The Effects of Tiered Goals and Bonus Pay on Performance

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THE EFFECTS OF TIERED GOALS AND BONUS PAY ON PERFORMANCE

by

Jessica L. Urschel

A dissertation submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
Psychology
Western Michigan University
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This study examined the relative effects of tiered goals, difficult goals, and moderate goals on performance when individuals earned bonus pay for goal achievement. The experimental design was a 3 x 2 mixed factorial design. Participants were 44 undergraduate students performing a computerized data entry task that simulated the job of a medical data entry clerk. For each session, participants were paid a $4 base salary plus bonus pay contingent on goal achievement. Participants were randomly assigned to 1 of 3 groups: a) a multiple, tiered goal level condition, in which participants earned $1 in bonus pay for achieving an easy goal, $2 for achieving a moderate goal, or $3 for achieving a difficult goal, b) a difficult goal condition, in which participants only had the opportunity to earn $3 for achieving the difficult goal, or c) a moderate goal condition, in which participants only had the opportunity to earn $2 for achieving the moderate goal.

Results of a homogeneity of regression slopes test showed that the effects of the goal depended on participants’ performance levels in a “do your best” covariate session before the goals were introduced. After the data for the difficult and tiered goal conditions were pooled, a picked points analysis revealed that for both the lowest and average performers, tiered and difficult goals produced significantly higher performance than moderate goals, $X=21, F(1, 40) = 6.57, p = .014$ and $X=208, F(1, 40) = 9.26, p =$
.004, respectively, in the first of five experimental sessions. Tiered and difficult goals did
not produce significantly higher performance than moderate goals for the highest
performers in the first session. No significant differences were found for the last session.
These results suggest the importance of within-subjects factors to determine the effects of
goals over time.

The goals in this study were much easier to achieve than planned. Future research
should compare the effects of moderate and difficult goals to tiered goals with goals that
are more indicative of goals defined as such in the literature.
ACKNOWLEDGMENTS

This dissertation would not have been possible without a great deal of support from my advisors, colleagues, and friends. I have been lucky enough to learn a great deal from each of my committee members, both inside and outside of the classroom. First and foremost, Dr. Alyce Dickinson has provided unwavering support and extensive feedback on this manuscript and on all issues that arose during my graduate career. Both she and Dr. Bradley Huitema have been exceptional advisors, role models, editors, cheerleaders, and friends during the last seven years. Dr. Huitema has my gratitude for looking past my undergraduate GPA and recognizing my potential as a graduate student, teaching assistant, and instructor, while Dr. Dickinson has my thanks for her continued insistence that I should pursue a Ph.D. Drs. Doug Johnson and Julie Slowiak have provided thoughtful, invaluable feedback on this manuscript, and I am now lucky enough to teach alongside Dr. Slowiak at the University of Minnesota Duluth, where she has been an exceptional mentor. I would also like to thank my research assistants, Bethany Anderson, Amber Derthick, and Quan Zhang for their long hours in the lab, obsessive calendar checking, and surprisingly positive attitudes towards data collection.

I dedicate this manuscript to the original Mr. Mom, John Urschel. I credit so much of my success to his insatiable thirst for knowledge, and thank him for going back to college and taking his nine-year-old daughter along at every opportunity. I have caused more than a few gray hairs over the years so I also express my gratitude for his incredible patience and love.

Kate Siupinski and Kevin Dennis also deserve many, many thanks for their
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Jessica L. Urschel
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INTRODUCTION

Goal setting is frequently used to increase performance in organizational behavior management (OBM) interventions (Anderson & Crowell, 2003; Fellner & Sulzer-Azaroff, 1984; O’Hora & Maglieri, 2006) and is often used in conjunction with feedback and behavioral consequences in multicomponent interventions (Alvero, Bucklin, & Austin, 2001). The authors of several articles in the *Journal of Organizational Behavior Management (JOBM)* have discussed the possible behavioral functions of goal setting and goal attainment (Agnew, 1998; Fellner & Sulzer-Azaroff, 1984; Malott, 1993; O’Hora & Maglieri, 2006). While industrial/organizational (I/O) psychologists and management researchers have conducted many controlled experiments to determine the most effective goal characteristics (Locke & Latham, 2012), such analyses are rarely conducted in OBM.

**Behavioral Functions of Goals**

The analysis of goals as motivating operations, discriminative stimuli, and conditioned reinforcers parallels earlier analyses of feedback. In his behavioral analysis of performance feedback, Peterson (1982) stated, “It [feedback] is, first and foremost, a physical stimulus, irrespective of which form it takes, and therefore could have some or all of the possible effects of any stimulus,” depending on the history of conditioning (p. 101). Similarly, Duncan and Bruwelheide (1985-1986) stated that “an operant perspective suggests that feedback is either a form of reinforcement or stimulus control, depending on the situation in which it occurs” (p. 97). Authors discussing the behavioral functions served by goals and goal attainment have made similar analyses.
Agnew (1998) argued that goals function as motivating operations in the workplace and provided specific examples to illustrate her analysis. More generally, as motivating operations, goals can increase the reinforcing value of goal attainment and signs of progress toward goal attainment as well as evoke behaviors that have led to goal attainment and signs of progress toward goal attainment in the past. Fellner and Sulzer-Azaroff (1984) contended that goals gain discriminative control when they are correlated with consequences contingent on performance in relation to that goal. They also argued that a goal may acquire discriminative control due to instructional control even when an appropriate reinforcement history with goals is lacking.

