correlation between *Positive Affect* and *Task 2 Performance* ($r = 0.16$, $p < 0.01$; two-tailed), consistent with my expectation. Inconsistent with my expectation, I find an insignificant negative correlation between *Negative Affect* and *Task 2 Performance* ($r = -0.06$, $p = 0.21$; two-tailed). The correlation table presented in Table 6 also shows that *Task 2 Ability* is significantly positively correlated with *Task 2 Performance* ($r = 0.47$, $p < 0.01$; two-tailed).[76]

[76] The significant correlation between *Task 2 Ability* and *Task 2 Performance* supports using task performance on the practice rounds as an appropriate measure of task ability. I also test whether *Task 2 Performance* is correlated with the demographic variables (e.g., age, education, work experience, etc). Pairwise correlation analysis reveals a significant association, between *Task 2 Performance* and participant's age (not tabulated: $r = -0.16$, $p < 0.01$; two-

Follow-up analysis indicates that *Task 2 Ability* significantly differs across the *Goal* condition between participants who attain the goal versus those that do not attain the goal (untabulated: $F = 23.88$, $p < 0.01$; two-tailed).[77] This result is consistent with the significant positive correlation found between *Task 1 Ability* and *Task 2 Ability* ($r = 0.39$, $p < 0.01$; two-tailed). The significant correlation between ability on the two tasks suggests participants that are inherently better at performing Task 2 are also more likely to attain the assigned performance goal on Task 1 relative to those who do not attain the assigned goal on Task 1.[78] Thus, it is important to control for *Task 2 Ability*, when testing for the effort spillover effect predicted by H3a and H3b.

To determine if collinearity issues occur when both *Feedback Direction* and *Task 2 Ability* are included in the model, I calculate the variance inflation factors (VIFs), which measure the strength of the correlations between the explanatory variables in my model (Hair et al. 2010). Untabulated results confirm that collinearity is not an issue, with all VIFs less than 4, which are below limit values (Hair et al. 2010). Therefore, I include *Task 2 Ability* as a covariate in the analysis to isolate the effects of effort spillover on *Task 2 Performance* from participants' inherent ability on that task (Howell 2013).

H3a predicts that *Task 2 Performance* will be greatest for participants in the *Goal* under *Sequential* temporality condition who attain the goal relative to all other conditions, as shown in Figure 8. Because H3a examines the positive effort spillover effects onto Task 2 following positive feedback on *Task 1 Performance,* I exclude participants who do not attain the goal from

tailed) and average hours per week spent playing video and/or computer games (not tabulated: $r = 0.08$, $p = 0.06$; two-tailed). Including these demographics variables as covariates does not change my results, nor are there significant associations found in the ANOVA ($p > 0.10$). Therefore, I do not include them as covariates.

[77] I find that *Task 2 Ability* and *Task Temporality* are independent (untabulated: $F = 0.15$, $p = 0.70$; two-tailed).

[78] Additional analysis reveals that *Task 2* Ability and *Task 1 Contract Type* are independent (untabulated: $F = 0.10$, $p = 0.75$; two-tailed). Therefore, I find no inherent differences in ability between participants randomly assigned to the *Piece-rate* condition and those randomly assigned to the *Goal* condition, confirming that random assignment of participants to condition was successful with respect to *Task 2 Ability*.

the H3a analysis. Table 8 presents the results for testing H3a. Panel A of Table 8 provides descriptive statistics for the average number of decodes completed (i.e., *Task 2 Performance*) by condition. The descriptive results indicate that participants in the *Goal* condition who attain the assigned goal and work under *Sequential* temporality achieve the highest *Task 2 Performance* (adjusted mean = 47.20), relative to those in the *Piece-rate*/*Sequential* (adjusted mean = 44.26), the *Piece-rate*/*Concurrent* (adjusted mean = 44.78), and those in the *Goal/Concurrent* condition who attain the goal (adjusted mean = 44.39). [79] This pattern of results is consistent with H3a. Figure 9 presents the graphed adjusted means for participants in the *Goa*l conditions who attain the goal, and the *Piece-rate* conditions for each *Task Temporality* condition.

<< *Insert Figure 8 About Here* >>

<< *Insert Table 8 About Here* >>

I conduct a 2 x 2 analysis of covariance (ANCOVA), with *Feedback Direction* (*Piece-rate* versus *Goal* who attain the goal) and *Task Temporality* (*Concurrent* versus *Sequential*) as the independent variables and *Task 2 Performance* as the dependent variable. I include *Task 2 Ability* as the covariate. The ANCOVA results in Panel B of Table 8 reveal an insignificant main effect of *Feedback Direction* (F = 1.08, p = 0.30; two-tailed), an insignificant main effect of *Task Temporality* (F = 0.90, p = 0.34; two-tailed), and an insignificant *Feedback Direction* x *Task Temporality* interaction (F = 1.90, p = 0.17; two-tailed).[80] However, given that an ordinal interaction is predicted, and the specific nature of the *Feedback Direction* x *Task Temporality*

[79] All adjusted means reported are adjusted for the covariate included in the analysis.
[80] I also conduct an ANCOVA including all two- and three-way interactions involving *Task 2 Ability*, which were found to be insignificant (all p-values > 0.34; two-tailed). Therefore, because the interactions are all insignificant, I exclude them for simplicity.

interaction is hypothesized, planned contrasts represent the appropriate test for H3a rather than analysis of variance (Buckless and Ravenscroft 1990; Keppel 1991).

Guggenmos et al. (2018) propose a three-step approach to contrast coding. Following Guggenmos et al. (2018), I first check the visual fit of the observed data shown in Figure 9 and compare it to the predicted pattern presented in Figure 8. Overall, the visual fit of the data is consistent with the pattern of results predicted by H3a; *Task 2 Performance* appears greatest for participants in the *Goal*/*Sequential* condition who attain the goal relative to the other three conditions. Thus, a planned contrast analysis is appropriate to test H3a. Second, I use a contrast test to determine the significance of the predicted pattern of results. Given the prediction in H3a, I use the following contrast coding: *Piece-rate/Concurrent* (-1), *Piece-rate/Sequential* (-1), *Goal/Concurrent* who attain the goal (-1), *Goal/Sequential* who attain the goal (+3).[81] Consistent with H3a, the planned contrast test, presented in Panel C of Table 8, reveals a significant ordinal interaction between *Feedback Direction* and *Task Temporality,* such that the participants in the *Goal* under *Sequential* temporality condition who attain the goal have significantly greater *Task 2 Performance* compared to those in the *Piece-rate* conditions (including both *Concurrent* and *Sequential* temporality) and those in the *Goal* under *Concurrent* temporality condition who attain the goal (Contrast 1: $t = 1.93$, $p = 0.03$; one-tailed). Therefore, the planned contrast supports H3a.[82] Following the third-step for the Guggenmos et al. (2018) approach to contrast coding, I calculate the contrast variance residual (q^2), which quantifies the variance that is unexplained by

[81] I do not predict a difference in the *Task 2 Performance* for participants in the *Goal/Concurrent* condition who attain the goal compared to those in either of the two *Piece-rate* conditions. This is because participants in the *Goal/Concurrent* condition who attain the goal receive performance feedback after completing two rounds of Task 1 and Task 2, and do not necessarily know if they have attained or will attain the goal while working on Task 2. Therefore, the predicted effort spillover effects may or may not occur in the *Concurrent* condition.

[82] In an additional test, I confirm that *Task 2 Performance* is marginally significantly greater for participants in the *Goal*/*Sequential* condition who attain the goal versus those in the *Goal*/*Concurrent* condition who attain the goal (untabulated: $t = 1.46$, p-value = 0.07; one-tailed).

the contrast.[83] I find that the contrast variance residual is 2.6% (untabulated), which indicates that most of the variance is explained by the contrast. In addition, I find that the model contrast is significant (untabulated: $F = 3.86$, $p = 0.05$; two-tailed). Together, these findings indicate that the planned contrasts are appropriate for my data and the results support H3a. The results of the contrast coding show that participants working under *Sequential* temporality in the *Goal* condition who attain the performance goal on Task 1 have the greatest *Task 2 Performance,* relative to all other conditions.

<< Insert Figure 9 About Here >>

H3b predicts that *Task 2 Performance* will be lowest for participants in the *Goal* condition under *Sequential* temporality who do not attain the goal relative to all other conditions, as shown in Figure 10. Because H3b examines the negative effort spillover effects onto Task 2 following feedback on *Task 1 Performance,* I exclude participants in the *Goal* condition who attain the goal from the H3b analysis. Panel A of Table 9 presents the descriptive statistics for participants in the *Goal* condition who do not attain the goal and the *Piece-rate* condition for each *Task Temporality* condition. Inconsistent with H3b, I do not find that *Task 2 Performance* is lowest for those in the *Goal/Sequential* condition who do not attain the goal (adjusted mean = 41.17) compared to those in the *Goal/Concurrent* condition who do not attain the goal (adjusted mean = 40.82). However, I do find that *Task 2 Performance* is lower for those in the *Goal/Sequential* condition who do not attain the goal compared to participants in the *Piece-rate*/*Concurrent* condition (adjusted mean = 43.21), and the *Piece-rate* /*Sequential* condition (adjusted mean = 42.72). Figure 11 presents the graphed adjusted means.

[83] The contrast variance residual calculation is used to quantify the variance "related to any other potential effects present in the data (i.e., besides the contrast effect) as a function of the totality of variance that could have been explained" (Guggenmos et al. 2018: 227).

<< Insert Figure 10 About Here >>

<< Insert Table 9 About Here >>

<< Insert Figure 11 About Here >>

I conduct a 2 x 2 ANCOVA, with *Feedback Direction* (*Piece-rate* versus *Goal* who do not attain the goal) and *Task Temporality (Concurrent* versus *Sequential)* as the independent variables, and *Task 2 Performance* as the dependent variable. I include *Task 2 Ability* as the covariate. Panel B of Table 9 shows the results of the ANCOVA. I find a marginally significant main effect of *Feedback Direction*, such that participants in the *Goal* condition who do not attain the goal have lower *Task 2 Performance* compared to those in the *Piece-rate* condition (F = 3.41, p = 0.07; two-tailed). I find an insignificant main effect of *Task Temporality* (F = 0.00, p = 0.95; two-tailed), and an insignificant *Task Temporality x Task Temporality* interaction (F = 0.16, p-value = 0.69; two-tailed).[84] Similar to H3a, planned contrasts represent the appropriate test rather than an ANCOVA to test H3b. However, the graphed means presented in Figure 11 indicate a poor visual fit between my predicted and actual results (Guggenmos et al. 2018). Therefore, I do not continue with planned contrast testing. Overall, the findings for H3b indicate that goal failure on one task does have a marginally significant negative effort spillover effect onto another task.

[84] I also run the ANCOVA with the interaction between *Task 2 Ability* and *Feedback Direction*, the *Task 2 Ability* and *Task Temporality* interaction, and the three-way interaction of *Task 2 Ability, Feedback Direction*, and *Task Temporality* included in the model. When these interactions are included in the model, the main effect of *Feedback Direction* becomes insignificant (untabulated: F = 1.48; p-value = 0.23; two-tailed), with a significant *Task Temporality x Task 2 Ability* interaction (untabulated: F = 5.40, p-value = 0.02; two-tailed). I determine that the *Feedback Direction x Task 2 Ability* interaction is insignificant (untabulated: F = 0.10, p-value = 0.75; two-tailed), as is the *Feedback Direction* x *Task Temporality x Task 2 Ability* interaction (untabulated: F = 0.09, p-value = 0.76; two-tailed). This conservative model impacts the degrees of freedom, causing the marginal significant main effect on *Feedback Direction* to become insignificant.

However, inconsistent with my theory, I do not find support that *Task Temporality* moderates this effect, as predicted in H3b.

6.5 Supplemental Analyses

6.5.1 H1 Supplemental Analyses

H1 Supplemental Test 1: The Effect of Task 1 Contract Type on Positive Affect and Negative Affect

Because I find marginal support for H1 from the main analysis, I conduct supplemental analyses to examine whether there are differences in *Positive Affect* and/or *Negative Affect* between *Task 1 Contract Type*. This allows me to determine if the marginally significant difference in *Total Affect* between the *Goal* condition and the *Piece-rate* condition found for H1 is driven by differences in *Positive Affect*, *Negative Affect*, or both. I conduct a 2 x 2 x (2) mixed factorial ANOVA, where *Task 1 Contract Type* (*Piece-rate* versus *Goal*) and *Task Temporality* (*Concurrent* versus *Sequential*) are the between subject variables, and *Affect Type* is a within subject variable using my separate measures for *Positive Affect* and *Negative Affect*. Because *Positive Affect* and *Negative Affect* are both measured for each participant, a mixed factorial ANOVA allows me to partition out within-participant variability in the two affect measures and determine if differences in *Positive Affect* and *Negative Affect* exist between *Task 1 Contract Type* (Howell 2013). Panel A of Table 10 presents the descriptive statistics for *Positive Affect* by *Task 1 Contract Type* and indicates that *Positive Affect* is greater for the *Piece-rate* condition (mean = 52.54) compared to the *Goal* condition (mean = 47.25). Panel B of Table 10 presents the descriptive statistics for *Negative Affect* by *Task 1 Contract Type* and indicates that *Negative Affect* is greater for the *Goal* condition (mean = 24.46) compared to the *Piece-rate* condition (mean = 17.26). Panel C of Table 10 presents the results of the mixed factorial ANOVA. I find a marginally significant main effect of *Task 1 Contract Type* (F = 2.28, p = 0.06; one-tailed), indicating there are significant differences between the *Piece-rate* and *Goal* conditions for average (total) affect across *Positive Affect* and *Negative Affect*, consistent with my prediction for H1.[85] I also find significant within-subject differences in the values of *Positive Affect* and *Negative Affect* (*Affect Type*) (F = 1027.28, p-value < 0.01; two-tailed). The within subject main effect of *Affect Type* is qualified by a significant *Task 1 Contract Type* x *Affect Type* interaction (F = 47.73, p-value < 0.01; two-tailed).[86] No significant between subject or within subject main effects or interactive effects are found for *Task Temporality* (all p-values $\geq$ 0.38; two-tailed). To further analyze the significant effect of *Task 1 Contract Type on* the average affect across *Positive Affect* and *Negative Affect*, I conduct pairwise comparisons on *Positive Affect* and *Negative Affect* between *Piece-rate* and *Goal* conditions, respectively. Panel D and Panel E of Table 10 present the post-ANOVA pairwise comparisons for the supplemental test for H1. The results in Panel D show that *Positive Affect* is significantly greater for participants in the *Piece-rate* condition compared to the *Goal* condition (Comparison 1: t = 4.93, p-value < 0.01; two-tailed), which is not directionally consistent with H1. The results in Panel E indicate that *Negative Affect* is significantly greater for participants in the *Goal* condition versus the *Piece-rate* condition (Comparison 2: t = 7.28, p-value < 0.01; one-tailed), which is consistent with H1. Therefore, I find that overall, goal-based incentives induce greater *Negative Affect*, and lower *Positive Affect*, relative to piece-rate incentives.

<< Insert Table 10 About Here >>

[85] The F-test is reported as one-tailed because the result is directionally consistent with the prediction and is consistent with the t-test result.
[86] *Affect Type* distinguishes between *Positive Affect* and *Negative Affect*.

H1 Supplemental Test 2: The Effect of Feedback Type on Positive Affect and Negative Affect

To further understand the differences in *Positive Affect* and *Negative Affect* by *Task 1 Contract Type*, I distinguish between participants assigned to the *Goal* condition who attain and do not attain the goal. First, I conduct a 3 x 2 ANOVA with *Feedback Direction (Piece-rate* versus *Goal* who attain the goal versus *Goal* who do not attain the goal*)* and *Task Temporality* (*Concurrent* versus *Sequential*) as the independent variables and *Positive Affect* as the dependent variable. Based on H1, I expect that participants working under the *Goal* condition who attain the goal should experience greater *Positive Affect* in response to their feedback relative to those working under the *Piece-rate* condition, and relative to those under the *Goal* condition who do not attain the goal.

Panel A of Table 11 presents the descriptives for *Positive Affect* based on *Feedback Direction* and show that *Positive Affect* is not greater for participants in the *Goal* condition who attain the goal (mean = 51.97) relative to the *Piece-rate* condition (mean = 52.54), which is inconsistent with my expectation. However, consistent with expectations, I do find that the reported *Positive Affect* is greater for participants in the *Piece-rate* condition versus those in the *Goal* condition who do not attain the goal (mean = 42.82). Panel B of Table 11 presents the results of the ANOVA, which shows a significant main effect of *Feedback Direction* on *Positive Affect* ($F = 37.48$, p-value < 0.01; two-tailed), qualified by a marginally significant *Feedback Direction x Task Temporality* interaction ($F = 2.32$, p-value $= 0.10$; two-tailed). Panel C of Table 11 presents the post-ANOVA pairwise comparisons between the four conditions.[87] Inconsistent with H1, I do not find a significant difference in *Positive Affect* between participants in the *Goal*

[87] I adjust for multiple pairwise comparisons using the Tukey test, which is more powerful than the Bonferroni test when comparing a large number of means (Howell 2013).

condition who attain the goal and the *Piece-rate* condition under *Concurrent* temporality (Comparison 1: t = -0.35, p-value = 1.00; two-tailed) nor under *Sequential* temporality (Comparison 4: t = -0.32, p-value = 1.00; two-tailed). However, I do find that *Positive Affect* is significantly greater for participants working under *Piece-rate* incentives versus *Goal* incentives who do not attain the goal under *Concurrent* temporality (Comparison 3: t = 4.25, p-value < 0.01; two-tailed) and *Sequential* temporality (Comparison 6: t = 6.80, p-value < 0.01; two-tailed). I also find that *Positive Affect* is significantly greater for participants in the *Goal* condition who attain the goal versus participants in the *Goal* condition who do not attain the goal under *Concurrent* temporality (Comparison 2: t = 3.69, p-value < 0.01; two-tailed), and, consistent with expectation, under *Sequential* temporality (Comparison 5: t = 6.38, p-value < 0.01; one-tailed). Overall, the results of the supplemental test fail to confirm a significant difference in the strength of the positive affective reaction to feedback for participants working under goal-based incentives who attain the goal-based versus those earning piece-rate incentives.

<< Insert Table 11 About Here >>

Second, I conduct a 3x2 ANOVA with *Feedback Direction* and *Task Temporality* as the independent variables, and *Negative Affect* as the dependent variable. Based on the theory for H1, I expect that participants working under the *Goal* incentive who do not attain the goal will experience greater *Negative Affect*, relative to those working under *Piece-rate* incentives, and relative to those under the *Goal* condition who attain the goal.

