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**THE EFFECTS OF NON-CASH INCENTIVES, PAYOFF TIMING, AND TASK TYPE ON
PERFORMANCE**

BY

GREGORY PATRICK MCPHEE

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY
ROBINSON COLLEGE OF BUSINESS

2013

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ACCEPTANCE

This dissertation was prepared under the direction of the Gregory Patrick McPhee's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctoral of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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ACKNOWLEDGEMENTS

I am grateful for the guidance and support of my dissertation committee: Lynn Hannan (co-chair), Ivo Tafkov (co-chair), Jennifer Joe and Detmar Straub. I would also like to thank Steve Fuller, Keri-Ann Gooden-Sanderson, Clive Lennox, Terence Ng, Antoinette Smith, Krishnamurthy Surysekar, Hun Tong Tan, Kim Westermann and the workshop participants at Georgia State University, Florida International University and Nanyang Technological University. I gratefully acknowledge the financial support provided by the Institute of Management Accountants Research Foundation.

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ABSTRACT

**THE EFFECTS OF NON-CASH INCENTIVES, PAYOFF TIMING, AND TASK TYPE ON
PERFORMANCE**

BY

GREGORY PATRICK MCPHEE

APRIL 17, 2013

Committee Co-Chairs: Dr. R. Lynn Hannan (Co-Chair)
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Major Academic Unit: Accounting

My study investigates whether the effects of non-cash incentives on employee performance depend on when the incentive is paid and what type of task is being performed. Although firms frequently use non-cash incentives, such as merchandise, travel awards and gift cards, the effects of non-cash incentives, relative to cash incentives, are not well understood by researchers. Drawing on economic and psychology theories, I predict that the effects of incentive type (cash or non-cash) on performance depend on incentive payoff timing (near or distant future) and task type (analytic or creative). Specifically, for an analytic task, I predict and find that a cash incentive paid in the near future is most effective. For a creative task, I predict and find that a cash incentive paid in the near future and a non-cash incentive paid in the distant future are most effective. The results of my study should benefit theory and practice by identifying the most effective combination of incentive type and payoff timing for a given task type.

I. INTRODUCTION

Research has found that up to 67 percent of firms motivate employees using non-cash incentives such as merchandise, travel awards and gift cards (Incentive Federation 2011). Despite the widespread use of non-cash incentives, little is known about how they affect employee behavior (Jeffrey 2009; Presslee et al. 2013). Because non-cash incentives are frequently used by firms but are not well understood by researchers, it is important to identify factors that influence their effectiveness compared to an economic benchmark of cash incentives. Knowing when non-cash incentives are equally as effective as cash incentives is important since non-cash incentives are often less expensive than their retail cash equivalents (Oyer 2008).

I predict that the effect of incentive type (cash or non-cash) on employee performance depends on incentive payoff timing (near or distant future) and task type (analytic or creative). When employees are performing analytic tasks, I predict that cash paid in the near future will be the most effective incentive type and payoff timing combination. When employees are performing creative tasks, I predict that cash paid in the near future and a non-cash incentive paid in the distant future will be the two most effective incentive type and payoff timing combinations. Finally, I pose the research question of whether a cash incentive with a near future payoff or a non-cash incentive with a distant future payoff is the most effective incentive type and payoff timing combination when employees are performing a creative task.

These predictions are based on economic and psychology theories. Conventional economic theory suggests that a cash incentive paid in the near future is the most effective incentive type and payoff timing combination regardless of task type (Samuelson 1937; Koopman 1960; Baker et al. 1988). Cash incentives are more effective than non-cash incentives because cash is fungible and has greater value in exchange (Baker et al. 1988). Near future

payoffs are more effective than distant future payoffs because individuals generally discount near future events less than distant future events (Samuelson 1937; Koopman 1960).

In contrast to conventional economic theory, psychology theory suggests that the effect of incentive type on performance will depend on how a particular incentive type and payoff timing combination is conceptualized by the employee and whether this conceptualization activates an information processing orientation that is appropriate for a particular task (Lieberman and Trope 1998; Trope and Liberman 2003; Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010). Construal Level Theory (CLT) suggests that individuals conceptualize future events either concretely or abstractly depending on the characteristics and timing of the event (Lieberman and Trope 1998; Trope and Liberman 2003). To the extent that a future event is concretely conceptualized (because it is characterized by specific details and is anticipated to occur in the near future), individuals will adopt a localized information processing orientation that is well suited to performing analytic tasks (Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010). To the extent that a future event is abstractly conceptualized (because it is characterized by general characteristics and is anticipated to occur in the distant future), individuals will adopt a global information processing orientation that is well suited to performing creative tasks (Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010).

This study draws on CLT to argue that the effect of incentive type on performance will depend on whether a particular incentive type and payoff timing combination is concretely or abstractly conceptualized and whether this conceptualization activates an information processing orientation that is well-suited for a particular task. When employees conceptualize an incentive payoff concretely, due to the detailed characteristics of the incentive and the immediacy of the payoff (e.g. cash incentive paid in near future), employees will process information in a

localized, piecemeal fashion. This localized processing orientation is well-suited for performing structured, analytic tasks such as parts assembly or matching vendors' invoices to purchase orders. When employees conceptualize an incentive abstractly, due to the general characteristics of the incentive and the deferral of the payoff (e.g. dream vacation redeemed in the distant future), employees will adopt a global, holistic information processing orientation. This global information processing orientation is well-suited for performing unstructured, creative tasks such as new product development.

Incentive type, payoff timing and task type are also important to practice because they are under the firm's control and have an impact on employee and firm performance (Holmstrom and Milgrom 1991; Kole 1997; Prendergast 1999; Kachelmeier et al. 2008; Oyer 2008; Kachelmeier and Williamson 2010; Backes-Gellner and Tuor 2010; Eaton and Rosen 2012). For example, firms manage incentive type by using non-cash incentives to reduce compensation costs (Oyer 2008) and to attract and retain specific types of employees (Backes-Gellner and Tuor 2010).¹ Firms manage payoff timing by deferring compensation in order to prevent employees from engaging in short-term manipulation of the incentive scheme and to improve retention of desirable employees (Prendergast 1999; Eaton and Rosen 2012). Firms manage task type by combining different tasks and task attributes into a single job in order to improve operating efficiency and incentive scheme effectiveness (Holmstrom and Milgrom 1991; Kachelmeier et al. 2008; Kachelmeier and Williamson 2010).

This study investigates how incentive type, incentive payoff timing and task type affect performance using a 2 x 2 x 2 between-group, within-subjects, mixed design. It manipulates incentive type between subjects by varying the type of performance bonus participants receive

¹ For example, only outdoor enthusiasts are likely to be attracted by REI, the outdoor equipment retailer, offering employees discounts on outdoor recreation equipment and free equipment rentals (<http://www.rei.com/jobs/pay.html>).

(cash or non-cash). The study manipulates incentive payoff timing between subjects by varying when the participants receive their performance bonus (near future or distant future). It manipulates task type within subjects by having participants perform both analytic and creative tasks. The primary dependent variable is task performance which measures each participant's overall performance on each task.

Consistent with these predictions, the effects of incentive type on performance depend on incentive payoff timing and task type. When performing an analytic task, the most effective combination of incentive type and payoff timing is cash paid in the near future. When performing a creative task, the most effective combinations of incentive type and payoff timing are cash paid in the near future and non-cash incentives paid in the distant future.

The study has important implications for practice because it identifies when non-cash incentives can be substituted for cash incentives without a reduction in employee performance. Specifically, results demonstrate that while cash paid in the near future is most effective for an analytic task, a non-cash incentive paid in the distant future is as effective as cash paid in the near future for a creative task. Knowing when non-cash incentives are as effective as cash is important because non-cash incentives are often less expensive to firms than their retail cash equivalents (Oyer 2008). Non-cash incentives are often less expensive because firms can purchase them at wholesale prices and award them to employees at retail prices.

This study also contributes to accounting research in several ways. First, it provides insights into the effects of non-cash incentives on performance which is important since this incentive type is used by up to 67 percent of firms but is not well understood by researchers (Incentive Federation 2011; Presslee et al. 2013). Second, it contributes to accounting research by showing how both economic preferences and information processing effects can affect

employee performance and incentive scheme effectiveness (Bonner et al. 2000; Bonner and Sprinkle 2002). By showing that the effect of incentive type on performance depends on payoff timing and task type, the study complements conventional economic theory, a set of arguments that implies that cash paid in the near future is the most effective combination regardless of task type (Samuelson 1937; Koopman 1960; Baker et al. 1988). Finally, the present study contributes to a growing body of research related to the effect of incentives on the performance of creative tasks, a topic that has been identified as being an important area for future accounting research (Bonner and Sprinkle 2002; Kachelmeier et al. 2008; Kachelmeier and Williamson 2010).

The remainder of the paper is organized as follows. Section II describes the theoretical background and develops the hypotheses. Section III describes the experimental design. Section IV presents the results of the experiment. Section V summarizes the study's main findings and implications.