Fellner and Sulzer-Azaroff (1984) also stated that goals, or goal attainment, might function as conditioned reinforcers due to having been paired with other conditioned reinforcers such as praise, nonmonetary rewards, and monetary incentives. After mentioning that goal attainment could come to function as a conditioned reinforcer, however, they restricted their analyses to the goal themselves, stating, “For example, if meeting the goal is paired frequently with a positive consequence or removal of a negative stimulus, the goal [italics added] can function as a conditioned reinforcer” (p. 35). Although the goal could function as a conditioned reinforcer for some behavior (e.g., looking at a graph with a goal line), it is more likely that goal attainment and stimuli associated with progress toward goal attainment would acquire reinforcing value for the relevant work performance, with the goal, an antecedent, serving as a motivating operation or discriminative stimulus. Once goal attainment is established as a conditioned reinforcer, attainment may function as a reinforcer many times without pairing with other
conditioned reinforcers. In order for attainment to continue to function as a reinforcer, however, it must be paired with additional reinforcers at least occasionally.

Employees typically do not receive feedback on goal attainment until days or weeks after responding, a delay much too great for feedback (or goal attainment) to be a part of any direct-acting contingency from a molecular perspective. According to this perspective, in order to function as a discriminative stimulus, the presentation of the stimulus would have to evoke behavior within seconds (e.g., Blakeley & Schlinger, 1987; Michael, 2004). A goal does not usually evoke a response within seconds. Similarly, in order for goal attainment to function as a conditioned reinforcer, it must follow work behaviors within seconds, a situation not often present. There are, however, exceptions. For example, Goomas and Ludwig (2007) provided feedback for goal-related performance immediately and automatically. With the advent of new technology, temporal contiguity between performance and feedback is likely to increase in work settings.

Malott’s (1993) analysis of indirect-acting contingencies relating to rule-governed behavior might explain the behavioral function of a goal. Malott argues that most contingencies in organizations are ineffective because of the long delays between behaviors and consequences. In order to bridge this temporal gap, employees state private, immediate verbal descriptions called rule statements. Rule statements control goal-directed behavior until the delayed consequence is provided. If consequences are contingent and sizable, Malott argues that goal statements can bridge the temporal gap between behavior and consequence.
Schlinger (2008) stated that rules function as function-altering, contingency-specifying stimuli. Goals may change the evocative function of other antecedent stimuli. For example, the supervisor’s statement that a goal now exists and goal attainment will be rewarded can change the function of the sight of a written goal, a goal line on a graph, and stimuli related to work performance from neutral stimuli to discriminative stimuli or motivating operations. The employee’s echoic statement of the rule may also serve as a function-altering rule. The goal-related stimuli, when presented, would then evoke behavior immediately.

O’Hora and Maglieri (2006) proposed an explanation of goal setting within relational frame theory (RFT) based on Hayes, Barnes-Holmes, and Roche (2001). The authors argued that environmental “stimuli participate in derived relations with words in presented rules and the functions of those stimuli are transformed such that when a person comes into contact with the transformed stimuli, particular responses may then be controlled by them” (O’Hora & Maglieri, 2006, p. 147). From this perspective, goals evoke self-statements describing the ongoing relation between a person’s current performance and a goal. As the discrepancy between the goal and performance decreases, the self-statement that describes the difference serves as derived reinforcement for the goal-directed performance (Tammemagi, O’Hora, & Maglieri, 2013).

Goal Setting Theory

In an edited volume synthesizing the results of more than 50 years of goal setting research, Locke and Latham (2013) defined a goal as “the object or aim of an action” (p. 4). According to Locke and Latham, all mental events, including the formation of the goal-performance relationship, are comprised of two dimensions, content and intensity.
“Content is the object or result of the goal… Intensity refers to the effort needed to set a goal, the position of the goal in an individual’s goal hierarchy, and the extent to which a person is committed to goal attainment” (Locke & Latham, 2013, p. 5). Their analysis yielded two core findings: (1) there is a positive linear relationship between goal difficulty and performance, and (2) specific, difficult goals produce higher performance than general or “do your best” goals.