Panel A of Table 12 presents the *Negative Affect* descriptives based on *Feedback Direction.* As expected, *Negative Affect* is greater for participants in the *Goal* condition who do not attain the goal (mean = 27.75) compared to the *Piece-rate* condition (mean = 17.26) and the *Goal* condition who attain the goal (mean = 20.94). Panel B of Table 12 presents the ANOVA results and confirms a significant main effect of *Feedback Direction* on *Negative Affect* (F = 40.14, p-value < 0.01; two-tailed) qualified by a significant *Feedback Direction x Task Temporality* interaction (F = 8.73, p-value < 0.01; two-tailed). I find an insignificant main effect of *Task Temporality* (F = 0.64, p-value = 0.42; two-tailed). Post-ANOVA pairwise comparisons presented in Panel C of Table 12 reveal that *Negative Affect* is significantly greater for participants in the *Goal* condition who do not attain the goal compared to the *Piece-rate* condition under *Concurrent* temporality (Comparison 1: t = 4.55, p-value < 0.01; one-tailed). Consistent with my expectation, I find that *Negative Affect* is significantly greater for participants in the *Goal* condition who do not attain the goal relative to the *Piece-rate* condition under *Sequential* temporality (Comparison 4: t = 7.97, p-value < 0.01; one-tailed). While I find a significant difference in *Negative Affect* between participants in the *Goal* condition who do not attain the goal versus those in the *Goal* condition who do attain the goal under *Sequential* temporality (Comparison 5: t = 6.86, p-value < 0.01; one-tailed), I do not find a significant difference between participants in the *Goal* condition who do not attain the goal compared to those in the *Goal* condition who do attain the goal under *Concurrent* temporality (Comparison 2: t = 0.93, p-value = 0.94; two-tailed). The post-ANOVA pairwise comparisons also reveal that *Negative Affect* is significantly greater for those in the *Goal* condition who attain the goal compared to the *Piece-rate* condition under *Concurrent* temporality (Comparison 3: t = 3.46, p-value < 0.01; two-tailed), but not significantly greater for participants in the *Goal* condition who attain the goal versus the *Piece-rate* condition under *Sequential* temporality (Comparison 6: t = 1.01, p-value = 0.91; two-tailed). The results of the supplemental test confirm a significant difference in the strength of the negative affective reaction between participants working under goal-based incentives who do not attain the goal and those earning piece-rate incentives.

<< Insert Table 12 About Here >>

Overall, the results from the supplemental analyses for H1 confirm that the marginally significant difference in *Total Affect* between the *Goal* and *Piece-rate* condition found in Table 10, while largely driven by the *Negative Affect* experienced by participants who do not attain the goal, is also due to greater *Negative Affect* experienced by participants that do attain the goal under *Concurrent* temporality. This finding is consistent with prior literature, which suggests that, in general, individuals working towards performance goals experience greater negative affective feelings, such as fear and nervousness, relative to individuals with no specific goal (Carver and Scheier 1990; Latham and Locke 2007). Specifically, based on my pairwise comparisons presented in Panel C, Table 12, I find that participants who attain the goal experience greater *Negative Affect* when working under *Concurrent* versus *Sequential* temporality (Comparison 9: $t = 3.17$, p-value $= 0.01$; one-tailed). This result confirms that participants working under goal-based incentives experience significantly greater negative affect relative to piece-rate incentives until the performance feedback confirms goal attainment causing a decrease in negative affect (i.e., an insignificant difference in negative affect between the *Goal*/*Sequential* condition and the *Piece-rate*/*Sequential* condition).

The results of the supplemental analysis partially support the theory for H1. Consistent with my theory for H1, I find support that participants in the *Goal* condition who do not attain the goal experience greater *Negative Affect* relative to those in the *Piece-rate* condition. However, inconsistent with H1, I do not find support that those in the *Goal* condition who attain the goal experience greater *Positive Affect* compared to those in the *Piece-rate* condition. Instead, I find that participants working under piece-rate and goal-based incentives experience similar positive affective responses when the goal is attained. I also find that participants working under goal-based incentives experience greater negative affect relative to those working under piece-rate incentives, whether the goal is attained or not, when the tasks are performed under concurrent multitasking. Together, these findings suggest that there may be greater negative consequences (due to greater negative affect) to employing goal-based incentives, without greater positive consequences (from greater positive affect following goal attainment) relative to piece-rate incentives.

H1 Supplemental Test 3: The Effect of Goal Commitment on Positive and Negative Affect

For the third supplemental analysis for H1, I examine whether the level of commitment to the assigned goal (*Goal Commitment*) for the *Goal* condition explains differences in the *Positive Affect* and *Negative Affect* experienced by participants based on *Feedback Direction*.[88] Goal-setting theory argues that high goal commitment is necessary for a goal to induce positive motivational effects (Locke and Latham 2002). Consistent with goal-setting theory, I expect that participants with higher goal commitment will experience greater positive (negative) affect following goal attainment (failure) relative to those with lower goal commitment. Thus, I expect a significant *Affect Type x Goal Commitment x Feedback Direction* interaction.

To analyze the relationship between *Goal Commitment* and affect, I split participants in the *Goal* condition into *High Goal Commitment* and *Low Goal Commitment.* [89] I conduct a 2 x 2 x (2) mixed factorial ANCOVA with *Goal Commitment* and *Feedback Direction* as the between subject variables, and *Positive Affect* and *Negative Affect* as the within-subject variables.[90] I

[88] I perform a confirmatory factor analysis (CFA) on the four items that measure *Goal Commitment* based on Klein et al. (2014) (refer to Appendix I). The untabulated model fit statistics suggest a good model fit: CFI > 0.99, TLI = 0.99; RMSEA = 0.08, SRMR = 0.01 (Browne and Cudeck 1993; Hu and Bentler 1998; West et al. 2012).

[89] I define *High Goal Commitment* as participants with scores above the mean *Goal Commitment* score (i.e., a score equal to or greater than 26), and *Low Goal Commitment* as those with scores below the mean *Goal Commitment* score (i.e., a score less than 26).

[90] I also ran a 2 x 2 x (2) mixed factorial ANOVA, including *Task Temporality* as a between subject factor; *Task Temporality* does not have any significant main effect or interactive effects on affect. Therefore, to simplify the results, I exclude *Task Temporality* as a factor in the analysis.

include *Task 1 Ability* as a covariate to control for the impact of differences in ability on *Goal Commitment* and subsequently on *Positive Affect* and *Negative Affect (*Locke and Latham 2002). Panel A of Table 13 provides the descriptives for *Positive Affect* for participants with *High Goal Commitment* and *Low Goal Commitment*. Participants with *High Goal Commitment* report higher *Positive Affect (*adjusted mean = 51.71) relative to those with *Low Goal Commitment* (adjusted mean = 41.92), across *Feedback Direction*. For participants who attain the goal, *Positive Affect* is higher for those with *High Goal Commitment* (adjusted mean = 56.05) versus *Low Goal Commitment* (adjusted mean = 47.57). Panel B of Table 13 provides the descriptives for *Negative Affect* for participants with *High Goal Commitment* and *Low Goal Commitment*. Participants with *High Goal Commitment* do not report lower *Negative Affect (*adjusted mean = 23.83) relative to those with *Low Goal Commitment* (adjusted mean = 25.30), across *Feedback Direction*. From the descriptives, for participants who do not attain the goal, those with *High Goal Commitment* do not experience greater *Negative Affect* (adjusted mean = 27.68) compared to participants with *Low Goal Commitment* (adjusted mean = 28.99).

<< Insert Table 13 About Here >>

Panel C of Table 13 presents the results of the mixed factorial ANCOVA. I confirm a significant main effect of *Goal Commitment* (F = 9.10, p-value < 0.01; two-tailed), and a significant main effect of *Affect Type* (F = 125.89, p-value <0.01; two-tailed). These main effects are qualified by a significant *Affect Type x Goal Commitment* interaction (F = 4.81, p-value = 0.03; two-tailed). While I do not find a significant main effect of *Feedback Direction* (F = 0.37, p-value = 0.55; two-tailed), I find a significant *Affect Type x Feedback Direction* interaction (F = 10.58, p-value < 0.01; two-tailed). Inconsistent with my expectations, the *Affect Type x Goal Commitment x Feedback Direction* interaction is insignificant (F = 0.00, p-value = 0.95; two-tailed), as well as all other interactions (all p-values > 0.23; two-tailed). Panel D and Panel E of Table 13 presents the post-ANCOVA pairwise comparisons between *High Goal Commitment* and *Low Goal Commitment* on *Positive Affect* and *Negative Affect*, respectively. I find that participants with *High Goal Commitment* report significantly greater *Positive Affect* relative to those with *Low Goal Commitment* (Comparison 1: t = 7.15, p-value < 0.01; one-tailed). However, I find no significant difference in *Negative Affect* between *High Goal Commitment* and *Low Goal Commitment* (Comparison 2: t = 0.99, p-value = 0.32; two-tailed).[91] Therefore, it appears that *Goal Commitment* increases the *Positive Affect* experienced by participants but does not decrease the amount of *Negative Affect* experienced by participants working under goal-based incentives.[92] Overall, while I do not find a significant interaction between *Goal Commitment* and *Feedback Direction* on *Positive Affect* and *Negative Affect*, I do find that *Goal Commitment* impacts the level of *Positive Affect* experienced.

6.5.2 H2 Supplemental Analyses

Based on my main analysis for H2, I do not find evidence that performance feedback about goal attainment or failure (i.e., *Sequential* task temporality) leads to greater *Total Affect* relative to performance feedback about goal progress (i.e., *Concurrent* temporality).

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[91] If I use a continuous measure for goal commitment, I find that goal commitment is significantly, positively associated with *Positive Affect* (untabulated: t = 8.91, p-value < 0.01; two-tailed) and is insignificantly associated with *Negative Affect* (untabulated: t = -1.32, p-value = 0.19; two-tailed), controlling for *Task 1 Ability*. Therefore, the results are consistent with the findings above.

[92] I also ran additional supplemental analyses for H1 to determine if the difference between actual performance on Task 1 and the assigned goal (i.e, distance from the goal) impacts the strength of the positive or negative affective response to performance feedback. According to Locke and Latham (2002), feedback is necessary for people to assess their performance relative to a goal and adjust the level and/or direction of their effort as necessary to ensure goal attainment. In my study, participants who perform significantly above (below) the performance goal (i.e., high positive goal distance or high negative goal distance) will have greater certainty that they will (not) attain the assigned goal prior to receiving the feedback message, and thus, may not experience significant affective responses to the feedback message relative to those who have a smaller positive or negative goal distance. However, I do not find any significant effects of goal distance on positive or negative affect (untabulated, all p-values > 0.10).

As a supplemental analysis for H2, I examine whether *Task Temporality* moderates the effect of *Feedback Direction* on *Affect Type*. It is possible that because I do not distinguish participants in the goal-based condition based on goal attainment in the analysis for H2, it may be more difficult to capture the moderating effect of *Task Temporality* on affective responses, should it exist. This is because the greater *Negative Affect* and lower *Positive Affect* that I expect for participants who fail to attain the goal under *Sequential* temporality, may be cancelled out by the greater *Positive Affect* and lower *Negative Affect* that I expect for those who attain the goal in the *Sequential* temporality condition.

H2 Supplemental Test 1: The Moderating Effect of Task Temporality on Positive Affect

Table 11 (Panel B) presents the results of a 3x2 ANOVA to evaluate whether *Task Temporality* moderates the effects of *Feedback Direction* on the strength of the *Positive Affect* for participants in the *Goal* condition who attain the goal relative to the *Piece-rate* condition. I expect that under *Sequential* temporality, participants in the *Goal* condition who attain the goal will experience greater *Positive Affect* relative to the *Piece-rate* condition because they receive performance feedback confirming that they have attained the goal and will earn the goal-based incentive. Thus, I also expect that *Positive Affect* should be greater for those in the *Goal* condition who attain the goal under *Sequential* temporality versus *Concurrent* temporality. Finally, I expect that *Positive Affect* should be lower for participants in the *Goal* condition who do not attain the goal under *Sequential* temporality versus *Concurrent* temporality because they receive performance feedback confirming that they have not attained the goal and will not receive the goal-based incentive.

The descriptives presented in Panel A of Table 11 indicate that *Positive Affect* is greater for participants in the *Goal* condition who attain the goal under the *Sequential* temporality condition (mean = 52.43) than the *Concurrent* temporality condition (mean = 51.47), as expected. *Positive Affect* is also greater for those in the *Piece-rate* condition under *Sequential* temporality (mean = 53.01) versus *Concurrent* temporality (mean = 52.11). Also as expected, the participants in the *Goal* condition who do not attain the goal report lower *Positive Affect* under the *Sequential* temporality (mean = 40.90) than in the *Concurrent* temporality condition (mean = 44.70). Panel B of Table 11 confirms a marginally significant *Feedback Direction x Task Temporality* interaction (F = 2.32, p-value = 0.10; two-tailed) that qualifies the significant main effect of *Feedback Direction* on *Positive Affect*.

Post-ANOVA tests presented in Panel C of Table 11 reveal that the difference in *Positive Affect* between the participants in the *Goal* condition who attain the goal under *Sequential* temporality versus *Concurrent* temporality is not significant (Comparison 8: t = 0.52, p-value = 0.50; one-tailed).[93] This is inconsistent with my expectations. I also do not find a significant difference in *Positive Affect* between the participants in the *Goal* condition who attain the goal under *Sequential* temporality and the *Piece-rate* condition under *Sequential* temporality (Comparison 4: t = -0.32, p-value = 1.00; two-tailed).

Additional pairwise comparisons presented in Panel C of Table 11 reveal that the marginally significant *Feedback Direction x Task Temporality* interaction is due to participants in the *Goal* condition who do not attain the goal reporting significantly lower *Positive Affect* relative to the *Goal* condition who do attain the goal both under the *Concurrent* temporality (Comparison 2: t = 3.69, p <0.01; two-tailed), and *Sequential* temporality conditions

[93] I do not find a significant difference in *Positive Affect* between participants in the *Goal*/*Sequential* condition who do not attain the goal and the *Goal*/*Concurrent* condition who do not attain the goal (F = -2.12, p-value = 0.28; two-tailed).

(Comparison 5: t = 6.38, p-value < 0.01; one-tailed). Participants in the *Goal* condition who do not attain the goal also report significantly lower *Positive Affect* compared to the *Piece-rate* condition under *Concurrent* temporality (Comparison 3: t = 4.25, p-value < 0.01; two-tailed), and *Sequential* temporality (Comparison 6: t = 6.80, p-value < 0.01; two-tailed). Thus, the marginally significant *Feedback Direction x Task Temporality* interaction is due to significantly lower *Positive Affect* experienced by those who fail to attain the goal relative to both those who attain the goal, and those earning piece-rate incentives.

H2 Supplemental Test 2: The Moderating Effect of Task Temporality on Negative Affect

Table 12 presents the analysis to examine whether *Task Temporality* moderates the effects of *Feedback Direction* on the strength of the *Negative Affect* experienced for participants in the *Goal* condition who do not attain the goal relative to the *Piece-rate* condition. I expect that under *Sequential* temporality, participants working under the *Goal* condition who do not attain the goal experience greater *Negative Affect* relative to those in the *Piece-rate* condition because they receive performance feedback confirming goal failure and will not receive any goal-based incentives. Thus, I also expect that *Negative Affect* should be greater for those in the *Goal* condition who do not attain the goal under *Sequential* temporality versus *Concurrent* temporality. Finally, I expect that *Negative Affect* should be lower for participants in the *Goal* condition who attain the goal under *Sequential* temporality versus *Concurrent* temporality because they receive performance feedback confirming that they have attained the goal and will earn the goal-based incentive.

Panel A of Table 12 presents the descriptives and shows that *Negative Affect* is greater for participants in the *Goal* condition who do not attain the goal under *Sequential* temporality (mean = 30.07) than under *Concurrent* temporality (mean = 25.48). Consistent with my expectation, *Negative Affect* is greater under the *Sequential* temporality for participants in the *Goal* condition who do not attain the goal versus the *Piece-rate* condition (mean = 16.55). Panel B of Table 12 presents the results of the ANOVA and shows that the significant main effect of *Feedback Direction* (F = 40.14, p-value < 0.01; two-tailed) is qualified by a significant *Feedback Direction x Task Temporality* interaction (F = 8.73, p-value < 0.01; two-tailed).

Post-ANOVA tests presented in Panel C of Table 12 reveal that *Negative Affect* is significantly greater for those in the *Goal* condition who do not attain the goal under *Sequential* temporality versus *Concurrent* temporality (Comparison 8: t = 2.69, p-value = 0.04; one-tailed), consistent with my expectations.[94] I also find that *Negative Affect* is significantly greater for those in the *Goal* condition who do not attain the goal under *Sequential* temporality relative to the *Piece-rate* condition under *Sequential* temporality (Comparison 4: t = 7.97, p-value < 0.01; one-tailed). Therefore, I find support that participants in the *Sequential* temporality condition under goal-based incentives who do not attain the goal experience greater *Negative Affect* versus those in the *Concurrent* temporality condition.

I also find evidence that participants in the *Goal* condition who do not attain the goal experience greater *Negative Affect* compared to the *Piece-rate* condition under *Sequential* temporality. Additional pairwise comparisons presented in Panel C of Table 12 reveal that *Negative Affect* is significantly greater for those in the *Goal* condition who do not attain the goal under *Concurrent* temporality versus the *Piece-rate* condition under *Concurrent* temporality (Comparison 1: t = 4.55, p-value < 0.01; two-tailed). Consistent with my expectation under

[94] I also find that participants in the *Goal* condition who attain the goal under *Sequential* temporality experience significantly less *Negative Affect* compared to *Concurrent* temporality (Comparison 9: = 3.17, p-value = 0.01: one-tailed). Therefore, positive performance feedback confirming goal attainment lowers the amount of *Negative Affect* experienced under the *Goal* condition.

Sequential temporality, *Negative Affect* is significantly greater for those in the *Goal* condition who do not attain the goal versus those in the *Goal* condition who attain the goal (Comparison 5: t = 6.86, p-value < 0.01; one-tailed). Overall, the results of the supplemental analyses for H2 confirm that participants experience significantly greater negative affective reactions to performance feedback under sequential multitasking when the performance feedback confirms goal failure relative to concurrent multitasking. I do not find support that participants experience significantly greater positive affective reactions to performance feedback confirming goal attainment under sequential multitasking relative to concurrent multitasking.

6.5.3 H3a Supplemental Analyses

H3a Supplemental Test: The Effect of Goal Commitment on Positive Effort Spillover

H3a predicts that employees working under *Sequential* temporality in the *Goal* conditions who attain the goal on Task 1 will have the greatest *Task 2 Performance* relative to all other conditions. Following the significant support for H3a, I conduct a supplemental analysis in an attempt to add further insights regarding my findings. Specifically, I examine whether differences in *Goal Commitment* impact the effort spillover onto Task 2 (i.e., *Task 2 Performance*) and are driving the results found for H3a. Because H3a examines positive spillover effects onto Task 2 following goal attainment on Task 1, I conduct my supplementary analysis for H3a using only participants in the *Goal* condition who attain the goal. Consistent with theory, I expect that greater commitment to the Task 1 goal will result in greater positive affective reactions to the positive performance feedback on Task 1, leading to greater effort spillover onto Task 2.

Table 14 presents the analysis to examine if *Goal Commitment* leads to differences in *Task 2 Performance* for participants who attain the goal on Task 1. Specifically, I conduct supplemental analyses to determine if the positive spillover effects found for H3a are driven by *High Goal Commitment* to Task 1. Based on H3a, I expect that participants who attain the Task 1 goal and have *High Goal Commitment* to Task 1, will have higher *Task 2 Performance* relative to participants with *Low Goal Commitment* who achieve the Task 1 goal. According to goal setting theory, higher goal commitment leads to greater performance on the task that the goal is associated with (Latham and Locke 2007).[95] Thus, building on goal setting theory, I expect that participants who are highly committed to goal achievement and attain the goal on Task 1 are also more likely to exert greater effort on Task 2, compared to those who are not highly committed to goal achievement on Task 1 (Locke and Latham 2002).

<< *Insert Table 14 About Here* >>

To determine the effects of *Goal Commitment* on *Task 2 Performance* for participants who attain the goal, I use a 2 x 2 ANCOVA, with *Goal Commitment* (*High Goal Commitment* versus *Low Goal Commitment*) and *Task Temporality (Concurrent* versus *Sequential)* as the independent variables, and *Task 2 Performance* as the dependent variable. I include *Task 2 Ability* as a covariate. Panel A of Table 14 presents the descriptives for *Task 2 Performance* for participants with *Low Goal Commitment* who attain the goal and those with *High Goal Commitment* who attain the goal. The descriptive results indicate that *Task 2 Performance* is greater for *High Goal Commitment* (adjusted mean = 48.06) relative to *Low Goal Commitment* (adjusted mean = 45.79). Panel B of Table 14 presents the results of the ANCOVA. Inconsistent with my expectation, I find an insignificant effect of *Goal Commitment* on *Task 2 Performance*

[95] Interestingly, untabulated results of an ANCOVA, including *Task 1 Ability* as a covariate, reveal an insignificant difference in *Task 1 Performance* between *High Goal Commitment* and *Low Goal Commitment* participants for all participants in the Goal condition (i.e., those who did and did not attain the goal) ($F = 0.11$, $p = 0.74$; two-tailed), which is inconsistent with goal-setting theory.