II. BACKGROUND AND HYPOTHESES

2.1 Effects of Non-cash Incentives on Performance

Non-cash incentives are incentives, such as merchandise, travel awards and retail gift cards, that have monetary value but cannot be readily exchanged into an equivalent cash amount (Incentive Federation Inc. 2007; Long and Shields 2010; Presslee et al. 2013).² Although non-cash incentives are extensively used across industries and functional areas and have an estimated annual cost of \$46 billion, they are not well understood by accounting researchers (Incentive Federation Inc. 2007; Presslee et al. 2013). To address this gap in the accounting literature, this study investigates the effect of non-cash incentives on employee performance compared to an

² Some non-cash incentives are symbolic and have no monetary value such as employee recognition awards and plaques (Long and Shields 2010). In contrast, non-cash incentives are defined here as non-cash awards that have monetary value in order to be consistent with prior accounting studies (e.g., Presslee et al. 2013) and because it allows me to directly compare their performance effects with the performance effects of equivalently valued cash incentives.

economic benchmark of cash incentives. It is important to examine factors affecting the effectiveness of different incentive types because incentives can influence how employees use accounting information (see Bonner and Sprinkle 2002 for a review).

This study builds on Presslee et al. (2013) who find that employees awarded non-cash incentives have greater goal commitment than employees awarded cash incentives but set less challenging goals and perform at a lower level (Presslee et al. 2013). Employees awarded non-cash incentives have greater goal commitment because non-cash incentives have greater hedonic appeal than cash incentives (Jeffrey 2009). Employees awarded non-cash incentives set less challenging goals because they are more loss averse as a result of how they mentally account for each incentive type (Thaler 1999; Kahneman 2003; Presslee et al. 2013). Employees awarded non-cash incentives are more loss averse because prospective losses have a disproportionately large effect on non-cash incentive mental accounts, which are relatively smaller and used less frequently than cash incentive mental accounts (Presslee et al. 2013). Employees awarded non-cash incentives perform at a lower level because task performance and goal difficulty often have a positive relationship, i.e., setting less difficult goals results in lower performance (Locke and Latham 1990; Bonner and Sprinkle 2002).

This study extends Presslee et al. (2013) by using economic and psychology theories to predict the circumstances under which non-cash incentives can have similar performance effects as cash incentives despite differences in mental accounting. While conventional economic theory implies that cash incentives paid in the near future will be the most effective incentive type and payoff timing combination regardless of task type (Samuelson 1937; Koopman 1960; Baker et al. 1988), Construal Level Theory (CLT) suggests that the effect of incentives on performance will also depend on information processing effects unrelated to employees' economic preferences

(Liberman and Trope 1998; Trope and Liberman 2003; Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010).

2.2 Economic Effects of Incentive Type and Payoff Timing on Performance

Conventional economic theory suggests that a cash incentive paid in the near future is the most effective incentive type and payoff timing combination regardless of task type (Taylor 1914; Samuelson 1937; Koopman 1960; Ainslie 1975; Smith 1976; Baker et al. 1988; Frederick et al. 2002; Peterson and Luthans 2006; Long and Shields 2010). According to this viewpoint, cash incentives are more effective than non-cash incentives because cash is fungible and has greater value in exchange (Baker et al. 1988; Peterson and Luthans 2006). Cash incentives are thought to be more effective because employees derive utility from being able to independently choose how to spend their cash bonuses while they are constrained in how they spend their non-cash bonuses (Peterson and Luthans 2006). Finally, cash incentives are more effective than non-cash incentives because employees' utilities for monetary rewards are non-satiable and characterized by a "monotone increasing function of the monetary reward" (Smith 1976).³ That cash incentives can be effectively used by firms to motivate employees is evidenced by the long-standing practice of companies using monetary incentives to induce or reward desired employee behavior (Taylor 1914).⁴

Near future payoffs are more effective than distant future payoffs as individuals discount near future events less than distant future events and individuals have a psychological preference

³ Smith's postulate of non-satiation posits that when an individual is provided a choice between two alternative rewards, the individual will choose to receive the alternative that offers the higher monetary value. This postulate assumes that the cost of the two alternatives is identical.

⁴ Although monetary incentives can decrease task performance due to the incentives crowding out intrinsic interest (e.g. Fessler 2003), the evidence is inconclusive. For effort-sensitive, non-creative tasks, cash incentives often have a positive effect on task performance (Bonner and Sprinkle 2002). For creative tasks, where intrinsic interest is thought to have a more significant impact on performance, monetary incentives can still positively affect performance (Kachelmeier et al. 2008; Reeves and Read 2009). For example, Kachelmeier et al. (2008) show that piece rate monetary incentives can increase weighted creative productivity and Reeves and Read (2009) speculate that the use of monetary incentives may activate greater excitement and task engagement.

for immediate consumption over deferred consumption (Samuelson 1937; Koopman 1960; Ainslie 1975; Frederick et al. 2002). Individuals discount near future events less than distant future events because, *ceteris paribus*, events taking place in the near future are more likely to have a greater impact on the individual's immediate well-being than events taking place in the distant future.^{5,6} Individuals prefer immediate consumption over deferred consumption due to psychological preferences for immediacy that arise from 'visceral' factors related to impulsiveness, impatience and a desire for instant gratification (Ainslie 1975; Frederick et al. 2002).⁷

2.3 Conceptualizing Incentives and Effects of Payoff Timing

In this section, this study examines how cash and non-cash incentives can be concretely or abstractly conceptualized and how these conceptualizations are affected by incentive payoff timing. Examining how different incentive type and payoff timing combinations are conceptualized is useful because CLT suggests that concrete and abstract conceptualizations of future events affect how task-related information is processed (Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010).

⁵ The discounted utility model formalizes intertemporal discounting by transforming future well-being into a present value based on an individual's time preference, i.e., discount rate. Individuals' time preferences, as evidenced in their implicit discount rates, are not constant and often decline over time, i.e., hyperbolic discounting (Thaler 1981; Frederick et al. 2002). Variation in the discount rates over different time horizons indicates that individuals are more sensitive to differences in the time horizons of events taking place in the near future but are less sensitive to differences in the time horizons of events taking place in the distant future.

⁶ Discounted utility theory is particularly relevant to accounting settings because it provides the theoretical foundation for the time value of money calculations that are commonly found in accounting textbooks (e.g., Horngren et al. 2003).

⁷ There are instances when individuals may derive utility from postponing consumption (Loewenstein 1987; Nowlis et al. 2004). This occurs when the individual enjoys not only the experience of consumption but also the anticipation of consumption, i.e., anticipatory pleasure.

2.3.1 Construal Level Theory and Psychological Distance

CLT suggests that individuals conceptualize future events either concretely or abstractly depending on the perceived psychological distance between the individual and the event (Liberman and Trope 1998; Trope and Liberman 2003; Trope and Liberman 2010). When future events are perceived as being psychologically near, they are conceptualized concretely in terms of localized details and practicality. When future events are perceived as being psychologically distant, they are conceptualized abstractly in terms of general characteristics and ideals. For example, when reading the *Wall Street Journal* is perceived as being psychologically near, the act of reading is concretely conceptualized as turning pages and visually scanning rows of letters. Alternatively, when reading the *Wall Street Journal* is perceived as being psychologically distant, the act of reading is abstractly conceptualized as obtaining valuable, but “far off” business information, information that can be used, for example, to improve future business decisions and enhance career prospects.

Although perceived psychological distance is affected by a range of factors, temporal distance has been identified as being particularly important (Liberman and Trope 1998; Trope and Liberman 2003; Trope et al. 2007). Events taking place in the near future are perceived as being psychologically near and are concretely conceptualized in terms of specific details and immediate practicality. Events taking place in the distant future are perceived as being psychologically distant and are abstractly conceptualized in terms of general characteristics and overall desirability (Liberman and Trope 1998; Trope and Liberman 2003). For example, when a manager perceives attending an out-of-town meeting as being psychologically near in that the meeting will be held the next day, most managers will concretely conceptualize the meeting in terms of specific details such as the departure time of the airplane and the address of the meeting

location. In contrast, when a manager perceives attending an out-of-town meeting as being psychologically distant, as, for instance, a meeting that will be held in three months, most managers conceptualize the meeting abstractly in terms of general attributes such as whether attending the meeting is strategically beneficial.

2.3.2 Conceptualizing Incentives

This study applies CLT to a setting where incentives are either cash or non-cash. Cash and non-cash incentives can be situated along a concrete-abstract continuum depending on their perceived psychological distance. Cash incentives are psychologically near and concretely conceptualized because cash is the most frequently used method of payment in point-of-sale retail transactions and is the most practical, immediately useful form of compensation (Baker et al. 1988; Arango et al. 2011). In contrast, non-cash incentives are psychologically distant and abstractly conceptualized because non-cash incentives, such as vacations to exotic destinations, are often luxuries that employees do not routinely experience (Jeffrey 2009). Non-cash incentives are also more psychologically distant because they often have no immediate practical use and are frequently incorporated into abstract retail reward point programs (Alonzo 1996; Presslee et al. 2013).

Although the current study draws on CLT to situate cash and non-cash incentives on a concrete-abstract continuum depending on their psychological distance, it differs from prior CLT research. No other CLT study has examined how different incentives are conceptualized and whether the effect of incentives on behavior is consistent with CLT predictions. Moreover, in this study CLT is being applied to a setting that involves actual economic incentives and this is advantageous because behavior predicted by psychological theories may not generalize well to settings where economic incentives are provided (Grether and Plott 1979; Smith 1991).

While CLT suggests that individuals' conceptualizations of future events, such as receiving an incentive bonus, can be affected by the characteristics of the event itself, these conceptualizations are also affected by the timing of the event (Liberman and Trope 1998; Trope and Liberman 2003). In the next section, I examine how employees' conceptualizations of different incentive types are affected by incentive payoff timing.

2.3.3 Effects of Incentive Payoff Timing on How Incentives Are Conceptualized

This research applies CLT to a setting where incentives are paid in either the near or distant future. The effects of incentive payoff timing on how employees conceptualize incentives are examined as CLT suggests that temporal distance affects perceived psychological distance. When firms pay incentives in the near future, employees are likely to conceptualize the incentives more concretely and in greater detail because the payment is psychologically near. By way of contrast, when firms pay incentives in the distant future, employees are more likely to conceptualize the incentives more abstractly and in more general terms because the payment is psychologically distant. This distinction between near and distant future payoffs is particularly relevant to accounting research because although different payoff timings can have different performance effects, most incentive studies only examine incentive schemes with near future payoffs (i.e., less than a month) (Bonner and Sprinkle 2002; Condly et al. 2003).⁸

Although this study draws on CLT to analyze how incentive payoff timing can affect how employees conceptualize different incentive types, it differs from prior CLT research that

⁸ Employee perceptions of incentives can also be affected by incentive payoff timing due to the effects of anticipatory pleasure which is described above (Loewenstein 1987; Nowlis et al. 2004). Employee perceptions of incentives can also be affected by incentive payoff timing due to cognitive processing effects (Loewenstein 1987; Kida and Smith 1995; Nowlis et al. 2004; Mercer 2005). Incentive payoff timing can affect how employees process incentive-related information because individuals tend to rely more on cognitive-based judgments for shorter time horizons and affect-based judgments for longer time horizons (Kida and Smith 1995; Mercer 2005). The effects of incentive payoff timing on how incentives are perceived are examined in greater detail in the Supplementary Analysis section.

examines the effects of time. While most CLT studies take place in settings involving imaginary future events (e.g. Trope and Liberman 1998; Liberman et al. 2002), this study takes place in a setting involving a real future event, i.e., an incentive bonus payoff. It is helpful to use a realistic future event when studying the effects of time because individuals often respond differently to realistic vs. hypothetical events, particularly when financial incentives are involved (Smith 1991; Coller and Williams 1999; Brosig et al. 2003; Nowlis et al. 2004).

In the previous two sections, incentive type and payoff timing are described with respect to their independent effects on how employees conceptualize incentives. In the next section, incentive type and payoff timing are described with respect to their joint effect on how employees conceptualize incentives due to (mis)matching of psychological distances.

2.3.4 Matching of Incentive Type and Payoff Timing

Because incentive payoff timing can affect the extent to which an incentive is concretely or abstractly conceptualized, it is important to identify the joint effects of different incentive type and payoff timing combinations. When the psychological distance of the incentive type “matches” the psychological distance of the incentive payoff timing, employees are likely to conceptualize the combination either concretely or abstractly. For example, when a cash incentive is matched with a near future payoff, employees concretely conceptualize the combination because cash incentives and near future payoffs are both psychologically near. When a non-cash incentive is matched with a distant future payoff, employees abstractly conceptualize the combination because non-cash incentives and distant future payoffs are both psychologically distant. In contrast, employees are likely to conceptualize an incentive type and payoff timing combination more neutrally when there is a “mismatch” between incentive type and payoff timing due to the offsetting effects of psychological distance. These offsetting effects

occur when a cash incentive is mismatched with a distant future payoff and non-cash incentives are mismatched with a near future payoff.

Having described the joint effects of different incentive type and payoff timing combinations, I next predict how these combinations affect task performance. Because different incentive type and payoff timing combinations activate different information processing orientations and because some information processing orientations are better suited for some tasks than for others, I predict that the joint effect of incentive type and payoff timing on task performance depends on task type.

2.4 Effects of Incentive Type, Payoff Timing, and Task Type on Performance

This section examines how different incentive type and payoff timing combinations affect task performance by influencing how employees process task-related information. Investigating the effects of different incentive type and payoff timing combinations on task performance is a contribution because some combinations improve performance of some tasks while impairing performance of other tasks.

2.4.1 Information Processing and Task Type

CLT research indicates that the characteristics and timing of a future event can affect how an individual conceptualizes the event, which, in turn, affects whether a local or global information processing orientation is adopted (Forster et al. 2004; Trope et al. 2007). When an event is concretely conceptualized because of its detailed, practical characteristics and near future timing, individuals process information in a localized, piecemeal fashion (Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010). When an event is abstractly conceptualized because of its general characteristics and distant future timing, individuals process information in a global, holistic fashion (Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010).

The effects of local and global information processing on task performance depend on what type of task is being performed (Schooler et al. 2002; Forster 2004). A local information processing orientation can improve performance of tasks that require detailed analysis and following step-by-step procedures. A global information processing orientation can improve performance of tasks that require insight and creativity.

Distinguishing between different types of tasks impacts accounting research in that prior studies have shown that incentive scheme effectiveness can vary depending on whether the task is a highly-structured, analytic task or a loosely-structured, creative task (Bonner and Sprinkle 2002; Kachelmeier et al. 2008; Kachelmeier and Williamson 2010). While incentives can positively affect performance of effort-sensitive analytic tasks, incentives can negatively affect performance of creative tasks by “crowding out” intrinsic task interest (Deci et al. 1999; Bonner and Sprinkle 2002; Fessler 2003; Kachelmeier et al. 2008). Firms benefit from distinguishing between analytic and creative tasks because firms frequently combine different task types and task attributes into a single job which can enhance or diminish the overall effectiveness of the incentive scheme (Holmstrom and Milgrom 1991).

2.4.2 Effects of Incentive Type and Payoff Timing on Analytic and Creative Task Performance

The thesis experimental setting includes different incentive type and payoff timing combinations. These combinations can be conceptualized concretely or abstractly. When the combination is concretely conceptualized (because a cash incentive is matched with a near future payoff), employees are more likely to adopt a localized information processing orientation characterized by attention to details, practicality and feasibility. When the combination is abstractly conceptualized (because a non-cash incentive is matched with a distant future payoff), employees are inclined to adopt a globalized information processing orientation characterized by

attention to generalities and overall desirability. When cash incentives are mismatched with distant future payoffs or non-cash incentives are mismatched with near future payoffs, information processing is likely to be impeded or disrupted because of offsetting effects.

When performing an analytic task, the most effective incentive type and payoff timing combination should be cash that is paid in the near future. This prediction is consistent with conventional economic and psychological theories. It is consistent with economic theory where cash is frequently viewed as being the most practical, immediately useful form of compensation and individuals generally prefer immediate consumption over deferred consumption (Samuelson 1937; Koopman 1960; Baker et al. 1988; Frederick et al. 2002). It is consistent with construal and information processing theories because the matching of cash incentives with a near future payoff can activate a concrete information processing orientation that is well-suited to performing detail-oriented, analytic tasks (Lieberman and Trope 1998; Schooler et al. 2002; Trope and Liberman 2003; Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010; Trope and Liberman 2010). This line of argumentation leads to the following hypothesis:

H1: For analytic tasks, a cash incentive with a near future payoff is the most effective combination of incentive type and payoff timing.

When performing a creative task, the most effective incentive type and payoff timing combinations should be a cash incentive that is paid in the near future *and* a non-cash incentive that is paid in the distant future. This prediction is consistent with there being separate economic and information processing effects. It is consistent with economic theory, as described above, in that cash is the most practical, immediately useful form of compensation and individuals generally prefer immediate consumption over deferred consumption (Samuelson 1937; Koopman 1960; Baker et al. 1988; Frederick et al. 2002). This prediction is also consistent with psychological theory where the matching of a non-cash incentive with a distant future payoff can

activate an abstract information processing orientation that is well-suited to performing creative tasks (Liberman and Trope 1998; Schooler et al. 2002; Trope and Liberman 2003; Forster et al. 2004; Trope et al. 2007; Malkoc et al. 2010; Trope and Liberman 2010). Given this line of thinking, I posit:

H2: For creative tasks, a cash incentive with a near future payoff and a non-cash incentive with a distant future payoff are the most effective combinations of incentive type and payoff timing.

Finally, the research question of whether a cash incentive with a near future payoff or a non-cash incentive with a distant future payoff is the most effective incentive type and payoff timing combination for a creative task can be posed. Economic and psychological theories make different predictions about employee performance. Economic theory predicts that cash incentives paid in the near future will be most effective due to the economic preferences of the employees. CLT predicts that non-cash incentives paid in the distant future will be most effective since the matching of a non-cash incentive with a distant future payoff activates a global information processing orientation that is well-suited to performing creative tasks. Therefore, the following contingent research question can be articulated:

RQ1: For creative tasks, will a cash incentive with a near-future payoff or a non-cash incentive with a distant future payoff be more effective?