(F = 1.48, p-value = 0.22; two-tailed), controlling for *Task 2 Ability*. The results of the supplemental analysis suggest that the support found for H3a is not driven by participants with *High Goal Commitment*. Results from the ANCOVA reveal a marginally significant main effect of *Task Temporality* on *Task 2 Performance* (F = 2.20, p-value = 0.07; one-tailed), with *Task 2 Performance* greater under *Sequential* versus *Concurrent* temporality.[96] No significant *Goal Commitment* x *Task Temporality* interaction is found (F = 0.02, p-value = 0.88; two-tailed). Thus, the positive effort spillover effects following positive performance feedback confirming goal attainment occur for participants with *High Goal Commitment* and *Low Goal Commitment*.

6.5.4 Supplemental Analysis Examining the Theoretical Model

For the final supplemental analysis, I test my theoretical model presented in Figure 1. Following the results from my analyses above, particularly given the support for H3a, I use a path analysis to understand the relationship between affect and *Task 2 Performance* and to explain the positive effort spillover effects found for those in the *Goal* condition who attain the goal under *Sequential* task temporality.

Based on my theoretical model and hypotheses, I expect that participants in the *Goal* condition who attain the goal under *Sequential* task temporality experience significantly greater *Positive Affect* relative to all other conditions. Second, I expect that *Positive Affect* will lead to significant, positive effort spillover onto the second, unincentivized task under *Sequential* temporality (i.e., *Task 2 Performance*) (H3a). To test the predicted relationships between the *Feedback Direction*, *Task Temporality*, *Affect Type,* and *Task 2 Performance,* I conduct the path

[96] The F-test is reported as one-tailed because the result is directionally consistent with the prediction and is consistent with the t-test result.

analysis presented in Figure 12.[97] A path analytic technique allows me to investigate the direct and indirect effects of the antecedents and consequences of affect on effort spillover (Alwin and Hauser 1975; Duncan 1966; Perrow 1967). Following Kerlinger and Pedhazur (1973), a path analytic technique is appropriate to determine whether "the pattern of correlations for a set of observations is consistent with a specific theoretical formulation" (Chong and Monroe 2015: 123).

Following Hayes (2013), I bootstrap the standard errors using 10,000 bootstrap repetitions. The model fit statistics suggest a good overall fit with the data: CFI > 0.99, TLI > 0.99; RMSEA < 0.01, SRMR = 0.03 (Browne and Cudeck 1993; Hu and Bentler 1998; West et al. 2012). Table 15 and Figure 12 presents the statistical results of the path model for participants in the *Goal*/*Sequential* condition who attain the goal (coded as 1) relative to those in the *Goal*/*Concurrent* condition who attain the goal, the *Piece-rate/Concurrent* condition, and the *Piece-rate/Sequential* condition (all coded as 0). Results from the path analysis presented in Figure 12 and Table 15 provide some support for my theoretical model.[98]

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[97] I include years of work experience (*Work Experience*) as a control variable in the model because I determine that work experience is significant positively correlated with *Positive Affect* ($r = 0.31$, p-value < 0.01; two-tailed), significantly negatively correlated with *Negative Affect* ($r = -0.25$, p-value < 0.01; two-tailed) and is significantly negatively correlated with *Task 2 Ability* ($r = -0.20$, p-value = 0.01; two-tailed) for participants in the *Goal* condition who attain the goal. *Work Experience* is not significantly correlated with *Task 2 Performance* ($r = -0.01$, p-value = 0.87; two-tailed). I also determine that *Age* (in years) is significantly positively correlated with *Positive Affect* ($r = 0.28$, p-value < 0.01; two-tailed) and *Work Experience* ($r = 0.89$, p-value < 0.01; two-tailed), and significantly negatively correlated with *Negative Affect* ($r = -0.26$, p-value < 0.01; two-tailed) with *Task 2 Ability* ($r = -0.23$, p-value < 0.01; two-tailed). *Age* is not significantly correlated with *Task 2 Performance* ($r = -0.02$, p-value = 0.82; two-tailed). However, when *Age* is included in the path analysis as a control variable in the model, it is not significantly associated with *Positive Affect* or *Negative Affect* (both p-values > 0.83; two-tailed). Therefore, I only include *Age* as a control variable for *Work Experience* and *Task 2 Ability* for simplicity, which are both significant paths (both p-values ≤ 0.05; two-tailed). The results for the path analysis do not change substantively by removing *Age* as a control variable for *Positive Affect* and *Negative Affect*. I include *Work Experience* as control variable for *Positive Affect* and *Negative Affect* in the path analysis model. I do not include *Work Experience* as a control variable for *Task 2 Ability* in the final path model because the path is not significant when controlling for *Age* (untabulated p-value = 0.21; two-tailed).

[98] I allow *Positive Affect* and *Negative Affect* to covary and confirm a statistically significant, negative covariance between *Positive Affect* and *Negative Affect* (standardized path coefficient = -0.29, p-value < 0.01; two-tailed).

<< Insert Table 15 About Here >>

<< Insert Figure 12 About Here >>

I find a statistically significant, positive path coefficient from *Positive Affect* to *Task 2 Performance* (standardized path coefficient = 0.10, p-value = 0.05; one-tailed), consistent with my theoretical model. This result confirms that participants who experience greater *Positive Affect* following performance feedback on the incentivized task exhibit positive effort spillover onto the subsequent unincentivized task (i.e., *Task 2 Performance*). However, inconsistent with my predictions, I do not find that participants in the *Goal/Sequential* condition who attain the goal experience greater *Positive Affect* relative to the other conditions (standardized path coefficient = 0.02, p-value = 0.38; one-tailed). I also do not find a significant association between *Condition* and *Negative Affect* (standardized path coefficient = -0.05, p-value = 0.12; one-tailed) indicating that participants in the *Goal/Sequential* condition who attain the goal do not experience lower *Negative Affect* relative to the other conditions (i.e., *Goal/Concurrent* condition for those who attain the goal, *Piece-rate/Sequential*, and *Piece-rate/Concurrent*). I also do not find a significant negative association between *Negative Affect* and *Task 2 Performance* (standardized path coefficient = -0.02, p-value = 0.37; one-tailed), indicating that negative effort spillover effects do not occur through *Negative Affect*.[99] This finding is surprising given that theories on affect suggest that negative affect has a more significant and enduring impact on subsequent behaviours relative to positive affect (Baumeister et al. 2001). Finally, the path analysis reveals a significant direct association between the *Goal*/*Sequential* condition for those

[99] I find insignificant combined indirect effects of *Condition* on *Task 2 Performance* through *Positive Affect* and *Negative Affect* (untabulated: unstandardized path coefficient = 0.08, p-value = 0.67; two-tailed). Both the indirect effect of *Condition* on *Task 2 Performance* through *Positive Affect* (untabulated: unstandardized path coefficient = 0.05, p-value = 0.75; two-tailed), and the indirect effect of *Condition* on *Task 2 Performance* through *Negative Affect* are insignificant (untabulated: unstandardized path coefficient = 0.03, p-value = 0.76; two-tailed).

who attain the goal and *Task 2 Performance* (standardized path coefficient = 0.09, p-value = 0.04; two-tailed), suggesting that another factor associated with the *Goal/Sequential* condition for participants who attain the goal is contributing to greater effort spillover effects relative to the other conditions. However, based on the data collected I am unable to determine what the other factor contributing to the positive effort spillover effect is.[100]

Overall, the findings from the path analysis suggest that under goal-based incentives and sequential multitasking, positive feedback confirming goal attainment is not associated with greater positive affect or lower negative affect relative to the *Goal/Concurrent* condition for participants who attain the goal, the *Piece-rate/Sequential* condition, and the *Piece-rate/Concurrent* condition. While the path analysis results indicate that the negative affect experienced in my setting does not impact (negatively or positively) effort on a subsequent task, I confirm that positive affect does have a positive effort spillover effect onto a subsequent task. Importantly, the results of the path analysis show that positive affect can have important implications for effort on other tasks.

[100] Within goal theory, self-efficacy is an important potential mediator impacting the subsequent effort following task performance (Locke and Latham 2002). I conduct an alternative version of the path analysis, reported in Figure 12 and Table 15, with *Self-Efficacy* as a mediator between *Condition* and *Task 2 Performance* and I allow *Self-Efficacy* to co-vary with *Positive Affect* and *Negative Affect.* In untabulated results, I find a marginally significant negative association between goal attainment in the *Goal*/*Sequential* condition and *Self-Efficacy* (standardized path coefficient = -0.09, p-value = 0.08; two-tailed) relative to the other conditions. However, I find an insignificant effect of *Self-Efficacy* on *Task 2 Performance* (standardized path coefficient = -0.01, p-value = 0.91; two-tailed). I also run a 2x2 ANOVA with *Feedback Direction* (*Piece-rate* and *Goal* for those who attain the goal) and *Task Temporality* as the independent variables and *Self-Efficacy* as the dependent variable. Based on an untabulated ANOVA, I do not find that *Self-Efficacy* is significantly greater for participants in the *Goal* condition who attain the goal versus those in the *Piece-rate* condition (untabulated: F = 2.42, p-value = 0.12; two-tailed), nor do I find a significant main effect of *Task Temporality* (untabulated: F = 1.10, p-value: 0.30; two-tailed), or a significant *Feedback Direction x Task Temporality* interaction (untabulated: F = 0.13, p-value: 0.72; two-tailed) on *Self-Efficacy*. Thus, differences in *Self-Efficacy* do not explain the results found for H3a. Overall, self-efficacy does not explain the difference in effort spillover effects between participants in the *Goal*/*Sequential* condition who attain the goal relative to other conditions.

6.6 Summary of Findings

Table 16 provides a summary of the results from my main and supplemental analyses. The results from my main study provide evidence that the type of incentive used in an incomplete contract setting has important implications on the affective state of employees, which can lead to effort spillover effects onto other tasks.

<< *Insert Table 16 About Here* >>

I determine that goal-based incentives lead to greater overall affective reactions to performance feedback compared to piece-rate conditions (H1). From my supplemental analyses, I confirm that this effect is largely driven by participants working under goal-based incentives experiencing greater negative affect relative to those working under piece-rate incentives. I determine that goal-based incentives do not lead to greater positive affect compared to piece-rate incentives, even when the goal is attained. I also confirm that goal commitment does not impact the strength of the positive or negative affective response to performance feedback under goal-based incentives.

I do not find support that task temporality moderates the overall affective response to feedback between the incentive contract types (H2). However, I do find evidence that sequential multitasking leads to a lower (higher) negative affective response to performance feedback for individuals who attain (fail to attain) the goal relative to concurrent multitasking. I do not find that task temporality impacts the strength of the positive affective response to performance feedback for either goal-based or piece-rate incentives. Therefore, task temporality only appears to moderate the negative affective response to feedback for participants working under goal-based incentives. Consistent with my expectations, I confirm that task temporality does not moderate the strength of the positive and negative affective responses to feedback under piece-rate incentives. Thus, task temporality does appear to have some moderating effects on affective response to performance feedback for goal-based incentives, but not for piece-rate incentives.

Despite the insignificant difference in positive affect between participants working under the piece-rate and goal-based incentives who attain the goal, I find that the greatest effort spillover effects onto the unincentivized task occur under goal-based incentives following positive performance feedback that confirms goal attainment on the incentivized task (i.e., under sequential temporality) (H3a). Combined with the affective consequences of performance feedback above, this finding suggests that the way in which the tasks are performed under multitask settings appears to matter more for goal-based incentives than piece-rate incentives. Inconsistent with my prediction, I do not find evidence that the lowest effort spillover effects onto the unincentivized task occur under goal-based incentives following goal failure and completion of the incentivized task (i.e., under sequential temporality) (H3b).

From the path analysis, I confirm that positive affect from performance feedback on one task is positively associated with effort spillover onto another task. However, inconsistent with theory I do not find evidence that negative affect is negatively associated with effort spillover onto another task. Consistent with my hypothesis testing, I do not find evidence that goal attainment under sequential multitasking is associated with greater positive affect relative to the piece-rate conditions, or goal attainment under concurrent multitasking.[101] Consistent with H3a, I find a direct, positive association between the *Goal/Sequential* condition for those who attain the goal and effort spillover effects onto the second task. Because I do not find significant differences in the level of positive affect experienced between participants who attain the goal,

[101] This finding may also be because the path analysis includes only those in the *Goal* condition who do attain the goal. Consequently, *Negative Affect* may be too weak to override the positive effort spillover effects induced from *Positive Affect*.

and those earning piece-rate incentives, under sequential multitasking, I am unable to conclude on the exact mechanism leading to greater performance on the second task for participants who attain the goal. Inconsistent with theory, I do not find evidence that the negative affect experienced by participants working under goal-based incentives has any negative effort spillover effects. Therefore, when tasks are performed sequentially, the benefits from employing goal-based incentives under sequential multitasking, which include greater performance on both the incentivized and unincentivized tasks, appear to outweigh any potential downsides from goal failure. When tasks are performed concurrently, the findings from the supplemental analysis for H2 and the path analysis suggest that it is more beneficial to employ piece-rate incentives to maximize the positive effort spillover effect from positive affect.

Taken together, my results show that positive affect derived from performance feedback on an incentivized task can have important performance implications for unincentivized tasks. Therefore, it is important for organizations that choose to employ incentives to consider the affective consequences and performance spillover effects of the incentives. While I do not find support that negative affect leads to negative effort spillover implications for other tasks, I do find evidence that positive affect has significant positive effort spillover effects on other tasks.

CHAPTER 7: CONCLUSION

7.1 Introduction

In this chapter, I provide an overview of my study in section 7.2, and I discuss the results of my hypotheses in section 7.3. I identify some of the limitations of this study as well as areas for future research in section 7.4, and provide concluding remarks in section 7.5.

7.2 Study Overview

Incomplete incentive contracts in multitask environments present a significant control challenge of ensuring that employees expend sufficient effort towards all assigned tasks and responsibilities, particularly those that are not directly incentivized (Holmstrom and Milgrom 1991). In a multitask setting, organizations must decide which tasks to incentivize, as well as what type(s) of incentive contract to employ for those tasks. It is not clear ex ante if incentive contract type combined with the performance feedback message provided on an incentivized task will spillover to affect the amount of effort exerted on the unincentivized task, and if these effects will be moderated by task temporality. I use an experiment to examine the affective consequences and effort spillover effects from employing either goal-based or piece-rate incentives in an incomplete contract setting, under either concurrent or sequential multitasking.

7.3 Results Discussion

First, as predicted in H1, I find evidence that goal-based incentives employed for incentivized tasks lead to greater overall affective reactions to performance feedback relative to piece-rate incentives. Theory suggests that performance feedback under goal-based incentives should lead to a stronger positive affective response following goal attainment, and a stronger negative affective response following goal failure, when the goal-based incentives are tied to a moderately challenging goal (Locke 2004; Locke and Latham 1990a, 1990b). My study provides unique empirical evidence that different incentive contracts lead to differences in affective responses. Specifically, I find that the difference in affect between the goal-based and piece-rate incentives is primarily due to a stronger negative affective response to performance feedback under goal-based versus piece-rate incentives. The theory underlying H1 posits that performance feedback indicating goal attainment or expected goal attainment under goal-based incentives will induce greater positive affect relative to performance feedback under piece-rate incentives (Locke and Latham 1990a, 1990b). However, I do not find significant differences in positive affect to performance feedback between the goal-based incentives for participants who either attain or expect to attain the goal, and participants working for the piece-rate incentives. Goal theorists posit that goals induce effort by prompting individuals to work hard to avoid failing to attain the goal (Darnon et al. 2007). According to Elliot (1997, 1999), goal settings that emphasize the possibility and consequences of failure can prompt negative emotions. In my setting, the goal-based incentives may have prompted more negative affect in participants, such as anxiety and helplessness, relative to the piece-rate incentives due to the substantial risk of not receiving any incentive compensation if the goal was not attained (Locke 2004; Presslee et al. 2013).

Second, inconsistent with H2, I do not find evidence that task temporality moderates the overall affective response to performance feedback under goal-based incentives versus piece-rate incentives. Supplemental analyses reveal that task temporality influences the strength of the negative affect experienced following performance feedback under goal-based incentives but does not impact the positive affect experienced following performance feedback under goal-based incentives. Following Darnon et al. (2007), these findings suggest that the goal-based incentives led to a focus on negative emotions causing only negative affect to be moderated by task temporality. Consistent with theory underlying H2, I find that task temporality does not influence either negative affect or positive affect to performance feedback under piece-rate incentives.

Third, as predicted in H3a, I find that participants who attain the goal on the incentivized task under sequential multitasking have significantly greater effort spillover onto the unincentivized task relative to all other conditions. Results from my path analysis confirm that positive affect is associated with positive effort spillover effects. However, contrary to the theory underlying H3a, I do not find evidence that the positive effort spillover effect is due to greater positive affect experienced by those who attain the goal relative to the other conditions. A path analysis confirms a significant, direct association between the goal-based incentives following goal attainment under sequential multitasking and performance on the unincentivized task. Extant research on goals and feedback suggests that goal attainment is associated with increased self-efficacy, which is positively associated with subsequent task effort and performance (Latham and Locke 2007). However, I do not find evidence that the effort spillover effects are due to increased self-efficacy from goal attainment. The lack of support for self-efficacy's association with effort spillover effects may be due to the fact that I measure self-efficacy in the post-experimental questionnaire, and therefore I may not have captured the relationship between performance feedback, affect, and self-efficacy. Prior studies that examine the link between goal attainment/failure, self-efficacy, and subsequent effort measure it immediately following the performance feedback (e.g., Quintela 2005; Quintela and Donovan 2008). By measuring self-efficacy in the post-experimental questionnaire, my self-efficacy measure may have captured other experiences during the experiment that proceeded the performance feedback message, thus preventing me from finding a significant association between participants who attain the goal under sequential multitasking and effort spillover effects mediated by self-efficacy.

Lastly, inconsistent with H3b, I do not find evidence that participants who do not attain the goal on the incentive task under sequential multitasking have significantly lower effort spillover onto the unincentivized task relative to all other conditions. Based on my theoretical model, I do not find that negative affect is associated with negative spillover effects. Based on the left skewed distribution of *Negative Affect* (untabulated skewness = -1.04), this finding may be due to the challenge that I experience inducing high negative affect in participants. Prior studies examining the effort spillover effects from affect have also encountered difficulties finding a significant association between negative affect and negative effort spillover effects onto subsequent tasks. For example, Quintela (2005) does not find evidence of negative effort spillover effects from negative affect following negative feedback. Based on her findings, Quintela (2005) notes that the floor effect for negative affect she finds among her participants may have undermined her ability to find the predicted relationships involving negative affect. Additionally, research studies confirm that negative affect has less predictable and inconsistent effects on behaviour relative to positive affect (Isen 1999, 2003, 2008). Thus, the null result may suggest that theory for the relationship between negative affect and effort needs to be revised.

7.4 Limitations and Opportunities for Future Research

Like all studies, my study is subject to limitations that provide opportunities for future research. My application of psychology theory generalizes only to the extent that my experimental setting captures important elements of incentive systems, performance feedback, and multitask settings observed in practice. By necessity, some of my design choices abstracted from practice. One limitation of my study is that, because I operationalized a simple task environment using two effort-sensitive tasks to allow for a clear test of theory, I cannot speak to the effort spillover effects in a high complexity task environment. For example, both Webb et al. (2013) and Brüggen et al. (2018) demonstrate that task complexity can complicate the seemingly straightforward association between goals and effort. Future research could investigate how different task attributes, such as task complexity or task complementarity, interact with incentive schemes and task temporality to influence effort spillover effects.