III. METHOD

3.1 Experimental Design and Task Description

A laboratory experiment has been selected as the most appropriate method for examining the contravening effects of incentives, payoff timing perceptions, and task type. It employs a 2 x 2 x 2 between-group, within-subjects, mixed design in which incentive type, incentive payoff timing, and task type are each manipulated at two levels. The first independent variable, incentive type, is manipulated between subjects at the cash or non-cash levels. The second

independent variable, incentive payoff timing, is manipulated between subjects at the near future or distant future levels. The third independent variable, task type, is manipulated, within subjects, at the two levels of analytic or creative task type. Participants perform each task for five rounds after completing one practice round per task. The unit of analysis was total performance for each task over five rounds.

There are two dependent variables, depending on the task type, “problems solved-analytic” and “problems solved-creative.” For each task, problems-solved is measured as the total number of problems solved across all five performance rounds.

3.2 Experimental Procedures

Participants perform two tasks at their individual computer terminal as described in the experiment timeline shown in Figure 1.⁹ The tasks consist of alpha-numeric decoding problems and creative word association problems. The order of the tasks is randomized to control for order effects.

Insert Figure 1 here

After receiving instructions and taking a comprehension check quiz, participants began the first task. Participants started the task by performing a two and a half minute practice round that consisted of four practice problems. Upon completing the practice round, participants responded to questions related to their perceptions of the task. Participants were then provided information describing their performance bonuses and were required to correctly answer all questions on the performance bonus quiz before proceeding.

Once participants successfully passed the performance bonus quiz, they completed five, three-minute performance rounds with each round consisting of nine problems. Participants received performance feedback after completing each round. Feedback consisted of the bonus

⁹ The experiment was programmed using z-Tree software (Fischbacher 2007).

amount earned that period. For every problem correctly solved, participants earned either \$1 or 1 Lifestyle Rewards point depending on their incentive type condition. Upon completing the first task, the participants answered additional questions related to their perceptions of the task. These instrument items, along with the practice round questions, are asked in order to assess whether incentive type and payoff timing crowd out participants' intrinsic task interest (e.g., Fessler 2003).

Following the completion of the first task, participants were given a distractor task that consisted of providing demographic information. The distractor task helps to avoid cognitive processing effects activated during the first task from spilling over and affecting performance during the second task. Participants then completed the second task, which was organized identically to the first task. After completing the second task, they filled out a post-experimental questionnaire, received a \$5 show-up fee and were given a receipt for their performance bonus.

In order to collect their performance bonuses, all participants had to return for a second session. The date of the second session was determined by participants' incentive payoff timing condition, i.e., one day or six weeks following the first session. During the second session, participants completed a second post-experimental questionnaire, received another \$5 show-up fee and were paid the bonus that they earned during the first session. The average performance bonus earned by each participant was approximately \$25.

3.3 Incentive Type

Incentive type was manipulated between subjects at two levels as shown in Appendix A: cash or non-cash. In the cash incentive condition, participants were informed that they could earn a cash bonus based on their performance. The cash incentive manipulation contained a written description of the cash incentive as well as three images of cash. Images of cash were included in the manipulation in order to make the incentive more salient and to maintain consistency with the non-cash incentive condition which contains images of three retail store logos.

In the non-cash incentive condition, participants earned Lifestyle Rewards points based on their performance. The non-cash incentive manipulation contained a written description of the non-cash incentives as well as images of the logos of the three retailers included in the Lifestyle Rewards program. Images of the non-cash incentives were included in the manipulation in order to make the incentives more salient and to maintain consistency with the cash incentive condition.

Participants in the non-cash incentive condition converted Lifestyle Reward points, which were earned during the experiment, into retail gift cards that could be used at AMC Theaters, Cheesecake Factory and Dick's Sporting Goods. These three retailers were selected for the Lifestyle Rewards program because pretesting indicated that college-age students find these retailers attractive and are associated with entertainment and recreation. The Lifestyle Rewards program was more abstract than cash because the retailers used in the program provided goods and service that are non-essential luxuries that students typically do not use every day. Similarly, the Lifestyle Rewards program was more abstract than cash since the incentive scheme itself consists of an abstract point system that requires the conversion of Lifestyle Rewards points into a retail dollar amount.

3.4 Payoff Timing

Payoff timing was manipulated between subjects at two levels: near future or distant future. In the near-future payoff condition, participants received their bonus payments one day following the experiment. In the distant-future payoff condition, participants received their bonus payments six weeks following the experiment. Participants in both conditions were required to return to the same bonus distribution location to collect their bonuses in order to ensure that participants across conditions exerted the same level of effort. This design feature rules out the possibility that differences in the anticipated effort required to collect future bonus payments affects performance. The one day and six week payoff delays effectively operationalized the near and distant future time constructs as evidenced by pre-test results where individuals consistently viewed one day as being closer in time than six weeks ($t = 3.28$; $p < 0.01$; *two-tailed*).

3.5 Task Type

Task type was manipulated within subjects at two levels as shown in Appendix B: analytic and creative. In the analytic task condition, participants performed alpha-numeric decoding consisting of 10 numbers per problem that need to be decoded into letters. The alpha-numeric decoding task is frequently used in accounting studies as an effort-sensitive task (Chow 1983; Church et al. 2008). Different decoding keys are used each round to avoid possible performance effects associated with participants memorizing the decoding key. Alpha-numeric decoding effectively operationalized the analytic task construct because it involved highly detailed information processing whereby the correct solution can be arrived at using a direct, algorithmic problem solving approach (see Ashton 1990 for discussion of task characteristics).

In the creative task condition, participants solved Remote Associate Test problems which are creative word problems that require participants to provide a word that links three seemingly

unrelated words (Mednick 1962, Bowden and Jung-Beeman 2003). For example, the three words “Cottage-Swiss-Cake” are related by the word “Cheese.” The Remote Associate Test problems effectively operationalized the creative task construct because it involved highly abstract information processing whereby the correct solution could only be obtained using an indirect, heuristic problem solving approach. Remote Associate Test problems are frequently used as measures of individual creativity (Bowden and Jung-Beeman 2003).

3.6 Participants

Eight computerized sessions were held in an experimental economics laboratory at a large university in the Southeast United States. Fourteen participants participated in each session for a total of 112 participants (8 X 14). The eight sessions were combined to create the four between-group conditions with 28 participants per condition: cash/near-future; cash/distant-future; non-cash/near-future and non-cash/distant future. The participants, who were undergraduate, native English speakers, were randomly selected from an online experimental economics data base.¹⁰ Participants were randomly selected in order to obtain a representative sample of the undergraduate student population. Each participant was randomly assigned to one of the four between-group conditions. Participants were randomly assigned in order to ensure that the attributes of the participants across all four conditions were similar. Four participants were withdrawn from the total sample because they indicated on the post-experiment questionnaire that they were not native English speakers. An additional participant was withdrawn from the total sample because he did not complete the study.¹¹ The average age of the participants was 20.6 years and is not significantly different across conditions ($p = 0.86$). About 54 percent of the participants were female and there were no significant gender differences

¹⁰ Participants were required to be native English language speakers because the Creative Task (Remote Associate Test word problems) requires English language fluency.

¹¹ The results are inferentially identical if these five participants are included in the sample.

across conditions ($p = 0.79$).¹² Because there were no age and gender differences across conditions, these demographic factors were not included in subsequent analysis.

IV. RESULTS

4.1 Validation of Operational Variables

Before analyzing the results of the experiment, the research instrument was validated. First is validation of the incentive type manipulation. Because psychology theory indicates that conceptual concreteness is associated with increased concerns for feasibility and practicality (Liberman and Trope 1998; Trope and Liberman 2003), a three-item “concreteness” factor was created consisting of how practical, useful and functional participants perceived their incentive to be using 7-point semantic differential scales (Eigen Value = 2.47; variance explained = 82.4%). The scales ranged from 1 (Not practical/useful/functional) to 4 (moderately practical/useful/functional) to 7 (very practical/useful/functional).¹³ By regressing this factor onto incentive type, I found that participants provided with cash incentives perceived their incentive type to be significantly more concrete than those who received the non-cash incentives ($t = 6.06$; $p < 0.01$, *two-tailed*). This result is consistent with cash incentives being conceptualized more concretely than non-cash incentives.

Second was validation of the payoff timing manipulation. Psychological theory indicates that near future events are conceptualized more concretely than distant future events (Trope and Liberman 2003). To validate that participants perceived payments that are received the following day as being closer in time than payments received six weeks later, a 7-point semantic differential scale was used. It ranged from 1 (not near future) to 4 (moderately near future) to 7 (very near future). Results indicate that participants in the near future payoff condition perceived

¹² Since this was a random assignment experiment, the likelihood of gender or any other common differences across subjects is greatly reduced by the design itself.

¹³ A semantic differential scale, which uses intervals, allows parametric statistics to be used for data analysis.

their payoffs as being significantly closer in time than participants in the distant future payoff condition (5.72 vs. 3.07; $t = 8.58$; $p < 0.01$, *two-tailed*).

Third was validation of the task type manipulation. To validate that participants perceived the decoding task as an analytic task and the Remote Associate word task as a creative task, participants were asked to record the extent to which they believed each task required imagination using a 7-point semantic differential scale. The scale ranged from 1 (no imagination) to 4 (moderate imagination) to 7 (a lot of imagination). Results indicate that the Remote Associate Test problems were perceived as requiring significantly more imagination than the decoding problems (5.79 vs. 1.97; $t = 18.59$; $p < 0.01$, *two-tailed*). This result is consistent with the Remote Associate Test problems being commonly used as a measure of creativity (Mednick 1962, Bowden and Jung-Beeman 2003).

4.2 Measures and Descriptive Statistics

Tables 1 and 2 report the descriptive statistics for the dependent variables used to test H1, H2 and RQ1. As reported in Table 1 and graphed in Figure 2, analytic task performance is directionally higher when cash incentives were paid in the near future compared to other incentive type and payoff timing combinations (cash/near future mean = 25.48 > other combinations). This pattern in the dependent variable is consistent with H1.

Insert Figure 2 here

Insert Table 1 here

As reported in Table 2 and graphed in Figure 3, creative task performance is directionally higher when cash incentives are paid in the near future and when non-cash incentives are paid in the distant future (cash/near future mean = 27.48 and non-cash/distant future mean = 27.78 > other combinations). This pattern in the dependent variable is consistent with H2.

Insert Figure 3 here

Insert Table 2 here

My research question evaluates whether cash incentives paid in the near future or non-cash incentives paid in the distant future are associated with higher levels of creative task performance. As reported in Table 2 and graphed in Figure 3, creative task performance is similar regardless of whether cash incentives are paid in the near future or non-cash incentives are paid in the distant future (27.48 vs. 27.78).

4.3 Tests of Hypotheses and Research Question

H1 predicts that, when performing an analytic task, a cash incentive paid in the near future will be the most effective incentive type and payoff timing combination.¹⁴ To test the effectiveness of this incentive type and payoff timing combination relative to other combinations, planned contrasts (Buckless and Ravenscoft 1990) can be utilized. Specifically, one assigns +3 to cash/near future, -1 to cash/distant future, -1 to non-cash/near future, and -1 to non-cash/distant future. The dependent variable is problems solved-analytic.

As reported in Table 3-Panel A, H1 is supported ($t = 2.10$, $p = 0.02$, *one-tailed*).¹⁵ These results suggest that when firms provide incentives to employees performing analytic tasks, the most effective combination of incentive type and payoff timing is cash paid in the near future.

Insert Table 3 here

H2 predicts that, when performing a creative task, a cash incentive paid in the near future and a non-cash incentive paid in the distant future will be the most effective incentive type and payoff timing combinations. To evaluate the effectiveness of these incentive type and payoff

¹⁴ Task order was tested and found to have an insignificant effect on performance ($p > 0.32$, *two-tailed*). Because task order does not have an effect on performance, task order is not included in the analysis.

¹⁵ The results are inferentially identical when the cash/near-future condition is individually compared to the other conditions.

timing combinations relative to other combinations, planned contrasts were used again. Specifically, one assigns +2 to cash/near future, -2 to cash/distant future, -2 to non-cash/near future, and +2 to non-cash/distant future. The dependent variable is problems solved-creative.¹⁶

As reported in Table 3-Panel B, H2 is supported ($t = 2.19$, $p = 0.02$, *one-tailed*).¹⁷ These results suggest that when firms provide incentives to employees performing creative tasks, the most effective combinations of incentive type and payoff timing are cash incentives paid in the near future and non-cash incentives paid in the distant future.

Finally, RQ1 investigates when performing a creative task, whether a cash incentive paid in the near future or non-cash incentive paid in the distant future will be the most effective incentive type and payoff timing combination. To evaluate the relative effectiveness of each combination, their mean performance scores were compared using a t-test. The dependent variable is problems solved-creative.

As reported in Table 3-Panel C, a non-cash incentive paid in the distant future is equally effective as a cash incentive paid in the near future (27.78 vs. 27.48) ($t = 0.16$, $p = 0.87$, *two-tailed*). These results suggest that when firms provide incentives to employees performing creative tasks, either cash incentives paid in the near future or non-cash incentives paid in the distant future are equally effective. However, to the extent that firms can provide non-cash incentives at a lower cost than cash incentives, firms can benefit from substituting non-cash incentives for cash.

¹⁶ The planned contrast model used to test H2 is identical to conventional ANOVA which assigns equal weights to each condition. Planned contrasts are used to test H2 in order to be consistent with the testing of H1.

¹⁷ The results are inferentially identical when the cash incentive-near future and non-cash incentive-distant future conditions are separately compared to the other conditions.

4.4 Supplemental Analysis

In order to provide further evidence that the pattern of results is consistent with the theory used in this thesis, questionnaire data collected during both the first and second sessions was analyzed. This questionnaire data was used to assess whether participants' perceptions of incentive type and payoff timing predict the pattern of results found in the two dependent variables. Questionnaire data was also used to rule out the alternative explanation that the pattern of results was due to cash and non-cash incentives differentially crowding out participants' intrinsic interest in the tasks. Finally, questionnaire data was used to highlight how cash incentives paid in the near future and non-cash incentives paid in the distant future are both positively perceived but in different ways and with different behavioral effects.

4.4.1 Perceptions of Incentive Type and Payoff Timing as Predictors of Performance

Did participants' self-reported perceptions of incentive type and payoff timing predict the pattern of the results found in the two dependent variables? Participants' perceptions of incentive type concreteness and temporal distance, which are described above, were dichotomized based on whether they reflect a concrete or abstract orientation. These two dichotomous variables were then matched to reflect the main theoretical constructs used in the study: concrete incentive-concrete payoff timing; concrete incentive-abstract payoff timing; abstract incentive-concrete payoff timing and abstract incentive-abstract payoff timing.

These matched pairs of self-reported questionnaire data were next used to predict task performance based on the same planned contrasts that tested H1 and H2. Consistent with the planned contrasts used to test H1, concrete incentive-concrete payoff timing was assigned +3 while concrete incentive-abstract payoff timing, abstract incentive-concrete payoff timing and abstract incentive-abstract payoff timing were each assigned -1. Consistent with the planned

contrasts used to test H2, concrete incentive-concrete payoff timing was assigned +2, concrete incentive-abstract payoff timing was assigned -2, abstract incentive-concrete payoff timing was assigned -2 and abstract incentive-abstract payoff timing is assigned +2.

The results of the planned contrasts are consistent with the theories used to motivate H1 and H2. Consistent with H1, participants who perceived their incentive type and payoff timing most concretely demonstrated significantly higher analytic task performance ($t = 1.97$; $p = 0.03$, *one-tailed*). These participants were also significantly more likely to be in the cash/near-future condition ($p < 0.01$, *one-tailed*). Consistent with H2, participants who perceived their incentive type and payoff timing most concretely or most abstractly had the highest level of creative task performance while controlling for intrinsic task interestingness ($t = 1.46$; $p = 0.07$, *one-tailed*). Participants in these two groups were also significantly more likely to be in either the cash/near-future or non-cash/distant future conditions ($p < 0.01$, *one-tailed*). These results support the theories used to develop the hypotheses because the results indicate that task performance is predicted by whether incentive type and payoff timing are concretely or abstractly conceptualized.

4.4.2 Intrinsic Task Interest

In order to rule out the possibility that the pattern of results is due to the incentives differentially crowding out intrinsic task interest, questionnaire data was employed to examine whether intrinsic task interest varies by incentive type. Intrinsic task interest was selected because prior research has shown that extrinsic, performance contingent rewards, such as piece rate incentives, can decrease intrinsic motivation without providing an offsetting increase in extrinsic motivation (Deci et al. 1999; Fessler 2003). Because the decrease in intrinsic

motivation may not be offset by an equivalent increase in extrinsic motivation, task performance can be negatively affected.

Participant perceptions of task interestingness was measured at the beginning and end of the analytic and creative tasks using a seven-point semantic differential scale that ranges from 1 (not interesting) to 4 (moderately interesting) to 7 (very interesting). Task interestingness was measured at the beginning and end of each task to control for the effects of performance feedback biasing participant perceptions of task interestingness. As reported in Table 4, results indicate that beginning and ending task interestingness does not vary by incentive type (all p 's > 0.40, *two-tailed*). Results also indicate that the change in task interestingness does not vary by incentive type (all p 's > 0.50, *two-tailed*). These results rule out the alternative explanation that the observed differences in task performance are due to the incentives differentially crowding out participants' intrinsic interest in the task.