Second, I assigned the same goal to all participants working under goal-based incentives, rather than assigning individualized goals to participants based on their practice performance (Anand 2017). Using a goal that is not tailored to each individual participant may have limited their goal commitment if they perceived the assigned goal as too easy or too difficult relative to their practice performance (Latham and Locke 1991; Locke and Latham 2002). If the assigned goal was perceived as too easy for participants working under goal-based incentives this may have limited my ability to find differences in positive affect between participants who attained the goal and those working under piece-rate incentives. If the assigned goal was perceived as too difficult, this could have increased negative affect associated with unfairness, which could explain the findings associated with significant negative affective responses to performance feedback for the goal-based incentive conditions (Libby 2001). Future research could examine if individualized assigned goals impact the affective responses to performance feedback under goal-based incentives.

Third, goal theory posits that goal commitment is an important moderator of the link between goal difficulty and effort, and research has shown that goal participation can increase commitment to the goal, thereby increasing the chance to find results consistent with my predictions, should they exist (Latham et al. 1978; Latham et al. 1988; Sue-Chan and Ong 2002).

For example, future research could examine if participation in goal setting increases goal commitment, thereby increasing the affective responses to performance feedback, and subsequent effort spillover effects.

Fourth, to ensure that the performance feedback message for the incentivized task was consistent between the goal-based and piece-rate incentive conditions, I limited the positive or negative valence of the message for those in the goal-based incentive conditions, by avoiding explicitly telling participants whether their performance was good or bad on the incentivized task. Prior studies find that the language used to convey feedback information impacts the affective reaction to the message even when the information conveyed in the feedback is held constant (Ilgen et al. 1979; Loftus and Tanlu 2018). Thus, by trying to maintain comparability in the feedback message between the goal-based incentive and piece-rate incentive conditions, I may have weakened my ability to find significant associations between the manipulated variables, affect, and effort spillover effects, should they exist. For example, Quintela (2005) does not find that performance feedback indicating failure relative to a goal leads to a negative affective response in her study, however, Quintela and Donovan (2008) find a significant association between negative performance feedback and negative affect. Quintela (2005) posits that this is because Quintela and Donovan (2008) provide participants with strongly valanced feedback messages, which likely led to increased negative affect. Future research could examine how the language used in the feedback message to indicate goal success or failure impacts the strength of the affective response to the feedback, and the subsequent impact on effort. For example, prior studies manipulate negative performance feedback by using strongly valanced wording from an external feedback source (e.g., “That’s not very good at all!”) to evoke negative affect (Carver et al. 1979: 1861). Future research could examine how to increase positive affect based on the wording used in performance feedback messages to increase positive effort spillover effects.

Lastly, because of the complexity of the theoretical model that I tested in my study, multiple experiments may have helped to test each of the links in my model separately. For example, Asay et al. (2021) argue that multiple experimental studies can be employed to provide convergent evidence of a predicted theoretical process by separately testing each part of the causal chain. Future research could test the predicted associations between incentive type, affect, and effort by testing each of the predicted links in the model using a multiple experimental study design. For example, one experiment could test the link between incentive type and affect, while a second experiment could test the link between affect and effort.

7.5 Conclusions

I believe my study makes a valuable contribution to the goal setting and management accounting literatures. My study extends the existing research that examines the relationship between goals, incentives, and affect (Latham and Locke 2007) by providing evidence that a consequence of using goal-based incentives is the increase in negative affect experienced relative to piece-rate incentives. My study also contributes to the limited extant research on multitask setting by examining how management controls interact with task settings to impact motivational outcomes. While HTT find that incomplete piece-rate incentive contracts lead to greater effort disparity and less effort spillover between the incentivized and unincentivized task under sequential multitasking relative to concurrent multitasking, my study demonstrates that other incentive contracts (i.e., goal-based incentives) increase effort spillover effects under sequential multitasking compared to concurrent multitasking. The results from my study highlight the importance of selecting appropriate management controls for a specific setting in practice.

Finally, my study contributes to the existing accounting literature that seeks to understand the relationship between management controls and effort, by demonstrating that affect that should be considered in these research studies.

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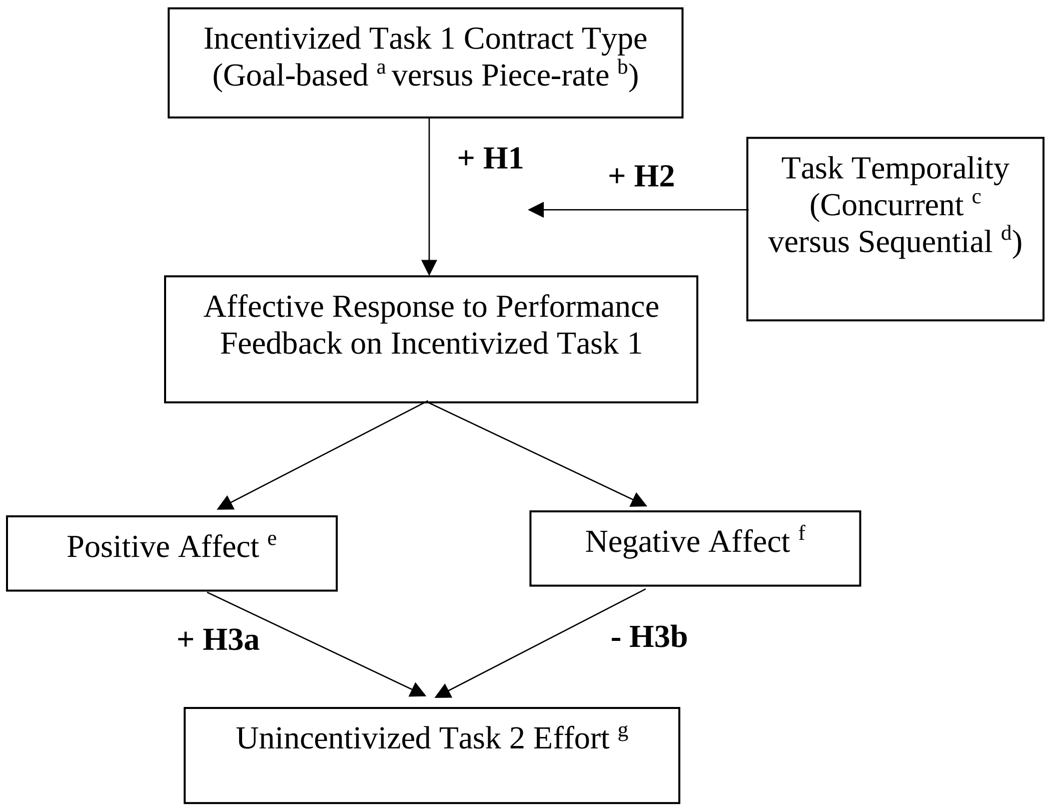
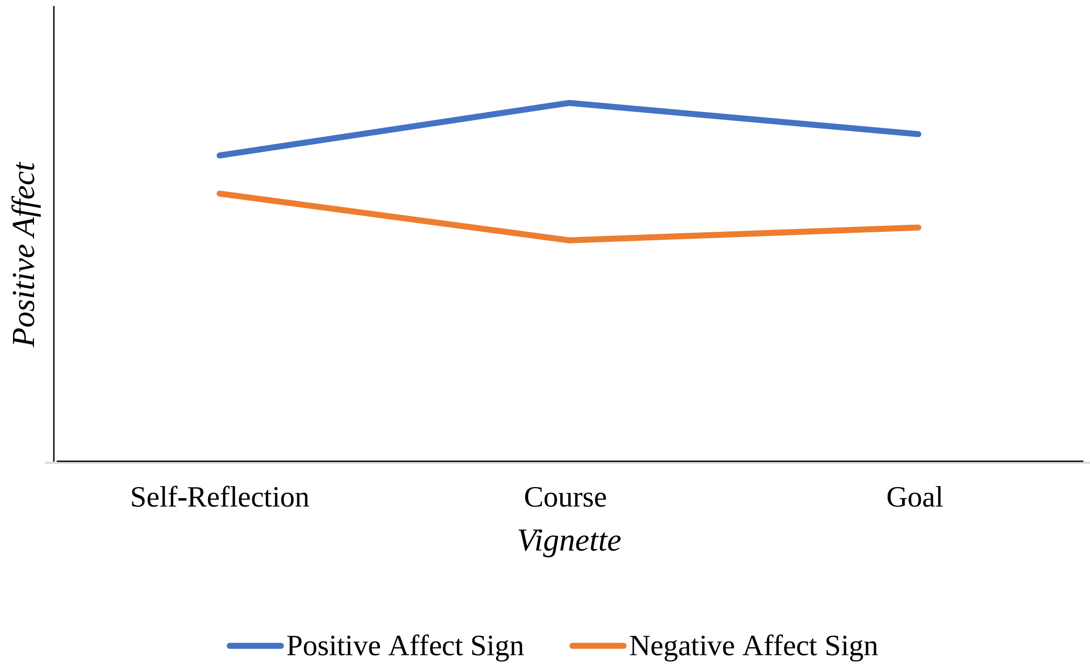
FIGURES

Figure 1
Theoretical Model



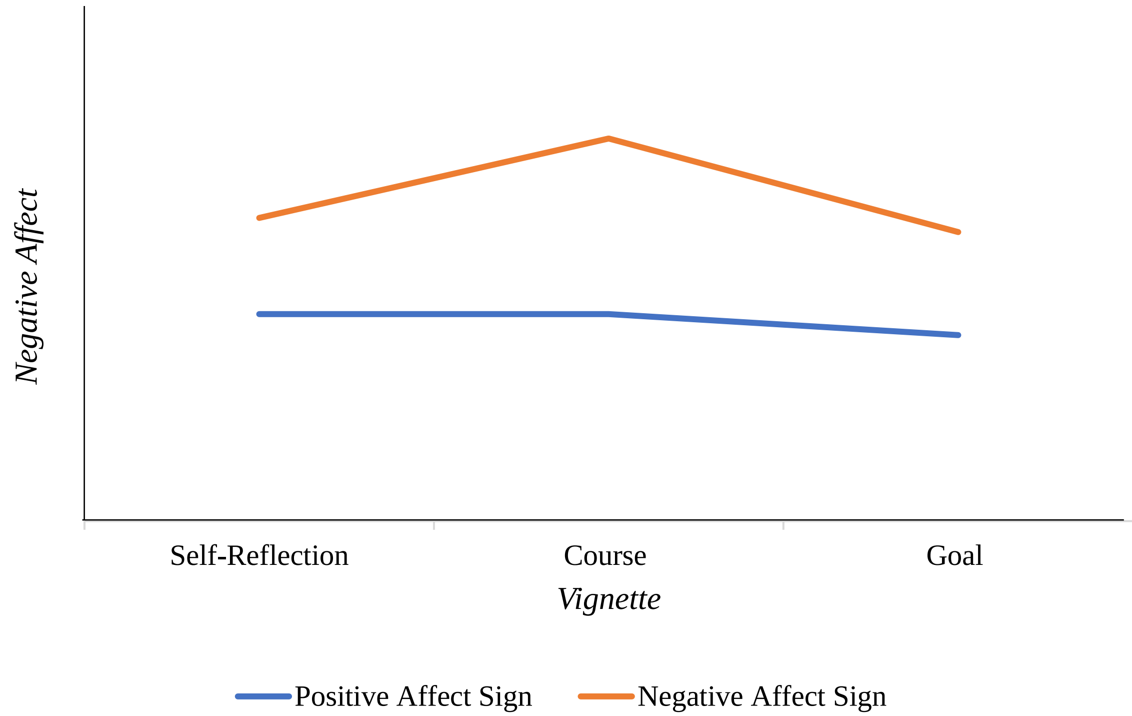
[a] Under goal-based incentives, employees only receive the incentive when they have attained a "certain targeted level of performance" (Bonner et al. 2000: 26).
[b] Under piece-rate incentives, employees receive a "pre-defined amount of money for each unit of output" (Bonner et al. 2000: 26).
[c] Concurrent multitasking involves a high degree of temporal overlap between two or more tasks, where "the tasks are, in essence, performed at the same time" (Salvucci et al. 2009: 1819).
[d] Sequential multitasking occurs when one task is started and completed before another begins and involves a longer amount of time "spent on one task before switching to another" (i.e., a low degree of temporal overlap) (Salvucci et al. 2009: 1820).
[e] Positive affect is defined as "a pleasant state feeling or good mood" (Estrada, Isen, and Young 1994: 286).
[f] Negative affect is defined as a feeling of emotional distress or bad mood (Watson et al. 1988).
[g] Task 2 Performance refers to performance on the unincentivized decode task.

Figure 2
Pilot Study - *Positive Affect* [a] by *Vignette* [b] and *Affect Sign* [c]



[a] *Positive Affect* refers to the combined score that participants assign to the 10 positive affective measures from the PANAS (Attentive + Interested + Alert + Excited + Enthusiastic + Inspired + Proud + Determined + Strong + Active) using the 5-point Likert scales. Refer to Appendix D for a full description of the PANAS affect measures.
[b] *Affect Sign* refers to whether the condition was meant to elicit either *Positive Affect* or *Negative Affect*.
[c] The three positive *Vignette* conditions are: *Positive Self-Reflection*, *Course Success*, and *Goal Attainment*. The three negative *Vignette* conditions are: *Negative Self-Reflection*, *Course Failure*, and *Goal Failure*.

Figure 3
Pilot Study - *Negative Affect* [a] by *Vignette* [b] and *Affect Sign* [c]



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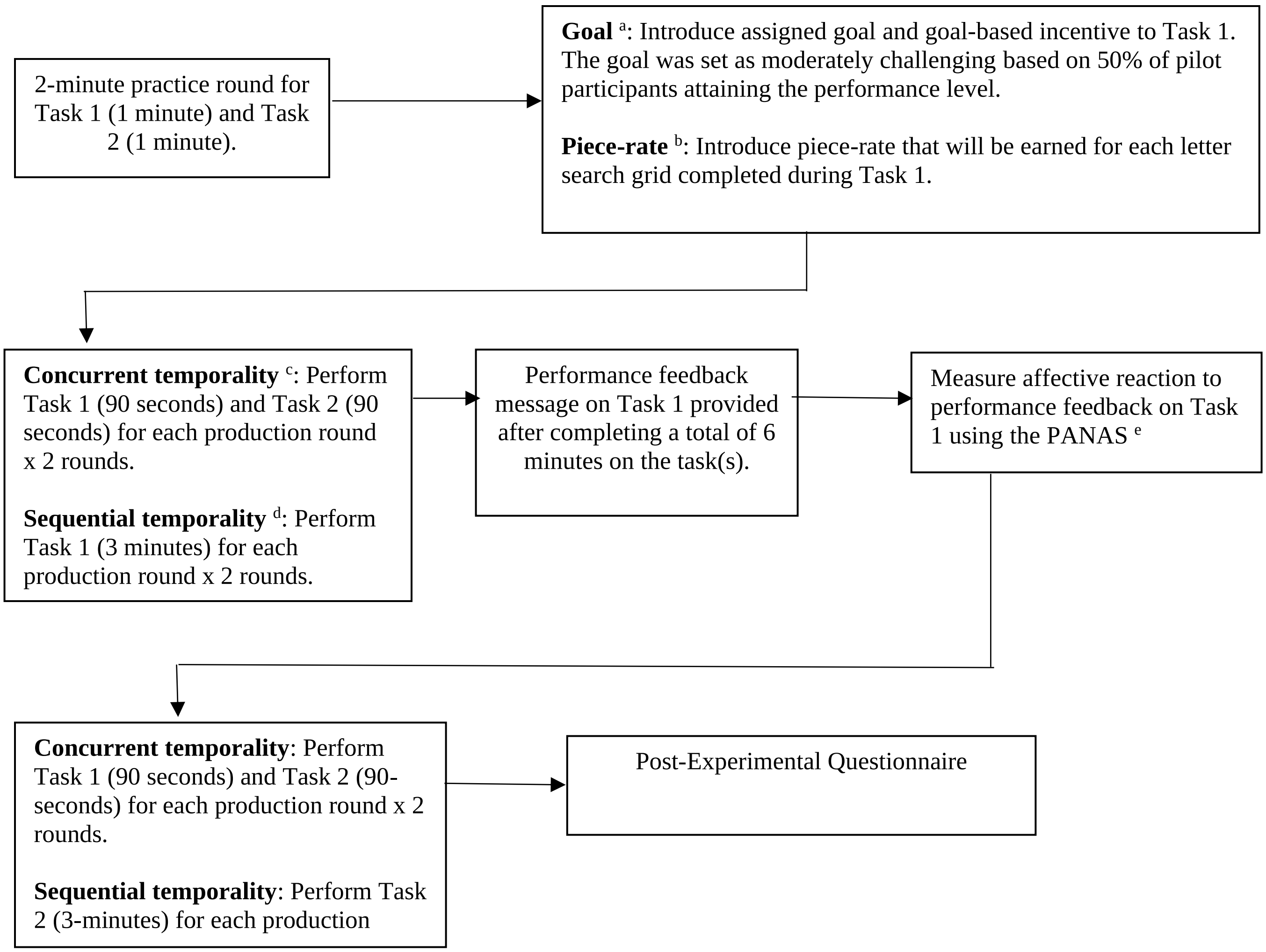
[a] *Negative Affect* refers to the combined score that participants assign to the 10 negative affective measures from the PANAS (Distressed + Upset + Hostile + Irritable + Scared + Afraid + Ashamed + Guilty + Nervous + Jittery) using the 5-point Likert scales. Refer to Appendix D for a full description of the PANAS affect measures.
[b] *Affect Sign* refers to whether the condition was meant to elicit either *Positive Affect* or *Negative Affect*.
The three positive *Vignette* conditions include: *Positive Self-Reflection*, *Course Success*, and *Goal Attainment*. The three negative *Vignette* conditions include: *Negative Self-Reflection*, *Course Failure*, and *Goal Failure*.
[c] The *Self-Reflection* vignette is adapted from (Gasper 2004) (see Appendix A), the *Course* vignette is adapted from (Smith and Lazarus 1993) (see Appendix B). The *Goal* vignette is created by the author (See Appendix C).

Figure 4
Experimental Design [a]

Task 1 Contract Type / Task Temporality	Piece-rate	Goal
Concurrent	1	3
Sequential	2	4

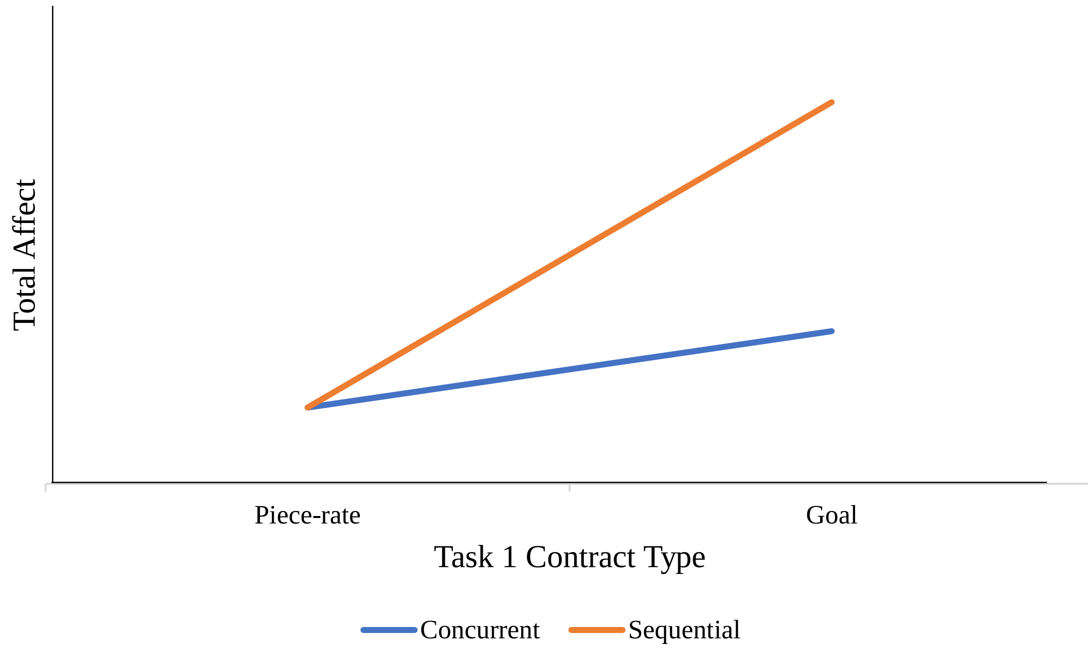
[a] See Appendix L for variable definitions.