Insert Table 4 here

4.4.3 Variation in Positive Perceptions

In this section, I explore how cash incentives paid in the near future and non-cash incentives paid in the distant future can both be perceived positively but in different ways and with different behavioral effects. The circumstances where cash incentives paid in the near future are perceived more positively are first examined with respect to participants' anticipated enjoyment, choice preferences, and bonus collection rates. Participants' anticipated enjoyment, which measures how enjoyable participants think it will be to use their bonuses, was measured at the end of the first session using a seven-point semantic differential scale that ranges from 1 (not enjoyable) to 4 (moderately enjoyable) to 7 (very enjoyable). Consistent with conventional economic theory, first session questionnaire responses indicate that participants in the cash/ near-

future condition anticipated enjoying their performance bonuses more than participants in the non-cash/distant-future condition (6.04 vs. 5.15; $t = 1.97$, $p = 0.05$, *two-tailed*).¹⁸

Participant incentive type and payoff timing choice preferences were also measured. Participants were asked, at the end of the second session, to make a hypothetical choice between a cash or non-cash incentive bonus and a one day or six week payoff delay. Participants were asked to make this hypothetical choice at the end of the second session in order to prevent the questions from biasing participants' responses to other questions. Results indicate that all participants preferred cash over non-cash incentives regardless of condition (48 vs. 0).¹⁹ Most participants also preferred to be paid after a one day delay as opposed to a six week delay regardless of condition (47 vs. 1; $\text{chi-square} = 44.10$; $p < 0.01$; *two-tailed*). These results are consistent with conventional economic theory that suggests that employees will prefer cash paid in the near future.

Participant incentive type and payoff timing preferences were also measured in the second session by counting the number of participants that actually showed up to collect their incentives bonuses. It is important to examine participants' actual behavior because individuals may respond differently to hypothetical vs. real choices (Smith 1991). Consistent with the questionnaire data reported above, more participants in the cash/near-future condition collected their bonuses than those in the non-cash/distant-future condition (96% vs. 82%; $\text{chi-square} = 3.00$, $p = 0.08$, *two-tailed*) although this effect was not significant at the .05 alpha protection level.

¹⁸ In order to ensure comparability between the first and second sessions, the results reported in Table 5 only contain the responses of those participants who attended both the first and second sessions ($N = 97$). The first session results for anticipated enjoyment using this reduced sample are inferentially identical to the results reported above which are based on the entire sample ($N = 107$).

¹⁹ A chi-square test cannot be used to test incentive type choice preferences because participants' preferences for cash were constant across both conditions.

What were the circumstances under which, if any, non-cash incentives paid in the distant future were positively perceived? These circumstances can be identified based on psychological theories related to anticipatory pleasure and affective information processing (Loewenstein 1987; Kida and Smith 1995; Nowliss et al. 2004; Mercer 2005). Theories related to anticipatory pleasure suggest that delayed consumption of desirable goods and services, such as non-cash incentives, is likely to increase pleasure because individuals can derive utility from both consumption and the anticipation of consumption (Loewenstein 1987; Nowliss et al. 2004). Theories related to affective information processing suggest that as time passes, individuals will adopt an information processing style that increasingly relies on affective-based reasoning as opposed to cognitive-based reasoning (Kida and Smith 1995; Mercer 2005). This shift towards affective information processing is likely to make non-cash incentives appear to be more desirable over time because non-cash incentives are frequently chosen by firms based on their hedonic appeal (Jeffrey 2009).

Consistent with theories of anticipatory pleasure and affective information processing, data collected during the second session indicates that non-cash incentives become increasingly attractive over time compared to cash incentives. Although participants in the non-cash/distant-future condition report significantly lower levels of anticipated enjoyment at the end of the first session, as reported in Table 5, there is no difference in anticipated enjoyment between conditions in the second session (cash/near future: 5.81 vs. non-cash/distant future 6.18; $t = 1.07$, $p = 0.29$, *two-tailed*). That those in the non-cash/distant-future condition feel increasingly positive about their incentive bonus over time is reflected in the changes in anticipated enjoyment between the first and second sessions. While anticipated enjoyment for participants in

the cash/near-future condition decreased between sessions, it increased for participants in the non-cash/distant-future condition (-0.19 vs. 0.96; $t = 2.60$, $p = 0.02$, *two-tailed*).

Insert Table 5 here

Participants' positive responses to non-cash incentives paid in the distant future are also evidenced by how frequently they anticipate thinking about their bonus. Frequency of thought, which has been used in prior accounting studies as a measure of hedonic appeal, was measured during the second session using a question that asks participants to estimate how frequently they will think about using their incentive bonus on a seven-point semantic differential scale 1 (not frequently) to 4 (moderately frequently) to 7 (very frequently) (Presslee et al. 2013). The results indicate that participants in the cash/near-future condition report that they will think about their bonuses less frequently than participants in the non-cash/distant-future condition (4.23 vs. 5.45; $t = 2.51$, $p = 0.02$, *two-tailed*).

Participants' positive responses to incentives in the non-cash/distant-future condition have important implications for employee satisfaction and word-of-mouth employee recruiting (Tansuhaj et al. 1988). When employees feel positively about their company and speak highly of their company to outsiders, potential job candidates outside the company are more likely to have a favorable impression of the company and a desire to seek employment at the company (Cable et al. 2000). Companies prefer to hire external job candidates, who are referred through this type of word-of-mouth recruiting, because it is more efficient than sifting "through a pile of strangers' resumes" (Weber and Kwoh 2013).

In order to examine whether participants in the non-cash/distant-future condition spoke more frequently to others about their bonuses than those in the cash/near-future condition, participants were asked in the second session to report the frequency with which they discussed

their bonus with others. Discussion frequency was measured during the second session using a seven-point semantic differential scale that ranged from 1 (not frequently) to 4 (moderately frequently) to 7 (very frequently). Consistent with employees speaking positively to others about their company, participants in the non-cash/distant-future condition discussed their incentive bonuses more frequently with others than those in the cash/near-future condition (2.58 vs. 3.86; $t = 2.25$; $p = 0.03$, *two-tailed*).²⁰

V. CONCLUSION

This study provides evidence that the effects of incentive type on performance depends on incentive payoff timing and task type. For an analytic task, I predicted and found evidence that a cash incentive paid in the near future is the most effective incentive type and payoff timing combination. This result is consistent with economic preferences and information processing having mutually reinforcing effects on employee performance. For a creative task, I predicted and found evidence that a cash incentive paid in the near future and a non-cash incentive paid in the distant future are the most effective incentive type and payoff timing combinations. This result is consistent with the independent effects of economic preferences and information processing on employee performance.

The results of this study have important implications for firms because they can help firms identify when non-cash incentives can be substituted for cash incentives without a reduction in performance. It is useful for firms to know when non-cash incentives can be substituted for cash since non-cash incentives are often less expensive than their retail cash

²⁰ Additional analysis, using the entire second session sample across all conditions ($N = 97$), indicates that participants in the cash incentive condition discussed their incentive bonus less frequently than those in the non-cash incentive condition (2.90 vs. 3.64; $t=1.77$, $p=.08$, *two-tailed*). This result suggests that the difference in discussion frequency between those in the cash/near-future condition and non-cash/distant future condition is not simply due to differences in incentive payoff timing, i.e., those paid in the near future simply had less time to discuss their bonus with others.

equivalents (Oyer 2008) and because non-cash incentives can attract and retain desirable employees (Prendergast 1999; Backes-Gellner and Tuor 2010). The results of this study indicate that non-cash incentives can be effectively substituted for cash incentives when the payoff is in the distant future and when the employees are performing creative tasks (H2, RQ1). Moreover, the results indicate (Supplemental Analysis) that firms may also benefit from the tendency of employees receiving this type of bonus payment to discuss their bonuses more frequently with others. This behavior has been identified as an important factor in word-of-mouth employee recruiting (Tansuhaj et al. 1988; Cable et al. 2000; Weber and Kwoh 2013).

The results of the study also contribute to accounting research. It provides insight into the effects of non-cash incentives on performance (H1, H2, RQ1) which is important because this incentive type is widely used by firms but not well understood by researchers (Jeffrey 2009; Long and Shields 2010; Incentive Federation 2011; Presslee et al. 2013). It also contributes to accounting research by showing how both economic preferences and information processing effects can affect employee performance and incentive scheme effectiveness (Bonner et al. 2000; Bonner and Sprinkle 2002). By showing that the effect of incentive type and payoff timing on performance depends on task type, the study provides evidence that cash paid in the near future is not always the most effective combination (H2, RQ1) as suggested by conventional economic theory (Samuelson 1937; Koopman 1960; Baker et al. 1988). Similarly, by showing that incentive type and payoff timing differentially affect perceived incentive attractiveness (Supplemental Analysis), the study highlights possible secondary benefits associated with deferred compensation (Loewenstein 1987; Nowliss et al. 2004). Finally, this study contributes to a growing body of research related to how creative task performance (H2, RQ1) is affected by the use of incentives (Kachelmeier et al. 2008; Kachelmeier and Williamson 2010).