Figure 5
Main Study Experimental Research Instrument



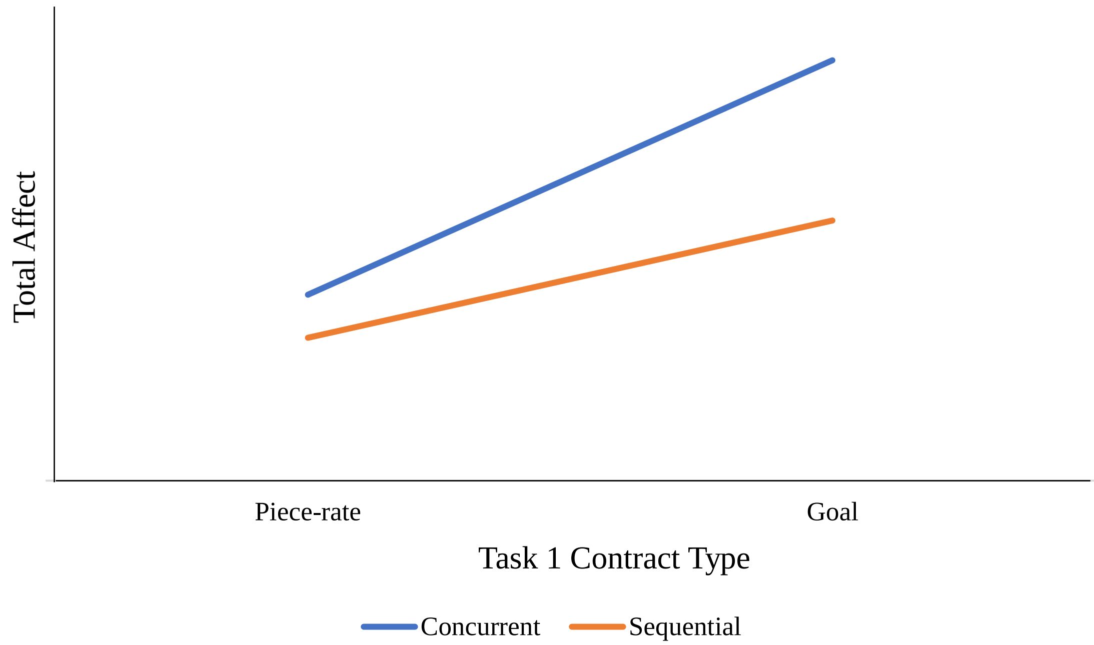
[a] Participants working under the *Goal* condition are assigned a performance goal to complete 11 letter search grids (Goal) for the incentivized letter search task and receive an incentive of $2.75 USD, respectively, if they attain the assigned goal plus $0.25 USD for every letter search grid completed above the assigned goal.
[b] Participants working under the *Piece-rate* condition earn a piece-rate of $0.25 USD for each letter search grid they complete.
[c] In *Concurrent* temporality, participants spend 90 seconds on the letter search task (Task 1) before immediately switching to work on the decode task (Task 2) for 90 seconds. Following completion of both tasks, a new three-minute production round is started, and this process is repeated until participants have worked for a total of six minutes on each task, completing the 12-minute production period.
[d] In *Sequential* temporality, participants complete two, three-minute production rounds on Task 1 before beginning two, three-minute production rounds on Task 2.
[e] The PANAS refers to the Positive and Negative Affect Schedule (Watson et al. 1988). See Appendix D for a full description of the PANAS affect measures.

Figure 6
Main Study - Predicted Results for H1 and H2 [a]



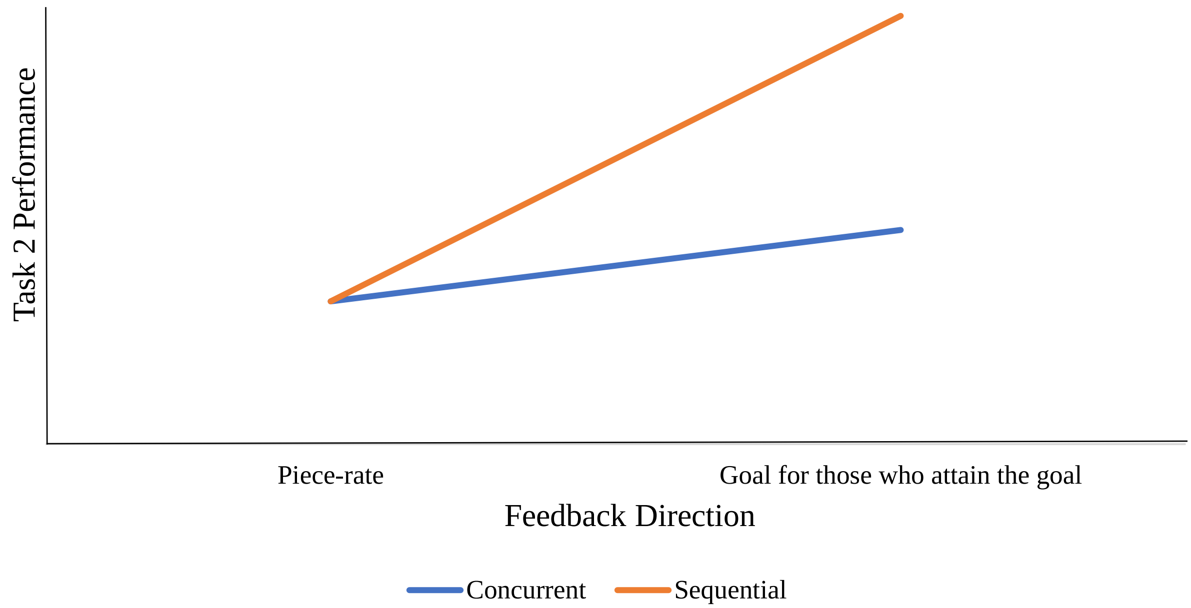
[a] See Appendix L for variable definitions

Figure 7
Main Study - Actual Results for H1 and H2 [a]



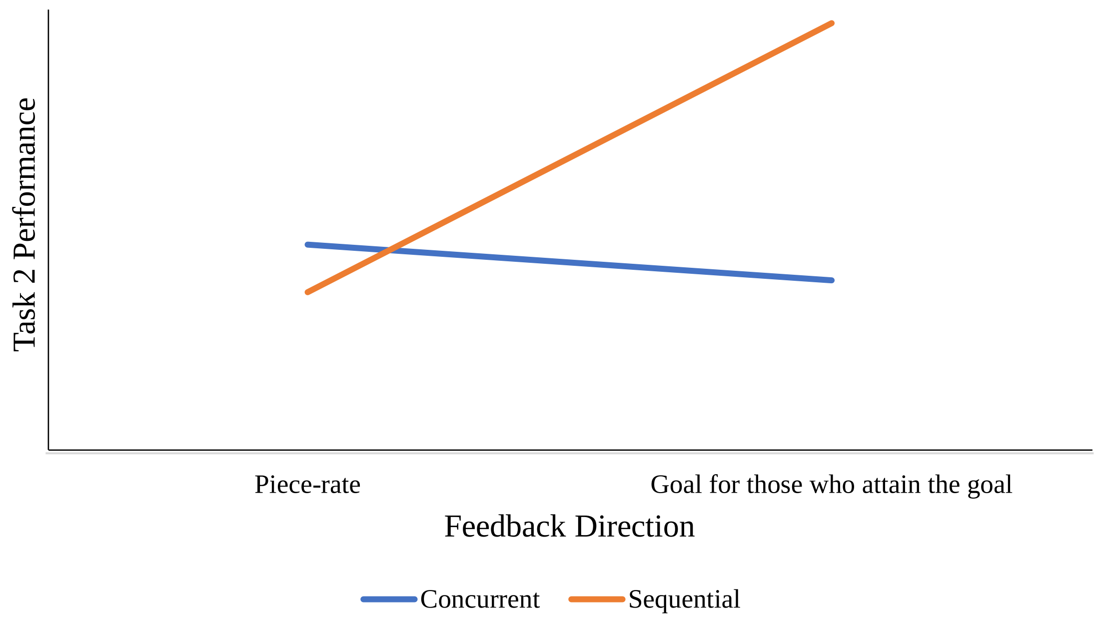
[a] See Appendix L for variable definitions.

Figure 8
Main Study - Predicted Results for H3a [a]



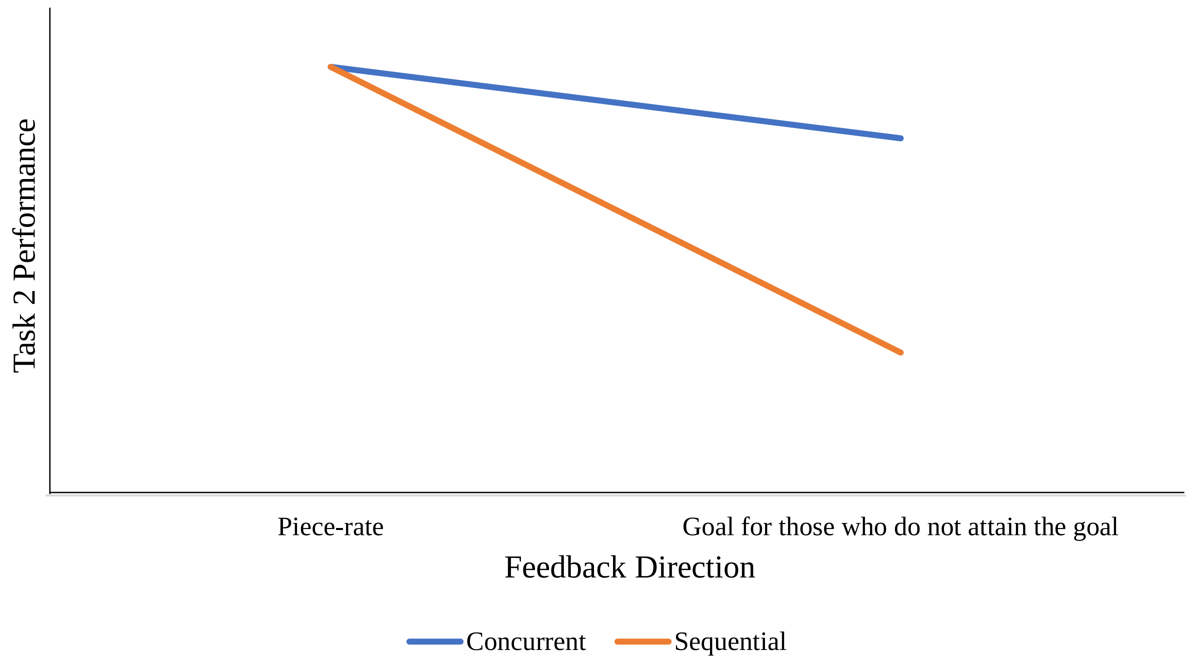
[a] See Appendix L for variable definitions.

Figure 9
Main Study - Actual Results for H3a [a]



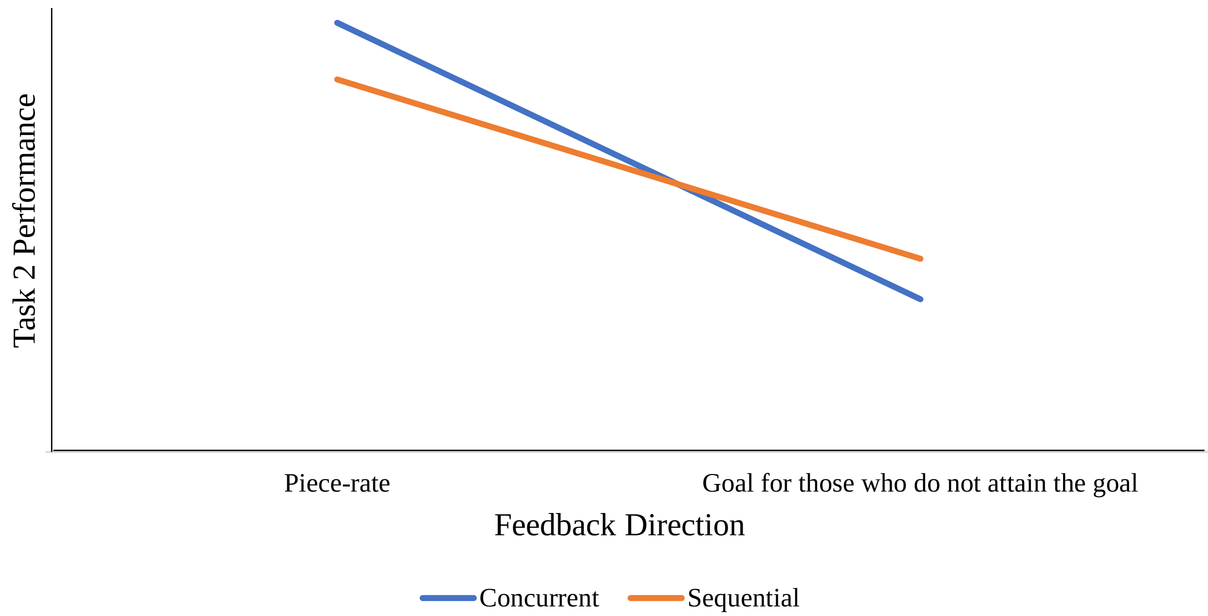
[a] See Appendix L for variable definitions.

Figure 10
Main Study - Predicted Results for H3b [a]



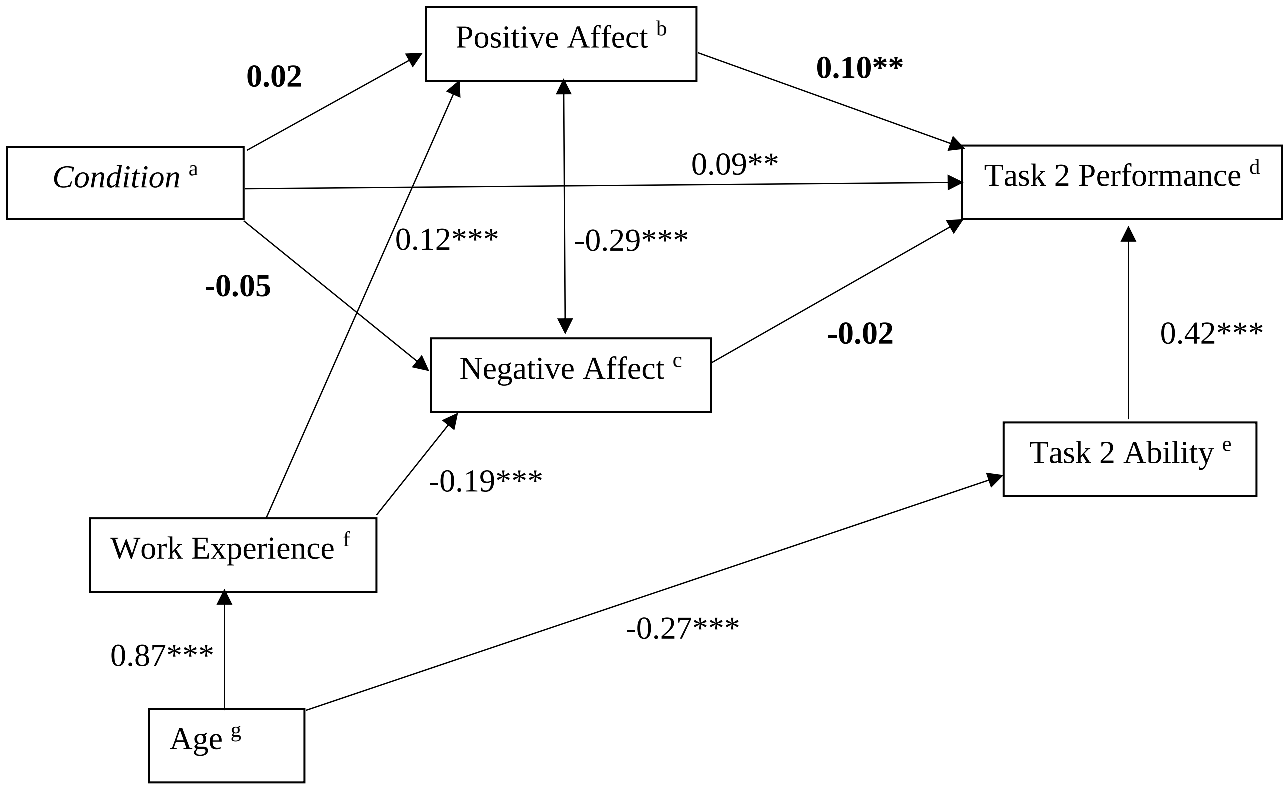
[a] See Appendix L for variable definitions.

Figure 11
Main Study - Actual Results for H3b [a]



[a] See Appendix L for variable definitions.

Figure 12
Path Analysis for Test of Theoretical Model (with Standardized Path Coefficients)



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*, **, *** Indicates significant p-value ≤ 0.10, p-value ≤ 0.05 and p-value ≤ 0.01, respectively. All p-values are two-tailed in Figure 12, unless bolded. If the finding is consistent with a directional prediction in the theoretical model, then the p-value is reported as one-tailed and bolded.

[a] The *Goal*/*Sequential* condition for those who attain the goal is coded as 1, and the *Goal/Concurrent* condition for those who attain the goal; the *Piece-rate*/*Concurrent* condition; and the *Piece-rate*/*Sequential* condition) are coded as 0.

[b] *Positive Affect* represents the combined level of agreement on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree) to ten affect measures: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active.

[c] *Negative Affect* represents the combined level of agreement on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree) to ten affect measures: distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid.

[d] *Task 2 Performance* refers to performance on the decode (unincentivized) task during the production rounds.

[e] *Task 2 Ability* refers to performance on the one-minute practice period on the decode task.

[f] *Work Experience* refers to the cumulative number of years of full-time and part-time work experience reported by the participant in the post-experimental questionnaire.

[g] *Age* refers to the age (in years) reported by the participants in the post-experimental questionnaire.

TABLES

Table 1
Pilot Study - Affect Factor Loadings (N = 582)

Affect Variable from the PANAS [a]	**Positive Affect [b] Factor Loading (α = 0.93)**	**Negative Affect [c] Factor Loading (α = 0.94)**
Interested (+)	**0.69**	-0.21
Excited (+)	**0.80**	-0.11
Strong (+)	**0.82**	-0.20
Enthusiastic (+)	**0.85**	-0.19
Proud (+)	**0.80**	0.20
Alert (+)	**0.47**	-0.10
Inspired (+)	**0.84**	-0.12
Determined (+)	**0.77**	-0.24
Attentive (+)	**0.64**	-0.19
Active (+)	**0.70**	-0.05
Distressed (-)	-0.33	**0.79**
Upset (-)	-0.40	**0.74**
Guilty (-)	-0.15	**0.71**
Scared (-)	-0.06	**0.81**
Hostile (-)	-0.15	**0.67**
Irritable (-)	-0.36	**0.72**
Ashamed (-)	-0.24	**0.76**
Nervous (-)	-0.13	**0.80**
Jittery (-)	-0.06	**0.69**
Afraid (-)	-0.05	**0.83**

[a] Refer to Appendix D for a full description of the PANAS affect measures.
[b] Refer to Figure 2 for variable definition.
[c] Refer to Figure 3 for variable definition.
α represents the Chronbach's alpha for the two latent factors

Table 2
Pilot Study - Descriptive Statistics for *Positive Affect* and *Negative Affect*

Vignette Condition [a]	Positive Affect [b] Mean (Standard Deviation)	Negative Affect [c] Mean (Standard Deviation)	N
Positive Self-Reflection (+)	33.21 (8.79)	14.89 (7.66)	90
Negative Self-Reflection (-)	29.09 (7.94)	21.82 (9.74)	93
Course Success (+)	38.89 (7.97)	14.89 (7.24)	102
Course Failure (-)	24.04 (9.24)	27.52 (9.82)	98
Goal Attainment (+)	35.51 (8.56)	13.38 (5.61)	101
Goal Failure (-)	25.42 (8.30)	20.79 (7.87)	98

[a] Refer to Figure 2 and 3 for variable definitions.
[b] Refer to Figure 2 for variable definition. *Positive Affect* is positively correlated with the positive affect factor score derived from the factor analysis (untabualted: $r = 0.98$, p-value < 0.01; two-tailed). Refer to Appendix D for a full description of the PANAS affect measures.
[c] Refer to Figure 3 for variable definition. *Negative Affect* is positively correlated with the negative affect factor score (untabulated: $r = 0.97$, p-value < 0.01; two-tailed) derived from the factor analysis. Refer to Appendix D for a full description of the PANAS affect measures.

Table 3
Pilot Study - The Effect of Vignette Condition on *Positive Affect* [a]

Panel A: Analysis of Variance (ANOVA) (N = 582)

Source of Variation	df	MS	F-statistic	p-value [b]
Affect Sign [a]	1	13628.61	189.66	< 0.01
Vignette [a]	2	52.45	0.73	0.48
Affect Sign*Vignette	2	1375.99	19.15	< 0.01

Panel B: Simple Effects by *Vignette* [c]

Vignette Conditions Compared [a]	Contrast	Std. Error	t-stat	p-value [b]
Positive Self-Reflection (+) vs. Negative Self-Reflection (-) (n = 183)	4.13	1.25	3.29	0.01
Course Success (+) vs. Course Failure (-) (n = 200)	14.85	1.19	12.39	< 0.01
Goal Attainment (+) vs. Goal Failure (-) (n = 199)	10.09	1.20	8.39	< 0.01

Panel C: Simple Effects between *Vignettes* [c]

Vignettes Conditions Compared [a]	Contrast	Std. Error	t-stat	p-value [b]
Positive Self-Reflection (+) vs. Course Success (+) (n =192)	-5.68	1.23	4.63	< 0.01
Positive Self-Reflection (+) vs. Goal Attainment (+) (n = 191)	-2.29	1.23	1.87	0.42
Course Success (+) vs. Goal Attainment (+) (n = 203)	3.39	1.19	2.85	0.05

[a] Refer to Figure 2 for variable definitions. Refer to Appendix D for a full description of the PANAS affect measures.
[b] Reported *p*-values are two-tailed.
[c] Simple effects tests are adjusted for multiple comparisons using the Tukey test (Howell 2013).

Table 4
Pilot Study - The Effect of Vignette Condition on *Negative Affect* [a]

Panel A: Analysis of Variance (ANOVA) (N=582)

Source of Variation	df	MS	F-statistic	p-value [b]
Affect Sign [a]	1	11732.88	178.97	< 0.01
Vignette [a]	2	888.20	13.55	< 0.01 [c]
Affect Sign*Vignette	2	489.85	7.47	< 0.01

Panel B: Simple Effects by *Vignette* [d]

Vignette Conditions Compared [a]	Contrast	Std. Error	t-stat	p-value [b]
Negative Self-Reflection (-) vs. Positive Self-Reflection (+) (n = 183)	6.93	1.20	5.79	< 0.01
Course Failure (-) vs. Course Success (+) (n = 200)	12.63	1.15	11.03	< 0.01
Goal Failure (-) vs. Goal Attainment (+) (n = 199)	7.409	1.15	6.45	< 0.01

Panel C: Simple Effects between *Vignettes* [d]

Vignette Conditions Compared [a]	Contrast	Std. Error	t-stat	p-value [b]
Negative Self-Reflection (-) vs. Course Failure (-) (n = 191)	-5.70	1.17	4.87	< 0.01
Negative Self-Reflection (-) vs. Goal Failure(-) (n = 191)	1.03	1.17	0.88	0.95
Course Failure (-) vs. Goal Failure (-) (n = 196)	6.73	1.16	5.82	< 0.01

[a] Refer to Figure 3 for variable definitions. Refer to Appendix D for a full description of the PANAS affect measures.
[b] Reported *p*-values are two-tailed.
[c] A significant main effect for *Vignette* shows significant differences (untabulated) between the *Self-Reflection* and the *Course* vignette (*p*-value < 0.01; two-tailed) and between the *Course* and the *Goal* vignette (p-value < 0.01; two-tailed), no significant difference between *the Self-Reflection* and the *Goal* vignette (*p*-value = 0.28; two-tailed).
[d] Simple effects tests are adjusted for multiple comparisons using the Tukey test (Howell 2013).

Table 5
Main Study - Number of Participants in Each Condition [N=511] [a]

	Task Temporality		
Task 1 Contract Type	Concurrent	Sequential	**Total (N)**
Piece-rate	94	88	**182**
Goal	162	167	**329**
Total	**256**	**255**	**511**

[a] See Appendix L for variable definitions.

Table 6
Main Study - Correlation Table for *Task 1 Contract Type* Conditions [N = 511] [a]

	Positive Affect	Negative Affect	Total Affect	Self-Efficacy	Task 1 Ability	Task 2 Ability	Task 1 Performance
Positive Affect							
Negative Affect	-0.39**						
Total Affect	0.57**	0.53**					
Self-Efficacy	0.50**	-0.37**	0.14**				
Task 1 Ability	0.15**	-0.06	0.08*	0.04			
Task 2 Ability	0.07	-0.03	0.04	0.03	0.39**		
Task 1 Performance	0.21	-0.15**	0.06	0.12**	0.43**	0.31**	
Task 2 Performance	0.16**	-0.06	0.10**	0.06	0.30**	0.47**	0.33**

[a] See Appendix L for variable definitions
**means that the correlation is significant at p-value $\leq$ 0.05; two-tailed.
*means that the correlation is significant at p-value $\leq$ 0.10; two-tailed.

Table 7
Main Study - Test for H1 and H2: The Effects of *Incentive Type* and *Task Temporality* on *Total Affect* [a]

Panel A: Mean (Standard Deviation) *Total Affect* [N = 511]

	Total Affect
Overall	
Piece-rate	69.80 (12.25)
	n = 182
Goal	71.70 (14.30)
	n = 329
Average	71.03 (13.62)
	N = 511
Concurrent	
Piece-rate	70.03 (12.18)
	n = 94
Goal	72.59 (14.03)
	n = 162
Average	71.65 (13.41)
	n = 256
Sequential	
Piece-rate	69.56 (12.38)
	n = 88
Goal	70.84 (14.55)
	n = 167
Average	70.40 (13.83)
	n = 255

Panel B: Analysis of Variance [N=511]

Source	df	MS	F-Statistic	p-value [b]
Task 1 Contract Type	1	432.12	2.33	**0.06**
Task Temporality	1	145.48	0.78	0.38
Task 1 Contract Type*Task Temporality	1	47.90	0.26	0.61
Residual	507	185.37		
Total	510	185.63		

[a] See Appendix L for variable definitions.
[b] H1 is a directional prediction. Thus, the bolded p-value is shown as one-tailed, if consistent with the prediction. The one-tailed p-value reported is consistent with the t-test result. Reported p-values that are not bolded are two-tailed.

Table 8
Main Study - Test for H3a: The Effects *Feedback Direction* and *Task Temporality* on *Task 2 Performance* [a]

Panel A: Covariate Adjusted Mean (Standard Error) *Task 2 Performance* [n = 341] [b]

	Task 2 Performance
Overall	
Piece-rate	44.52 (0.83)
	n = 182
Goal for those who attain the goal	45.80 (0.89)
	n = 159
Average	45.15 (0.60)
	n = 341
Concurrent Temporality	
Piece-rate	44.78 (1.15)
	n = 94
Goal for those who attain the goal	44.39 (1.28)
	n = 76
Average	44.39 (0.85)
	n = 170
Sequential Temporality	
Piece-rate	44.26 (1.18)
	n = 88
Goal for those who attain the goal	47.20 (1.22)
	n = 83
Average	45.90 (0.85)
	n = 171

Panel B: Analysis of Covariance [n = 341]

Source	df	MS	F-statistic	p-value [c]
Feedback Direction	1	132.54	1.08	0.30
Task Temporality	1	110.42	0.90	0.34
Feedback Direction*Task Temporality	1	232.94	1.90	0.17
Task 2 Ability	1	9199.05	75.05	< 0.01
Residual	336	122.57		
Total	340	151.53		

Table 8 Continued

Panel C: Planned Contrast for H3a

Contrast	Contrast Coefficient	Std. Error	t-Statistic	p-value [d]
1. (H3a): Goal/Sequential for those who attain the goal > Goal /Concurrent for those who attain the goal + Piece-rate/Concurrent + Piece-rate/Sequential	8.15	4.21	1.93	**0.03**

[a] See Appendix L for variable definitions
[b] The means are adjusted for the covariate *Task 2 Ability* included in the model.
[c] Reported p-values are two-tailed due to the nature of the ordinal interaction predicted for H3a.
[d] H3a is a directional prediction. Thus, for contrast testing the bolded p-value is shown as one-tailed, if consistent with the prediction. If the results are in the opposite direction of the prediction, the p-value is shown as two-tailed and not bolded.

Table 9
Main Study - Test for H3b: The Effects *Feedback Direction* and *Task Temporality* on *Task 2 Performance* [a]

Panel A: Covariate Adjusted Mean (Standard Error) for *Task 2 Performance* [n = 352] [b]

	Task 2 Performance
Overall	
Piece-rate	42.97 (0.74) n = 182
Goal for those who do not attain the goal	40.98 (0.76) n = 170
Average	42.02 (0.53) n = 352
Concurrent Temporality	
Piece-rate	43.21 (1.02) n = 94
Goal for those who do not attain the goal	40.82 (1.07) n = 86
Average	42.06 (0.74) n = 180
Sequential Temporality	
Piece-rate	42.72 (1.06) n = 88
Goal for those who do not attain the goal	41.17 (1.09) n = 84
Average	41.97 (0.76) n = 172

Table 9 Continued

Panel B: Analysis of Covariance [n = 352]

Source	df	MS	F-statistic	p-value [c]
Feedback Direction	1	335.51	3.41	0.07
Task Temporality	1	0.42	0.00	0.95
Feedback Direction*Task Temporality	1	15.27	0.16	0.69
Task 2 Ability	1	9092.12	92.51	< 0.01
Residual	347	98.28		
Total	351	125.97		

[a] See Appendix L for variable definitions
[b] The means are adjusted for the covariate *Task 2 Ability* included in the model.
[c] Reported p-values are two-tailed due to the nature of the ordinal interaction predicted for H3b.

Table 10
Main Study - Supplemental Test for H1 and H2: The Effects of *Task 1 Contract Type* and *Task Temporality* on *Positive Affect* and *Negative Affect* [a]

Panel A: Mean (Standard Deviation) *Positive Affect* [N = 511]

	Positive Affect
Overall	
Piece-rate	52.54 (10.85) n =182
Goal	47.25 (12.95) n = 329
Average	49.13 (12.49) N = 511
Concurrent	
Piece-rate	52.11 (10.41) n = 94
Goal	47.88 (12.00) n = 162
Average	49.43 (11.60) n = 256
Sequential	
Piece-rate	53.01 (11.34) n = 88
Goal	46.63 (13.82) n = 167
Average	48.84 (13.35) n = 255

Table 10 Continued

Panel B: Mean (Standard Deviation) *Negative Affect* [N = 511]

	Negative Affect
Overall	
Piece-rate	17.26 (9.47) n = 182
Goal	24.46 (12.62) n = 329
Average	21.89 (12.09) N = 511
Concurrent	
Piece-rate	17.93 (10.45) n = 94
Goal	24.72 (12.03) n = 162
Average	22.22 (11.92) n = 256
Sequential	
Piece-rate	16.55 (8.29) n = 88
Goal	24.20 (13.20) n = 167
Average	21.56 (12.28) n = 255

Panel C: Mixed Factorial ANOVA [N = 511]

Source	df	MS	F-Statistic	p-value [b]
Between Subject Effects				
Task 1 Contract Type	1	216.06	2.33	**0.06**
Task Temporality	1	72.74	0.79	0.38
Task 1 Contract Type*Task Temporality	1	23.95	0.26	0.61
Error	507	92.58		
Within Subject Effects				
Affect Type	1	197749.67	1027.28	< 0.01
Task 1 Contract Type*Affect Type	1	9187.76	47.73	< 0.01
Task Temporality*Affect Type	1	35.42	0.18	0.69
Task 1 Contract Type*Affect Type*Task Temporality	1	132.99	0.69	0.41
Error	507			

Table 10 Continued

Panel D: Pairwise Comparisons for *Positive Affect* between *Task 1 Contract Type*

Comparison	Mean Difference in Positive Affect	Std. Error	t-Statistic	p-value [b]
1. (H1): Piece-rate – Goal	5.30	1.13	4.93	< 0.01

Panel E: Pairwise Comparisons for *Negative Affect* between *Task 1 Contract Type*

Comparison	Mean Difference in Negative Affect	Std. Error	t-Statistic	p-value [b]
2. (H1): Piece-rate – Goal	-7.20	1.07	-7.28	**< 0.01**

[a] See Appendix L for variable definitions.
[b] H1 is a directional prediction. Thus, the bolded p-value is shown as one-tailed, if consistent with the directional prediction. The one-tailed p-value reported is consistent with the t-test result. Reported p-values that are not bolded are two-tailed.

Table 11
Main Study - Supplemental Test for H1 and H2: The Effects of *Feedback Direction and Task Temporality* on *Positive Affect* [a]

Panel A: Mean (Standard Deviation) *Positive Affect* [N = 511]

	Positive Affect
Overall	
Piece-rate	52.54 (10.85) n = 182
Goal for those who attain the goal	51.97 (10.73) n = 159
Goal for those who do not attain the goal	42.82 (13.31) n = 170
Average	49.13 (12.50) N = 511
Concurrent Temporality	
Piece-rate	52.11 (10.41) n = 94
Goal for those who attain the goal	51.47 (10.00) n = 76
Goal for those who do not attain the goal	44.70 (12.75) n = 86
Average	49.43 (11.60) n = 256
Sequential Temporality	
Piece-rate	53.01 (11.34) n = 88
Goal for those who attain the goal	52.43 (11.40) n = 83
Goal for those who do not attain the goal	40.90 (13.67) n = 84
Average	48.84 (13.35) n = 255

Table 11 Continued

Panel B: Analysis of Variance [N = 511]

Source	df	MS	F-Statistic	p-value [b]
Feedback Direction	2	5105.45	37.48	< 0.01
Task Temporality	1	52.54	0.39	0.53
Feedback Direction*Task Temporality	2	316.24	2.32	0.10
Residual	505	136.21		
Total	510	156.16		

Table 11 Continued

Panel C: Pairwise Comparisons with Tukey Correction [c]

Comparison	Coefficient	Std. Error	t-Statistic	p-value [d]
1. (H1): Goal /Concurrent for those who attain the goal – Piece-rate/Concurrent	-0.63	1.80	-0.35	1.00
2. (H1): Goal/Concurrent for those who attain the goal – Goal/Concurrent for those who do not attain the goal	6.78	1.84	3.69	< 0.01
3. (H1): Piece-rate/Concurrent - Goal/Concurrent for those who do not attain the goal	7.41	1.74	4.25	< 0.01
4. (H1/H2): Goal/Sequential for those who attain the goal – Piece-rate/Sequential	-0.58	1.79	-0.32	1.00
5. (H1/H2): Goal/Sequential for those who attain the goal – Goal/Sequential for those who do not attain the goal	11.53	1.81	6.38	**< 0.01**
6. (H1/H2): Piece-rate/Sequential - Goal/Sequential for those who do not attain the goal	12.11	1.78	6.80	< 0.01
7. (H2): Piece-rate/Sequential - Piece-rate/Concurrent	0.91	1.73	0.52	1.00
8. (H2): Goal/Sequential for those who attain the goal – Goal/Concurrent for those who do attain the goal	0.96	1.85	0.52	**0.50**
9. (H2): Goal/Sequential for those who do not attain the goal – Goal/Concurrent for those who do not attain the goal	-3.79	1.79	-2.12	0.28

[a] See Appendix L for variable definitions.
[b] The p-value reported for the 3 x 2 ANOVA are two-tailed.
[c] The pairwise comparisons are adjusted using the Tukey test, which is more a powerful test when comparing a large number of means, as is the case in a pairwise post-ANOVA test, compared to the Bonferroni test (Howell 2013).
[d] Reported p-values for the supplemental analysis are two-tailed, unless the result is consistent with a directional prediction, then the p-value is shown as one-tailed and bolded.

Table 12
Main Study - Supplemental Test for H1 and H2: The Effects of *Feedback Direction and Task Temporality* on *Negative Affect* [a]

Panel A: Mean (Standard Deviation) *Negative Affect* [N = 511]

	Negative Affect
Overall	
Piece-rate	17.26 (9.47) n = 182
Goal for those who attain the goal	20.94 (10.84) n = 159
Goal for those who do not attain the goal	27.75 (13.30) n = 170
Average	21.89 (12.09) N = 511
Concurrent Temporality	
Piece-rate	17.93 (10.45) n = 94
Goal for those who attain the goal	23.86 (11.99) n = 76
Goal for those who do not attain the goal	25.48 (12.09) n = 86
Average	22.22 (11.92) n = 256
Sequential Temporality	
Piece-rate	16.55 (8.29) n = 88
Goal for those who attain the goal	18.27 (8.94) n = 83
Goal for those who do not attain the goal	30.07 (14.12) n = 84
Average	21.56 (12.28) n = 255

Table 12 Continued

Panel B: Analysis of Variance [N = 511]

Source	**df**	**MS**	**F-Statistic**	**p-value** [b]
Feedback Direction	2	4965.98	40.14	< 0.01
Task Temporality	1	79.78	0.64	0.42
Feedback Direction*Task Temporality	2	1080.52	8.73	< 0.01
Residual	505	123.71		
Total	510	146.23		

Panel C: Pairwise Comparisons with Tukey Correction [c]

Comparison	**Coefficient**	**Std. Error**	**t-Statistic**	**p-value** [d]
1. (H1): Goal/Concurrent for those who do not attain the goal – Piece-rate/Concurrent	7.55	1.66	4.55	< 0.01
2. (H1): Goal/Concurrent for those who do not attain the goal – Goal/Concurrent for those who attain the goal	1.62	1.75	0.93	0.94
3. (H1): Piece-rate/Concurrent - Goal/Concurrent for those who attain the goal	-5.30	1.72	-3.46	0.01
4. (H1/H2): Goal/Sequential for those who do not attain the goal – Piece-rate/Sequential	13.53	1.70	7.97	**< 0.01**
5. (H1/H2): Goal/Sequential for those who do not attain the goal – Goal/Sequential for those who attain the goal	11.81	1.72	6.86	**< 0.01**
6. (H1/H2): Piece-rate/Sequential - Goal/Sequential for those who attain the goal	-1.72	1.70	-1.01	0.91
7. (H2): Piece-rate/Sequential - Piece-rate/Concurrent	-1.38	1.65	-0.84	0.96
8. (H2): Goal/Sequential for those who do not attain the goal – Goal/Concurrent for those who do not attain the goal	4.59	1.71	2.69	**0.04**
9. (H2): Goal/Sequential for those who attain the goal – Goal/Concurrent for those who attain the goal	-5.59	1.77	-3.17	**0.01**

Table 12 Continued

[a] See Appendix L for variable definitions.
[b] The p-value reported for the 3 x 2 ANOVA are two-tailed.
[c] The pairwise comparisons are adjusted using the Tukey test, which is more a powerful test when comparing a large number of means, as is the case in a pairwise post-hoc test, compared to the Bonferroni test (Howell 2013).
[d] Reported p-values for the supplemental analysis are two-tailed, unless the result is consistent with a directional prediction, then the p-value is shown as one-tailed and bolded.