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Figure 1
Experiment Timeline

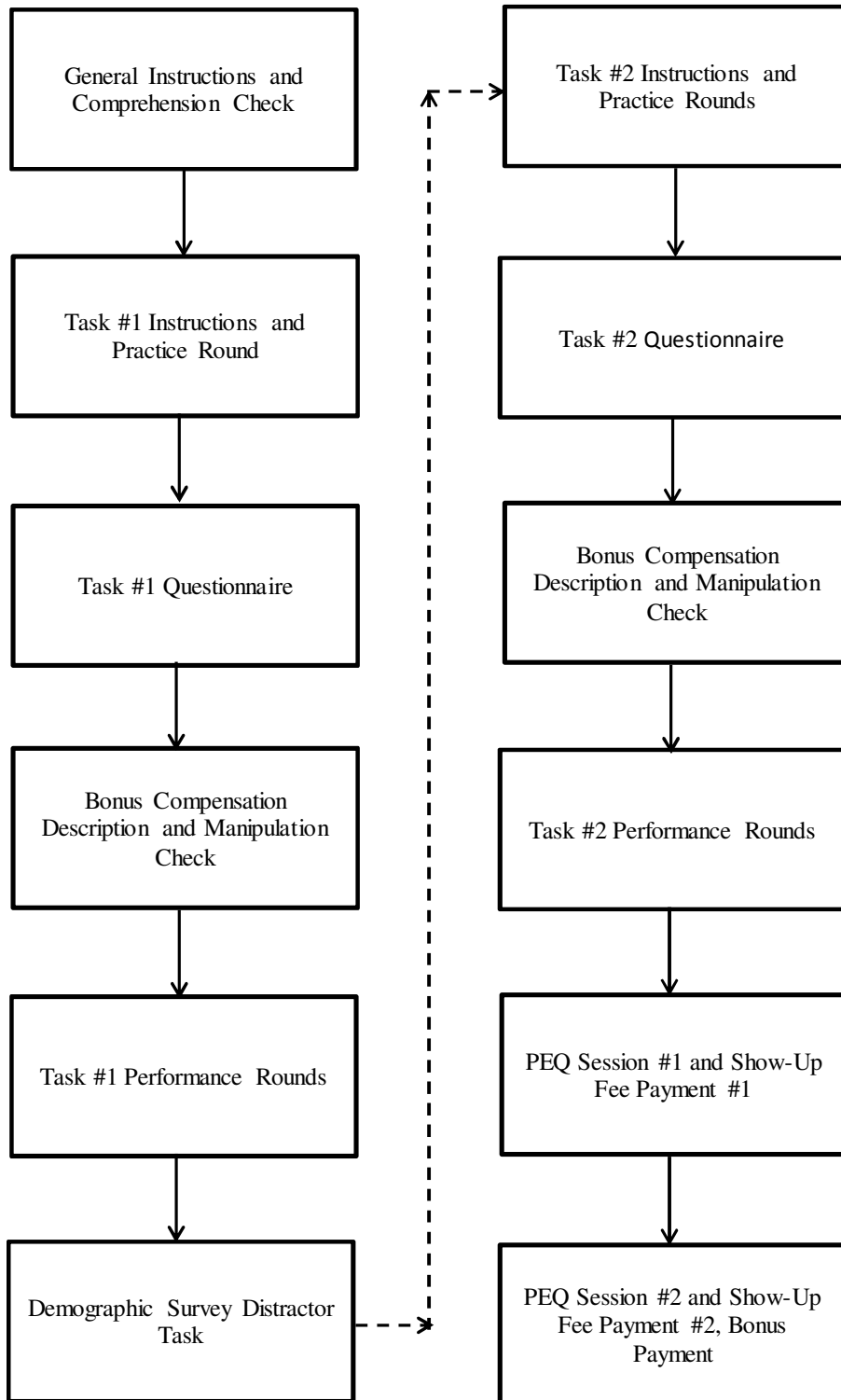
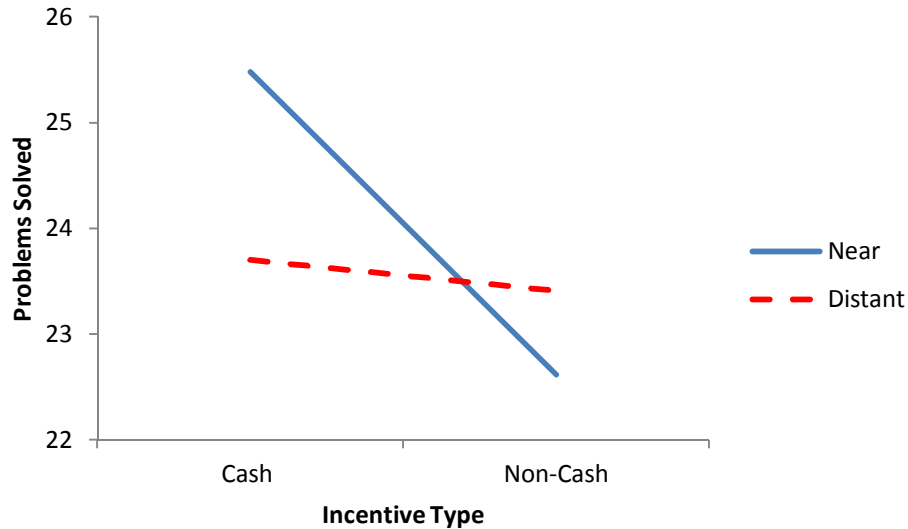


Figure 2
Problems Solved-Analytic (5 Rounds)



Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick's Sporting Goods.

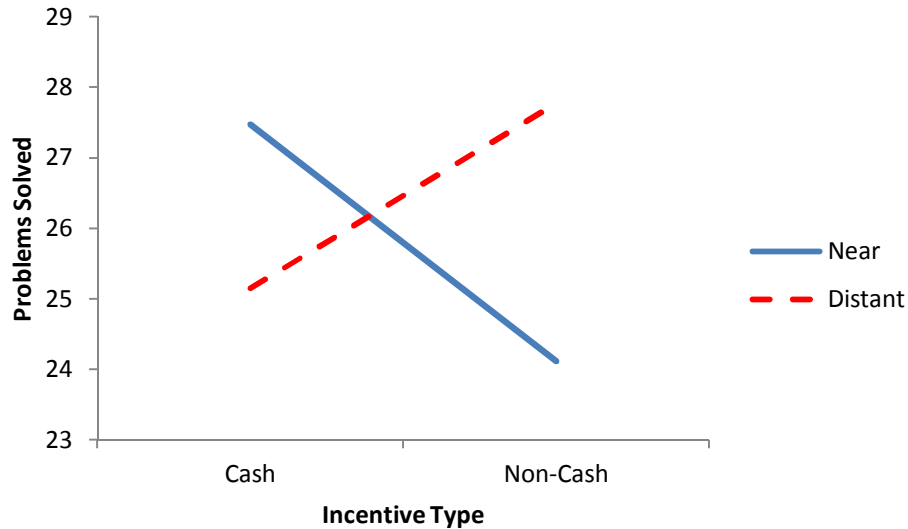
Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Problems Solved is equals the total number of problems that were solved over the five periods in each task.

Figure 3
Problems Solved-Creative (5 Rounds)



Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick's Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Problems Solved is equal to the total number of problems that were solved over the five periods in each task.

TABLE 1
Descriptive Statistics-Analytic Task
(Mean and Standard Deviation)

	Cash Incentives		Non-cash Incentives	
	Near Future (n=27)	Distant Future (n=27)	Near Future (n=26)	Distant Future (n=27)
Round 1	4.59 (1.37)	4.07 (1.49)	4.12 (1.48)	4.41 (0.93)
Round 2	4.74 (0.94)	4.81 (1.33)	4.65 (1.26)	5.07 (1.11)
Round 3	5.30 (1.10)	4.93 (1.44)	4.88 (1.31)	4.74 (1.16)
Round 4	5.37 (1.01)	4.96 (1.19)	4.31 (1.32)	4.74 (1.13)
Round 5	5.48 (1.12)	4.93 (1.36)	4.65 (1.26)	4.44 (1.01)
Total Problems Solved	25.48 (4.07)	23.70 (5.66)	22.62 (5.10)	23.41 (4.22)

Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash Incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick’s Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Problems Solved is the number of problem correctly solved.

TABLE 2
Descriptive Statistics-Creative Task
(Mean and Standard Deviation)

	Cash Incentives		Non-cash Incentives	
	Near Future (n=27)	Distant Future (n=27)	Near Future (n=26)	Distant Future (n=27)
Round 1	5.15 (1.73)	5.00 (2.27)	4.42 (2.37)	5.33 (2.04)
Round 2	5.00 (1.69)	4.85 (1.59)	4.62 (2.17)	5.37 (2.24)
Round 3	5.85 (2.09)	5.26 (1.91)	5.00 (2.17)	5.44 (2.04)
Round 4	5.89 (1.81)	5.19 (1.50)	4.73 (1.61)	5.85 (1.54)
Round 5	5.59 (2.18)	4.85 (1.82)	5.35 (1.98)	5.78 (1.81)
Total Problems Solved	27.48 (6.24)	25.15 (6.85)	24.12 (7.92)	27.78 (7.14)

Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash Incentives* .

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick’s Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Problems Solved is the number of problem correctly solved.