Table 13
Main Study - Supplemental Test for H1: The Effects of *Goal Commitment* and *Feedback Direction* on *Positive Affect and Negative Affect* [a]

Panel A: Covariate Adjusted Mean (Standard Error) *Positive Affect* [n = 329]

	Positive Affect
Low Goal Commitment for those who attain the goal	47.57 (1.36) n = 84
Low Goal Commitment for those who do not attain the goal	36.28 (1.47) n = 73
Average for Low Goal Commitment	41.92 (1.00) n = 157
High Goal Commitment for those who attain the goal	56.05 (1.39) n = 75
High Goal Commitment for those who do not attain the goal	47.37 (1.25) n = 97
Average for High Goal Commitment	51.71 (0.94) n = 172
Overall Average	47.15 (0.63) n = 329

Panel B: Covariate Adjusted Mean (Standard Error) *Negative Affect* [n = 329]

	Negative Affect
Low Goal Commitment for those who attain the goal	21.62 (1.48) n = 84
Low Goal Commitment for those who do not attain the goal	28.99 (1.59) n = 73
Average for Low Goal Commitment	25.30 (1.09) n = 157
High Goal Commitment for those who attain the goal	19.98 (1.51) n = 75
High Goal Commitment for those who do not attain the goal	27.68 (1.36) n = 97
Average for High Goal Commitment	23.83 (1.02) n = 172
Overall Average	24.34 (0.68) n = 329

Table 13 Continued

Panel C: Mixed Factorial ANCOVA [n = 329]

Source	df	MS	F-Statistic	p-value [b]
Between Subject Effects				
Goal Commitment	1	867.54	9.10	<0.01
Feedback Direction	1	35.10	0.37	0.55
Task 1 Ability	1	95.78	1.00	0.32
Goal Commitment*Feedback Direction	1	13.76	0.14	0.70
Goal Commitment*Task 1 Ability	1	7.37	0.08	0.78
Feedback Direction*Task 1 Ability	1	6.08	0.06	0.80
Goal Commitment* Feedback Direction*Task 1 Ability	1	100.82	1.06	0.31
Error	321	95.37		
Within Subject Effects				
Affect Type	1	22805.75	125.89	<0.01
Affect Type*Goal Commitment	1	871.70	4.81	0.03
Affect Type*Feedback Direction	1	1916.81	10.58	<0.01
Affect Type*Task 1 Ability	1	45.58	0.25	0.62
Affect Type*Goal Commitment*Feedback Direction	1	0.77	0.00	0.95
Affect Type*Goal Commitment*Task 1 Ability	1	72.92	0.40	0.53
Affect Type*Feedback Direction*Task 1 Ability	1	250.03	1.38	0.24
Affect Type*Goal Commitment* Feedback Direction*Task 1 Ability	1	28.96	0.16	0.69
Error	321	181.16		

Table 13 Continued

Panel D: Pairwise Comparison of Marginal Means for *Positive Affect* between *Goal Commitment* [c]

Comparison	Mean Difference in *Positive Affect*	Std. Error	t-Statistic	p-value [d]
1. (H1): High Goal Commitment – Low Goal Commitment	9.79	1.37	7.15	**< 0.01**

Panel E: Pairwise Comparison of Marginal Means for *Negative Affect* between *Goal Commitment* [c]

Comparison	Mean Difference in *Negative Affect*	Std. Error	t-Statistic	p-value [d]
2. (H1): High Goal Commitment – Low Goal Commitment	-1.47	1.49	-0.99	0.32

[a] See Appendix L for variable definitions.
[b] Reported p-values for the mixed factorial ANCOVA are two-tailed.
[c] Reported p-values for the supplemental analysis are two-tailed, unless the result is consistent with a directional prediction, then the p-value is shown as one-tailed and bolded. If the results are in the opposite direction of the prediction, the p-value is shown as two-tailed and not bolded.
[d] Pairwise comparisons adjusted for multiple comparisons using the Bonferroni test (Howell 2013).

Table 14
Main Study - Supplemental Test for H3a: The Effects of *Goal Commitment* on *Task 2 Performance* [a]

Panel A: Covariate Adjusted Mean (Standard Error) *Task 2 Performance* [n = 159]

	Task 2 Performance
Overall	
Low Goal Commitment for those who attain the goal	45.79 (1.33) n = 84
High Goal Commitment for those who attain the goal	48.06 (1.41) n = 75
Average	46.86 (0.97) n = 159
Concurrent Temporality	
Low Goal Commitment for those who attain the goal	45.48 (1.40) n = 39
High Goal Commitment for those who attain the goal	45.29 (1.40) n = 37
Average	45.39 (1.40) n = 76
Sequential Temporality	
Low Goal Commitment for those who attain the goal	48.30 (1.34) n = 45
High Goal Commitment for those who attain the goal	48.11 (1.33) n = 38
Average	48.21 (1.34) n = 83

Table 14 Continued

Panel B: Analysis of Variance [n = 159]

Source	**df**	**MS**	**F-Statistic**	**p-value** [b]
Goal Commitment for those who attain the goal	1	221.16	1.48	0.22
Task Temporality	1	327.28	2.20	**0.07**
Goal Commitment for those who attain the goal* Task Temporality	1	3.66	0.02	0.88
Task 2 Ability	1	4682.34	31.41	< 0.01
Residual	154	149.09		
Total	158	178.46		

[a] See Appendix L for variable definitions.
[b] Reported p-values for the ANCOVA are two-tailed, unless the result is consistent with a directional prediction, then the p-value is shown as one-tailed and bolded. The one-tailed p-values reported are consistent with the t-test result. If the results are in the opposite direction of the prediction, the p-value is shown as two-tailed and not bolded.

Table 15
Path Analysis for Theoretical Model (N = 511) [a]

Standardized Path Model	Standardized Coefficient	Bootstrapped Standard Error [b]	z-Statistic	p-value [c]
Condition [d] -> Positive Affect	0.02	0.06	0.32	**0.38**
Work Experience -> Positive Affect	0.12	0.05	2.27	0.02
Condition -> Negative Affect	-0.05	0.05	-1.17	**0.12**
Work Experience -> Negative Affect	-0.19	0.05	-3.83	<0.01
Positive Affect -> Task 2 Performance	0.10	0.06	1.64	**0.05**
Negative Affect -> Task 2 Performance	-0.02	0.06	-0.32	**0.37**
Condition -> Task 2 Performance	0.09	0.05	2.06	0.04
Task 2 Ability -> Task 2 Performance	0.42	0.06	7.06	<0.01
Age -> Task 2 Ability	-0.27	0.04	-5.91	<0.01
Age -> Work Experience	0.87	0.03	32.80	<0.01
Positive Affect <-> Negative Affect	-0.29	0.06	-4.85	<0.01

[a] See Appendix L for variable definitions.
[b] I bootstrap the standard errors using 10,000 bootstrap repetitions following Hayes (2013).
[c] Reported p-values for the path model are two-tailed, unless the result is consistent with a directional prediction, then the p-value is shown as one-tailed and bolded. If the results are in the opposite direction of the prediction, the p-value is shown as two-tailed and not bolded.
[d] Condition refers to participants in the *Goal/Sequential* condition who attain the goal coded as 1 versus the *Goal*/*Concurrent* condition who attain the goal; *Piece-rate*/*Concurrent* condition; *Piece-rate*/*Sequential* condition, all coded as 0.

Table 16
Summary of Main Study Results [a]

Test	**Support (Yes/No/Mixed)**	**Summary of Key Findings**	**References**
H1 Main Test	Yes	*Total Affect* is marginally significantly greater for participants in the *Goal* condition versus the *Piece-rate* condition.	Table 7, Panel B; Figure 7
H1 Supplemental Test 1 - *The Effect of Task 1 Contract Type on Positive Affect and Negative Affect*	Mixed	*Positive Affect* is significantly greater for participants in the *Piece-rate* condition compared to the *Goal* condition. *Negative Affect* is significantly greater for participants in the *Goal* condition versus the *Piece-rate* condition.	Table 10, Panel C, Panel D and Panel E
H1 Supplemental Test 2 - *The Effect of Feedback Type on Positive Affect and Negative Affect*	Mixed	*Positive Affect* is not significantly greater for participants in the *Goal* condition who attain the goal versus the *Piece-rate* condition. *Negative Affect* is significantly greater for participants in the *Goal* condition who do not attain the goal versus the *Piece-rate* condition.	Table 11, Panel B, Panel C Table 12, Panel B, Panel C
H1 Supplemental Test 3 - *The Effect of Goal Commitment on Positive and Negative Affect*	Mixed	No significant *Goal Commitment* x *Feedback Direction* interaction found. *Positive Affect* is greater for participants with *High Goal Commitment* versus *Low Goal Commitment*. *Negative Affect* is not greater for participants with *High Goal Commitment* versus *Low Goal Commitment*.	Table 13, Panel C, Panel D

Table 16 Continued

H2 Main Test	No	*Task Temporality* does not moderate the effect of *Task 1 Contract Type* on *Total Affect*.	Table 7, Panel B; Figure 7
H2 Supplemental Test 1 - *The Moderating Effect of Task Temporality on Positive Affect*	Mixed	A marginally significant *Feedback Direction x Task Temporality* interaction is found on *Positive Affect.* *Positive Affect* is not greater for participants in the *Goal/Sequential* condition who attain the goal versus the *Goal/Concurrent* condition who attain the goal. *Positive Affect* is not greater for participants in the *Goal/Sequential* condition who attain the goal versus the *Piece-rate/Sequential* condition. *Positive Affect* is significantly greater for participants in the *Goal* condition who attain the goal versus participants in the *Goal* condition who do not attain the goal under both *Sequential* and *Concurrent* temporality. *Positive Affect* is not lower for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Goal/Concurrent* condition who do not attain the goal. *Positive Affect* is lower for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Piece-rate/Sequential* condition.	Table 11, Panel B, Panel C

Table 16 Continued

H2 Supplemental Test 2 - *The Moderating Effect of Task Temporality on Negative Affect*	Yes	A significant *Feedback Direction x Task Temporality* interaction is found on *Negative Affect.* *Negative Affect* is greater for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Goal/Concurrent* condition who do not attain the goal. *Negative Affect* is greater for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Piece-rate/Sequential* condition. *Negative Affect* is greater for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Goal/Sequential* condition who do attain the goal. *Negative Affect* is not greater for participants in the *Goal/Concurrent* condition who do not attain the goal versus the *Goal/Concurrent* condition who do attain the goal. *Negative Affect* is lower for participants in the *Goal/Sequential* condition who attain the goal versus the *Goal/Concurrent* condition who attain the goal. *Negative Affect* is greater for participants in the *Goal/Sequential* condition who do not attain the goal versus the *Piece-rate/Sequential* condition. *Negative Affect* does not differ between participants in the *Goal/Sequential* condition who attain the goal versus the *Piece-rate/Sequential* condition.	Table 12, Panel B, Panel C

Table 16 Continued

H3a Main Test	Yes	Participants in the *Goal/Sequential* condition who attain the goal have significantly greater Task 2 Performance versus those in the *Piece-rate/Sequential*, *Piece-rate/Concurrent*, and the *Goal/Sequential* condition who attain the goal.	Table 8, Panel C; Figure 9
H3a Supplemental Test - *The Effect of Goal Commitment on Positive Effort Spillover*	No	No significant *Goal Commitment* x *Task Temporality* interaction is found for participants in the *Goal* condition who attain the goal.	Table 14, Panel B
H3b Main Test	No	Participants in the *Goal* condition who do not attain the goal have significantly lower *Task 2 Performance* versus those in the *Piece-rate* condition. However, *Task Temporality* does not moderate the effort spillover effect, as predicted in H3b.	Table 9, Panel B; Figure 11

[a] See Appendix L for variable definitions.

APPENDICES

Appendix A
Self-Reflection Vignette (Adapted from Gasper 2004)

***Positive Affect Condition* (*Positive Self-Reflection*)**

In the box below, please describe **in detail** a recent life event that made you feel "**happy, joyful and positive**."

In the second box, please describe why the event made you feel "**happy, joyful and positive**."

***Negative Affect Condition* (*Negative Self-Reflection*)**

In the box below, please describe **in detail** a recent life event that made you feel "**sad, upset and negative**."

In the second box, please describe why the event made you feel "**sad, upset and negative**."

Appendix B
Course Vignette (Adapted from Smith and Lazarus 1993)

***Positive Affect Condition (258 words)* (*Course Success*)**
This semester you've been taking a course that is required for your intended major. You selected this major because you've always been interested in the field, and you believe that it's ideal preparation for your career aspirations, which you've held for a long time. You've found this course to be much more difficult than you expected, and you scored well below the median on the midterm. Realizing that it was very important for you to do well on the final, you redoubled your efforts, studied as hard as you could, and frequently sought out the TAs for help. You thought that the final was difficult, but left thinking that you had done fairly well.
The grades have just been posted, and you discover that you **scored well above the median and have received a "A" on the final exam.**
Shortly after the grades are posted you receive an email message from your professor for the course that reads:

"Congratulations, you received the highest score in the class on your final examination. As a result, you have passed the course."

You now believe that you're cut out for this major. You worked as hard as you could and demonstrated that you can be successful at the course. You're certain that you should stick with your major and career plans. Right now, you're thinking about how long you've dreamed of achieving your career aspirations, how long you've been interested in this particular major, and how now get to carry out your dreams and plans. This is a great personal achievement.

***Negative Affect Condition (254 words)* (*Course Failure*)**
This semester you've been taking a course that is required for your intended major. You selected this major because you've always been interested in the field, and you believe that it's ideal preparation for your career aspirations, which you've held for a long time. You've found this course to be much more difficult than you expected, and you scored well below the median on the midterm. Realizing that it was very important for you to do well on the final, you redoubled your efforts, studied as hard as you could, and frequently sought out the TAs for help. You thought that the final was difficult, but left thinking that you had done fairly well.
The grades have just been posted, and you discover that you **scored well below the median and have received a "D" on the final exam.**
Shortly after the grades are posted you receive an email message from your professor for the course that reads:

"Unfortunately, you received the lowest score in the class on your final examination. As a result, you have failed the course."

You believe that you're not cut out for this major. You worked as hard as you could. and still you nearly flunked the course. You're certain that you should change your major and career plans. Right now, you're thinking about how long you've dreamed of achieving your career aspirations, how long you've been interested in this particular major, and how now you have to abandon these dreams and plans. This is a great personal loss.

Appendix C
Goal Vignette

***Positive Affect Condition (294 words)* (*Goal Attained*)**

You are employed by Mackenzie Health as a full-time coder as part of a team of coding specialists. As a coder, you are responsible for efficiently and accurately translating patient information from physician reports into electronic medical codes.

As a coder, you earn a fixed wage of $600 per week plus **a bonus of $300 that is only paid if you achieve your weekly production goal** based on the total number of codes that you complete. That is, if you attain the production goal you receive the full $300 bonus, but if you do not attain the production goal for the week you do not receive any bonus for the week.

Every week you meet with the lead coder on the team who provides you with a coding production goal based on average production output of the team. This week the lead coder has told you that your goal is to complete 10,000 codes for the week. Based on your production history you know that this will be a very challenging but possible goal to attain.

You work hard the first three days and determine that you have completed a total of 5,400 codes. If you continue to work at your current pace you will only complete 9,000 total codes by the end of the week and thus will not receive your bonus. You decide you need to increase your effort because the bonus is really important to you. For the final two days of the week you work extra hard.

At the end of the final day you receive an email message from the lead coder which reads:

"Congratulations, you did successfully complete your goal of 10,000 codes for the week. As such, you will receive your weekly bonus of $300."

***Negative Affect Condition (295 words)* (*Goal Failure*)**

You are employed by Mackenzie Health as a full-time coder as part of a team of coding specialists. As a coder, you are responsible for efficiently and accurately translating patient information from physician reports into electronic medical codes.

As a coder, you earn a fixed wage of $600 per week plus **a bonus of $300 that is only paid if you achieve your weekly production goal** based on the total number of codes that you complete. That is, if you attain the production goal you receive the full $300 bonus, but if you do not attain the production goal for the week you do not receive any bonus for the week.

Every week you meet with the lead coder on the team who provides you with a coding production goal based on average production output of the team. This week the lead coder has told you that your goal is to complete 10,000 codes for the week. Based on your production history you know that this will be a very challenging but possible goal to attain.

You work hard the first three days and determine that you have completed a total of 5,400 codes. If you continue to work at your current pace you will only complete 9,000 total codes by the end of the week and will not receive your bonus. You decide you need to increase your effort because the bonus is really important to you. For the final two days of the week you work extra hard.

At the end of the final day you receive an email message from the lead coder which reads:

"Unfortunately, you did not successfully complete your goal of 10,000 codes for the week. As such, you will not receive your weekly bonus of $300."

Appendix D
The PANAS (Watson et al. 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at this present moment. Use the following scale to record your answers.