TABLE 3
Test of Hypotheses and Research Question

Panel A: H1: Problems Solved-Analytic Task (Rounds 1-5)

Value of Contrast*	Standard Error	t	Df	Significance (1-tailed)
6.72	3.21	2.10	103	.02

Panel B: H2: Problems Solved-Creative Task (Rounds 1-5)

Value of Contrast**	Standard Error	t	Df	Significance (1-tailed)
11.99	5.46	2.19	103	.02

Panel C: RQ1: Total Problems Solved-Creative Task- (Rounds 1-5)
(Cash Incentives-Near Future vs. Non-cash Incentives-Distant Future)

Mean Difference	Standard Error Difference	t	Df	Significance (2-tailed)
.30	1.83	.16	52	.87

Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash Incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick’s Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Problems Solved is equals the total number of problems that were solved over the five periods in each task.

*Contrast coefficients are 3 for *Cash Incentives-Near Future*, -1 for *Cash-Distant Future*, -1 for *Non-cash Incentives -Near Future* and -1 for *Non-cash Incentives -Distant Future*.

**Contrast coefficients are 2 for *Cash Incentives-Near Future*, -2 for *Cash-Distant Future*, -2 for *Non-cash Incentives-Near Future* and 2 for *Non-cash Incentives-Distant Future*.

TABLE 4
Intrinsic Task Interest
(Mean and Standard Deviation)

	Cash Incentives		Non-cash Incentives	
	Near Future (n=27)	Distant Future (n=27)	Near Future (n=26)	Distant Future (n=27)
Analytic Task Interest-Begin	3.56 (2.49)	3.74 (2.07)	3.31 (2.09)	3.48 (2.19)
Analytic Task Interest-End	3.63 (2.34)	3.56 (2.21)	3.38 (1.96)	3.19 (2.19)
Creative Task Interest-Begin	5.67 (2.09)	4.52 (2.28)	5.50 (1.86)	4.74 (1.81)
Creative Task Interest-End	5.63 (1.98)	4.89 (1.93)	5.54 (1.88)	5.41 (1.74)

Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash Incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick’s Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Analytic Task Interest-Begin is measured at the beginning of the analytic task after participants have performed several practice problems but have not received performance feedback. It assesses how interesting the analytic task is to participants using a seven-point semantic differential scale that ranges from 1 (not interesting) to 4 (moderately interesting) to 7 (very interesting).

Analytic Task Interest-End is measured at the end of the analytic task after participants have completed all five performance rounds and received performance feedback. It assesses how interesting the analytic task is to participants using a seven-point semantic differential scale that ranges from 1 (not interesting) to 4 (moderately interesting) to 7 (very interesting).

Creative Task Interest-Begin is measured at the beginning of the creative task after participants have performed several practice problems but have not received performance feedback. It assesses how interesting the creative task is to participants using a seven-point semantic differential scale that ranges from 1 (not interesting) to 4 (moderately interesting) to 7 (very interesting).

Creative Task Interest-End is measured at the end of the creative task after participants have completed all five performance rounds and received performance feedback. It assesses how interesting the creative task is to participants using a seven-point semantic differential scale that ranges from 1 (not interesting) to 4 (moderately interesting) to 7 (very interesting).

TABLE 5
Responses to Post-Experiment Questions
(Mean and Standard Deviation)

	Cash Incentives		Non-cash Incentives	
	Near Future (n=26)*	Distant Future (n=26)*	Near Future (n=23)*	Distant Future (n=22)*
Anticipated Enjoyment- Session 1	6.00 (1.47)	6.08 (1.35)	5.35 (1.70)	5.23 (1.85)
Anticipated Enjoyment- Session 2	5.81 (1.33)	6.23 (1.14)	5.91 (1.16)	6.18 (1.05)
Future Thinking	4.23 (1.86)	4.96 (1.54)	4.91 (2.02)	5.45 (1.44)
Discuss with Others	2.58 (2.02)	3.23 (1.93)	3.43 (2.31)	3.86 (1.91)

Variable Definitions

Incentive Type is manipulated between subjects at two levels: *Cash Incentives* and *Non-cash Incentives*.

Participants in the *Cash Incentive* condition are provided performance bonuses consisting of cash.

Participants in the *Non-cash Incentive* condition are provided performance bonuses consisting of Lifestyle Reward points. Lifestyle Reward points can be redeemed at AMC Theaters, Cheesecake Factory and Dick’s Sporting Goods.

Payoff Timing is manipulated between subjects at two levels: *Near Future* and *Distant Future*.

Participants in the *Near Future* payoff condition receive their performance bonus on the day after their session. Participants in the *Distant Future* condition receive their performance bonus 6 weeks after their session.

Task Type is manipulated within subjects at two levels: *Analytic Task* and *Creative Task*. *Analytic Task* consists of alpha-numeric decoding problems. *Creative Task* consists of Remote Associate Test word problems.

Anticipated Enjoyment-Session 1 is measured in the post-experiment questionnaire at the end of Session 1. It measures how much the participants anticipate that they will enjoy using their incentive bonus using a seven-point semantic differential scale that ranges from 1 (not enjoyable) to 4 (moderately enjoyable) to 7 (very enjoyable).

Anticipated Enjoyment-Session 2 is measured in the post-experiment questionnaire at the end of Session 2. It measures how much the participants anticipate that they will enjoy using their incentive bonus using a seven-point semantic differential scale that ranges from 1 (not enjoyable) to 4 (moderately enjoyable) to 7 (very enjoyable).

Future Thinking is measured in the post-experiment questionnaire at the end of Session 2. It measures how frequently the participants anticipate that they will think about using their incentive bonus using a

seven-point semantic differential scale that ranges from 1 (not frequently) to 4 (moderately frequently) to 7 (very frequently).

Discuss With Others is measured in the post-experiment questionnaire at the end of Session 2. It measures how frequently the participants discussed their incentive bonus with others using a seven-point semantic differential scale that ranges from 1 (not frequently) to 4 (moderately frequently) to 7 (very frequently).

* *n* consists of those participants that showed-up for the second session and responded to the second post-experiment questionnaire.

Appendix A Incentive Bonus Description-Cash

Participation in today's session qualifies you for a **cash** performance bonus. For every correctly solved problem, you earn a \$1 **cash** credit. You can earn a maximum performance bonus of \$45 in **cash**. The performance bonus will be paid **tomorrow/6 weeks** from now during the second session or at a later date that is convenient to you. Further information about the second session will be provided at the end of today's session.

Your performance bonus will be based on how well you perform of one of the two tasks in today's session. The task that is used to determine your bonus will be randomly selected at the end of today's session. Because the task that is used to calculate the bonus is randomly selected, it is important to exert effort while performing both tasks.



Incentive Bonus Description-Non-Cash

Participation in today's session qualifies you for a **Lifestyle Rewards** performance bonus. **Lifestyle Rewards** are store credits that can be used to make retail purchases related to entertainment, specialty foods and recreation. The performance bonus will be paid **tomorrow/6 weeks** from now during the second session or at a later date that is convenient to you. Further information about the second session will be provided at the end of today's session.

For every correctly solved problem, you earn one **Lifestyle Rewards** credit. Each **Lifestyle Rewards** credit has a \$1 retail value. You can earn a maximum performance bonus of 45 **Lifestyle Rewards** credits. You can redeem your **Lifestyle Rewards** at AMC Theaters, Cheesecake Factory and Dick' Sporting Goods.

Your performance bonus will be based on how well you perform of one of the two tasks in today's session. The task that is used to determine your bonus will be randomly selected at the end of today's session. Because the task that is used to calculate the bonus is randomly selected, it is important to exert effort while performing both tasks.



Appendix B Task Screenshot-Analytic










Performance Round 1 Remaining Time 16	
SOLVE	23-91-42-13-85-74-23-28-1-58
SOLVE	83-75-58-84-23-1-13-91-84-22
SOLVE	42-51-74-11-91-58-47-75-85-8
SOLVE	97-84-11-8-75-13-86-53-84-31
SOLVE	1-97-74-13-29-16-51-44-37-86
SOLVE	86-74-42-83-97-29-85-47-37-75
SOLVE	23-74-8-22-28-44-11-83-51-31
SOLVE	37-62-42-23-53-84-8-75-62-1
SOLVE	29-58-85-42-85-37-75-42-13-44
Please use the <u>green</u> Performance Round 1 decoding key.	

Round 1 Decoding Key

1	8	11	13	16	22	23	28	29	31	37	42	44
P	Z	B	V	J	U	Q	T	A	K	X	L	D

47	51	53	58	62	74	75	83	84	85	86	91	97
F	Y	I	C	W	O	M	N	S	E	G	H	R

Task Screenshot-Creative

Performance Round 3 Remaining Time 167	
	Fish-Mine-Rush
	Sleeping-Bean-Trash
	Fur-Rack-Tail
	Boat-Limit-High
	Rock-Hat-Ware
	Worm-Shelf-Text
	Egg-Collar-Wash
	Hound-Pressure-Shot
	Movie-Trek-Rock
Performance Round 3	