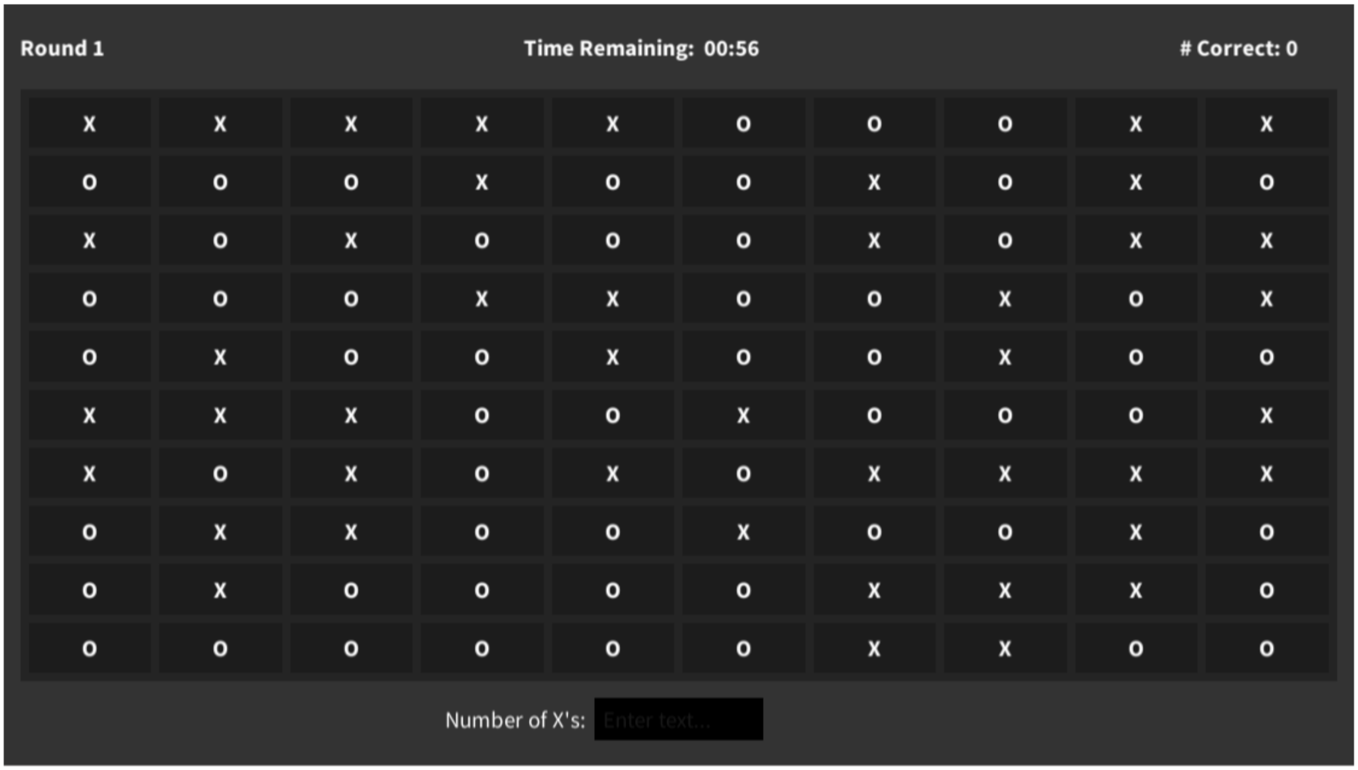
1	**2**	**3**	**4**	**5**
Very Slightly or not at all	A Little	Moderately	Quite a Bit	Extremely

_____interested (Positive)
_____distressed (Negative)
_____excited (Positive)
_____upset (Negative)
_____strong (Positive)
_____guilty (Negative)
_____scared (Negative)
_____hostile (Negative)
_____enthusiastic (Positive)
_____proud (Positive)

_____irritable (Negative)
_____alert (Positive)
_____ashamed (Negative)
_____inspired (Positive)
_____nervous (Negative)
_____determined (Positive)
_____attentive (Positive)
_____jittery (Negative)
_____active (Positive)
_____afraid (Negative)

Appendix E
Screenshot of the Letter Search Task [a]

Letter Search Task (incentivized Task 1)

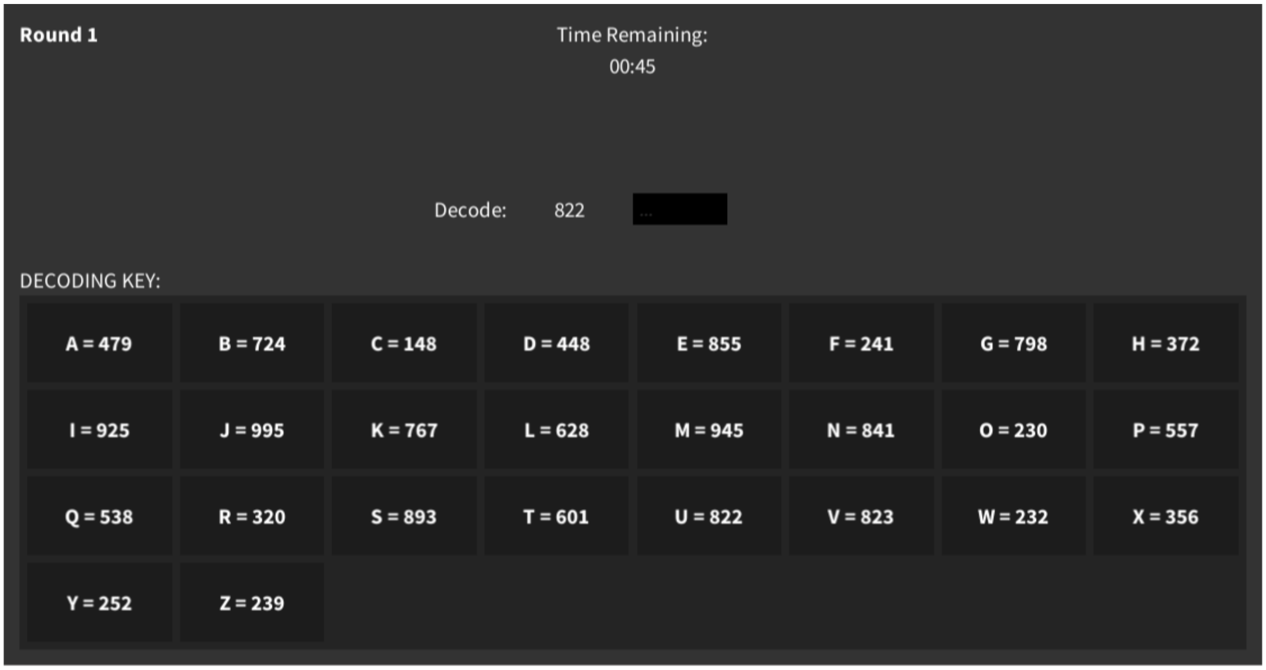


In the decode task, participants count the number of times that the letter X appears in each 10x10 grid, which consists of X's and O's.

[a] The letter search task is adapted from Choi et al. (2021).

Appendix F
Screenshot of the Decode Task [a]

Decode Task (unincentivized Task 2)



In the decode task, participants translate three-digit numbers into letters using a decoding key provided at the bottom of the computer screen.

[a] The decode task is adapted from Chow (1983).

Appendix G
Comprehension Quiz Questions

1) I will receive a fixed pay of $3.00 USD for my participation in the study.
    a. Yes
    b. No

[Correct Answer: a) Yes]

2) I will work for four production rounds.
    a. Yes
    b. No

[Correct Answer: a) Yes]

3) Each production round will last for how many minutes?
    a. 2 minutes
    b. 3 minutes
    c. 4 minutes
    d. 5 minutes

[Correct Answer: b) 3 minutes]

[Concurrent condition only]

4) During each production round, I will complete 1 minute and 30 seconds of each task.
    a. Yes
    b. No

[Correct Answer: a) Yes]

[Sequential condition only]

4) During each production round, I will complete 3 minutes of either the letter search task (in round 1 or 2) or the decode task (in round 3 and 4).
    a. Yes
    b. No

[Correct Answer: a) Yes]

[Piece-rate condition only]

5) I will receive $0.25 for each letter search grid that I complete.
    a. Yes
    b. No

[Correct Answer: a) Yes]

[Goal condition only]

5) I will receive $2.75 if I complete at least 11 letter search grids.
    a. Yes
    b. No

[Correct Answer: a) Yes]

Appendix G Continued

6) I will receive feedback about my performance on the letter search task.
    a. Yes
    b. No

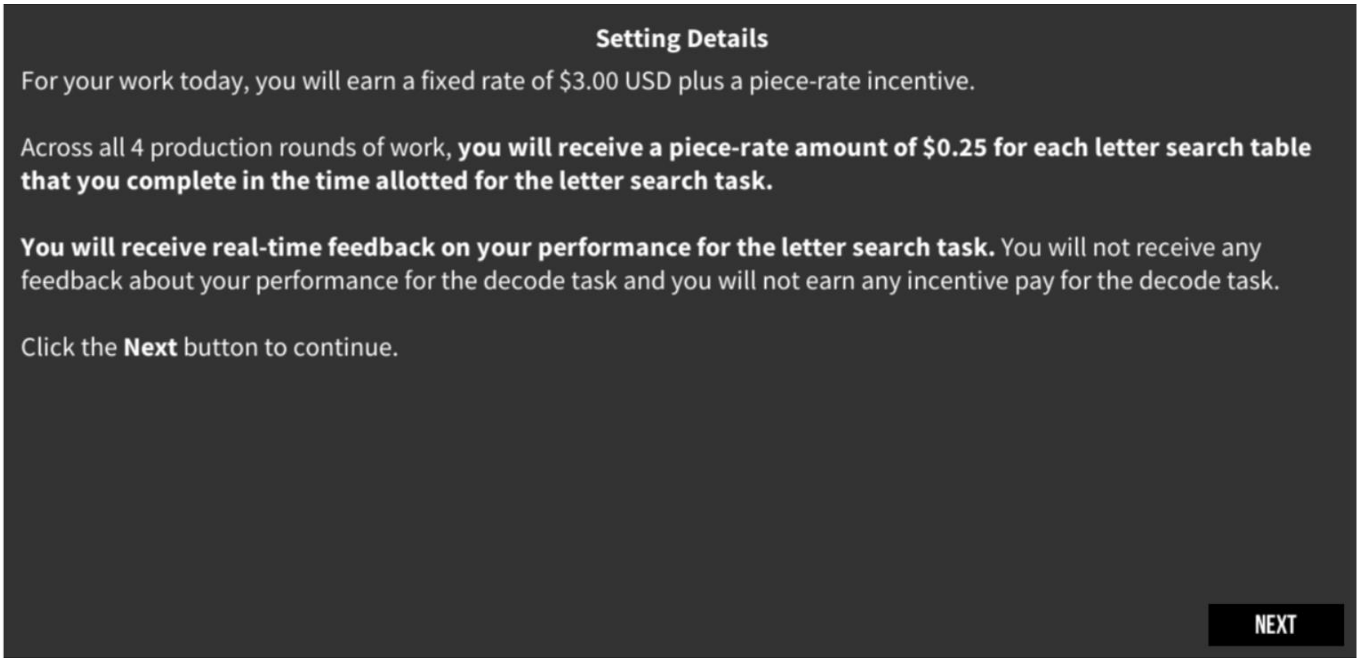
[Correct Answer: a) Yes]

7) I will not receive feedback about my performance on the decode task.
    a. Yes
    b. No

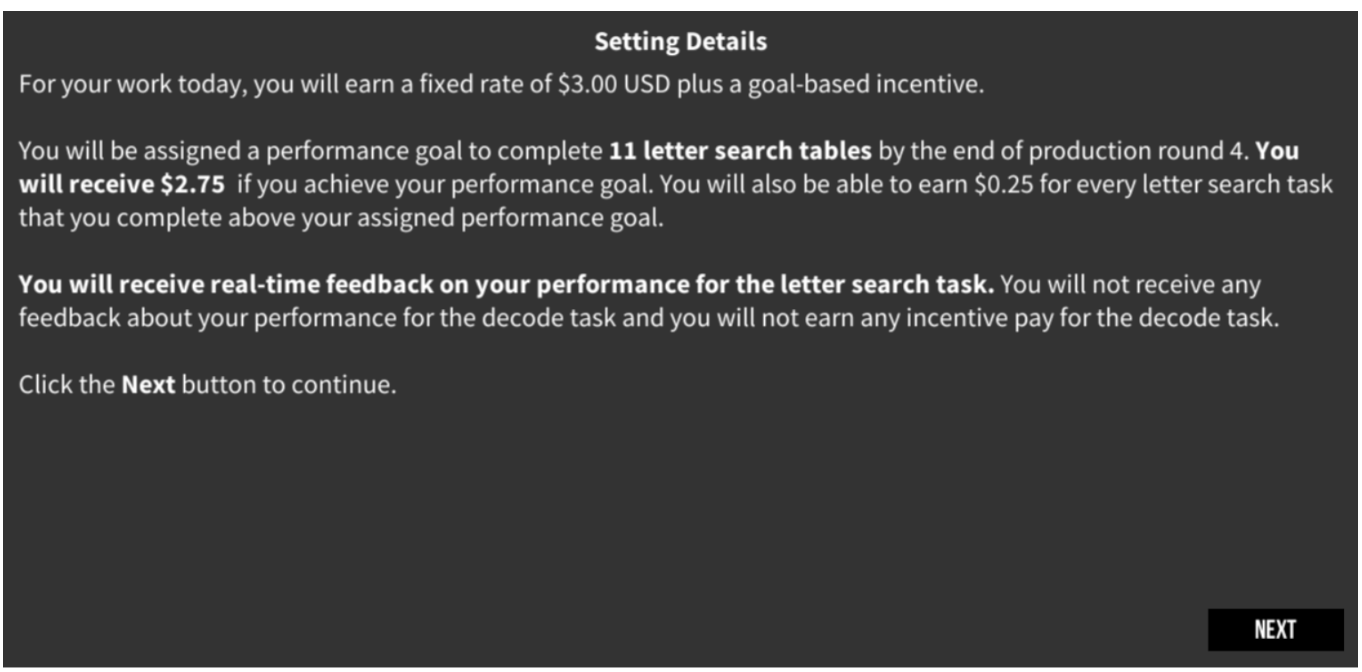
[Correct Answer: a) Yes]

Appendix H
Task 1 Contract Type Manipulation

Piece-rate Conditions [Condition 1 and 2]



Goal-based Conditions [Condition 3 and 4]



Appendix I
Goal Commitment Measure

1) Goal commitment means dedication to and responsibility to attain a particular target. How committed are you to your assigned goal? [GC1]

Not at all	Slightly	Somewhat	Moderately	Mostly	Very	Completely
1	2	3	4	5	6	7

2) To what extent do you care about your assigned goal (to complete 11 letter search grids)? [GC2]

Not at all	Slightly	Somewhat	Moderately	Mostly	Very	Completely
1	2	3	4	5	6	7

3) How dedicated are you to your assigned goal (to complete 11 letter search grids)? [GC3]

Not at all	Slightly	Somewhat	Moderately	Mostly	Very	Completely
1	2	3	4	5	6	7

4) To what extent have you chosen to be committed to your assigned goal (to complete 11 letter search grids)? [GC4]

Not at all	Slightly	Somewhat	Moderately	Mostly	Very	Completely
1	2	3	4	5	6	7

Appendix J
Self-Efficacy Measure

Please use the following scale to indicate how well each statement fits you in relation to who you are feeling right now, that is, at this present moment. There are no right or wrong answers.

1	**2**	**3**	**4**	**5**
Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely

1. I am able to achieve most of the goals that I set for myself (SE1).
2. When facing difficult tasks, I am certain that I will accomplish them (SE2).
3. In general, I think that I can obtain outcomes that are important to me (SE3).
4. I believe that I can succeed at most any endeavor to which I set my mind (SE4).
5. I will be able to successfully overcome many challenges (SE5).
6. I am confident that I can perform effectively on many different tasks (SE6).
7. Compared to other people, I can do most tasks very well (SE7).
8. Even when things are tough, I can perform quite well (SE8).

Appendix K
Post-Experimental Questionnaire

1) What is your age in years? [AGE]

2) What gender do you most identify with? [GENDER]
    a. Male
    b. Female
    c. Non-binary
    d. Prefer not to disclose

3) What is your highest level of completed education? [EDUCATION]
    a. High school diploma
    b. Technical/Community College
    c. Undergraduate degree (e.g., BA, BSc, other)
    d. Graduate degree (e.g., MA, MSc, MBA, MPhil, other)
    e. Doctoral degree (PhD)
    f. Other. Please Describe _________

4) What country do you currently reside in? ____ [COUNTRY]

5) Is English your primary language? Yes/No [LANGUAGE]

6) What is your current employment status? _______ [JOB]
    a. Full time employee (more than 35 hours per week)
    b. Part-time employee (less than 35 hours per week)
    c. Self-employed
    d. Business Owner
    e. Full-time Student
    f. Unemployed

7) How many years of work experience (full-time and part-time) do you currently have? __________ [WORK EXPERIENCE]

On average, how many hours each week do you spend playing computer and/or video games? [GAMEHOURS]

Appendix L
Main Study Variable Definitions

Affect Type – Represents the within-subject measures of Positive Affect and Negative Affect. See the definition of each above.

Age – Refers to the age (in years) reported by the participants in the post-experimental questionnaire.

Feedback Direction – Refers to the feedback message received by participants in the Piece-rate condition (coded as 0), participants in the Goal condition who attain the goal (coded as 1), and participants in the Goal condition who do not attain the goal (coded as 2).

Goal Commitment – The measure is based on adding up the responses to four measures with each measured on a 7-point Likert scale from 1 (Not at All) to 7 (Completely) for all participants in the Goal conditions: 1) Goal commitment means dedication to and responsibility to attain a particular target. How committed are you to your assigned goal (to complete 11 letter search tables)?; 2) To what extent do you care about your assigned goal (to complete 11 letter search tables)?; 3) How dedicated are you to your assigned goal (to complete 11 letter search tables)?; 4) To what extent have you chosen to be committed to your assigned goal (to complete 11 letter search tables)? These measures are adopted from Klein et al. (2014). High Goal Commitment is defined as participants that report a total Goal Commitment score above the mean score of 25.56. Low Goal Commitment is defined as participants that report a total Goal Commitment score less than the mean score of 25.56. Refer to Appendix I for details.

Goal Distance – The measure is determined by subtracting the assigned performance goal (to complete 11 letter search tables for Task 1) from Task 1 Performance. A Negative Goal Distance values means that the participant did not attain the goal. While a Positive Goal Distance value indicates that the participant did attain the goal. The greater (smaller) the value of Goal Distance the greater above the goal the participants performed. High Negative Goal Distance is defined as participants that completed less than or equal to -3 (mean Negative Goal Distance) letter search tables below the goal. Low Negative Goal Distance is defined as participants that completed less than 0 but more than 3 letter search tables below the goal. High Positive Goal Distance is defined as participants that achieve greater than or equal to 2 (mean Positive Goal Distance) over the goal. Low Positive Goal Distance is defined as participants that achieve less than or equal to 1 above the goal.

Task 1 Contract Type – The two incentive contract type conditions are Piece-rate (coded as 0) and Goal (coded as 1). Participants working under the Piece-rate incentive earn a piece-rate of $0.25 USD for each letter search grid they complete. Participants under the Goal incentive are assigned a performance goal to complete 11 letter search grids (Goal) for the incentivized letter search task and receive an incentive of $2.75 USD, respectively, if they attain the assigned goal plus $0.25 USD for every letter search grid completed above the assigned goal.

Appendix L Continued

Negative Affect – Represents the combined level of agreement on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree) to ten affect measures: distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid.

Positive Affect – Represents the combined level of agreement on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree) to ten affect measures: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active.

Self-Efficacy – The measure is based on adding up the responses to eight measures with each measured on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree): 1) I am able to achieve most of the goals that I set for myself; 2) When facing difficult tasks, I am certain that I will accomplish them; 3) In general, I think that I can obtain outcomes that are important to me; 4) I believe that I can succeed at most any endeavor to which I set my mind; 5) I will be able to successfully overcome many challenges; 6) I am confident that I can perform effectively on many different tasks; 7) Compared to other people, I can do most tasks very well; 8) Even when things are tough, I can perform quite well. The measures are adopted from Chen et al. (2001) New General Self-Efficacy (NGSE) scale. Refer to Appendix J for details.

Task 1 Ability – Performance on the one-minute practice period of the letter search task.

Task 2 Ability – Performance on the one-minute practice period of the decode task.

Task 1 Performance – Performance on the letter search (incentivized) task during the production rounds.

Task 2 Performance – Performance on the decode (unincentivized) task during the production rounds.

Task Temporality – The two Task Temporality conditions are Concurrent (coded as 0) and Sequential (coded as 1). In Concurrent temporality, participants spend 90 seconds on the letter search task (Task 1) before immediately switching to work on the decode task (Task 2) for 90 seconds. Following completion of both tasks, a new three-minute production round is started, and this process is repeated until participants have worked for a total of six minutes on each task, completing the 12-minute production period. In Sequential temporality, participants complete two, three-minute production rounds on Task 1 before beginning two, three-minute production rounds on Task 2.

Total Affect – Represents the combined 10 measures of *Negative Affect* and 10 measures of *Positive Affect* to get an overall measure of affect strength. See the definition of each above.

Work Experience – Measures the total number of years of work experience (full-time and part-time) the participant has based on each participant's response to the following post-experimental question: How many years of work experience (full-time and part-time) do you currently have?