Locke and Latham (1990, 2013) posited four mediating variables through which goals affect performance: choice/direction, effort, persistence, and knowledge/task strategy. Provided the individual accepts the goal, the goal statement first orients the individual towards the task for which the goal was set, decreasing the individual’s orientation towards other, unrelated tasks. Second, once the individual has decided to act on the goal, effort is activated and expended in proportion to goal difficulty level. Third, goal setting affects behavior through the mechanism of persistence, measured as the time an individual will spend on attempting to reach the goal. A specific, difficult goal provides higher persistence rates than “do your best” or easy goals. Last, Locke and Latham argued that effective goals cue the individual to use knowledge and skills that he or she already possesses. Locke and Latham cited employee innovations in Latham and Baldes (1975) and Latham and Saari (1982) as examples of knowledge and skill activation. In Latham and Baldes (1975), logging truck drivers modified their trucks in order to measure the weight of their loads accurately and to achieve their specific, difficult weight goal. In Latham and Saari (1982), logging truck drivers coordinated their loading times via CB radio in order to increase the total number of trips to the lumber mill each day.
Locke, Shaw, Saari, and Latham (1981) argued that although behaviorism was a comprehensive theory, it oversimplified human behavior by reducing its explanations to “physical events alone” (p.126). Locke et al. continued:

Goal setting might be called "stimulus control" by a modern behaviorist, but the key question then becomes, What is the stimulus? If it is only an assigned goal (an environmental event), then the importance of goal acceptance is ignored; an assigned goal that is rejected can hardly regulate performance. If goal acceptance is considered relevant, then the regulating stimulus must be a mental event—ultimately the individual's goal. (Locke et al., 1981, p. 126)

Locke et al.’s first assumption that modern behaviorists believe all stimuli are physical does not acknowledge the fundamental difference between methodological and radical behaviorism. While methodological behaviorists do not ascribe causality to unobservable stimuli, radical behaviorists regard all stimuli, public and private, capable of acquiring stimulus control (Moore, 2001).

As Cooper, Heron, and Heward (2007) stated, “A stimulus acquires control only when the responses emitted in the presence of that stimulus produce reinforcement more often than responses in the absence of stimulus” (p. 393). As with any stimulus, a goal statement will only gain stimulus control when the individual has an appropriate reinforcement history with goals or instructional control (Fellner & Sulzer-Azaroff, 1984). Behaviorists have argued that goals and signs of progress toward goal attainment may control goal-related behavior through a variety of behavioral functions, but both perspectives agree that a goal may be ineffective. Fellner and Sulzer-Azaroff (1984) stated, “Goal setting alone may be ineffective because the behavior of concern has been
inadequately differentially reinforced in the presence of the goal” (p. 42). From this perspective, it follows that the same goal statement would produce varying effects on performance based on individuals’ varied reinforcement histories.

Rather than focus on the individual’s history, goal setting theory focuses on the individual’s mental events that occur after the goal has been set. Locke et al. (1981) argued that goal commitment is the first and most important factor in determining whether a goal will affect performance. According to goal setting theory, goal commitment is a mediating mental event in which the individual accepts or rejects the goal. In addition to this initial acceptance, subsequent variables may influence goal commitment and therefore, the relationship between goals and future goal-directed performance. Lee, Locke, and Phan (1997) and Mowen, Middlemist, and Luther (1981) found a significant mediating effect of goal commitment on the goal-performance relationship. Klein, Cooper, and Monahan (2012) found that when goal level is held constant at a moderate or difficult level, there is a significant main effect of goal commitment on performance levels across many laboratory simulations and in organizational settings. In a meta-analysis of goal commitment-performance research, Klein, Wessen, Hollenbeck, and Alge (1999) found an average effect size of $d = .23$ for studies measuring goal commitment and performance. Based on Cohen (1988), $d = .23$ is classified as a small effect.

Scales of differing lengths have been used to measure participants’ goal commitment, but this construct is generally measured using the participant’s self-reported level of agreement with such statements as “I am committed to this goal,” before the session begins. The Klein, Molloy, Cooper, and Swanson unidimensional target-free
(KUT) scale is a simple, validated four-item measure (Klein et al., 2013). In the current study, the KUT scale was administered to participants before each experimental session. Participants’ responses on the KUT scale were hypothesized to have a strong positive linear relationship with performance, though this association should be interpreted conservatively. Responses on the KUT scale should be more accurately interpreted as an approximation of private self-statements bridging the temporal gap between the goal statement and goal-directed behavior. A strong linear relationship between responses on the KUT scale and performance levels does not provide strong evidence of a mediating mental event or the existence of the goal commitment construct.

**Goal Difficulty**

Goal setting theorists recommend using specific, difficult goals (Locke & Latham, 2013). Latham and Locke (1979) first theorized a positive, linear association between goal difficulty and performance; that is, the more difficult the goal, the higher the performance. However, Locke and Latham (2007) amended their earlier argument by stating that this linear, positive relationship holds true only as long as employees find goal achievement attractive (i.e., goal commitment) and believe that achieving the goal is possible (i.e., self-efficacy). Therefore, in order to produce maximum performance, employers should choose goals that are difficult, yet achievable. Challenging yet achievable goals have been defined as those achievable by 20% to 50% of individuals (Fasteas & Hirst, 1992; Merchant & Manzoni, 1989). Therefore, the “one goal for all” groups in the current study were set at expected probabilities of .50 (moderate goal group) and .17 (difficult goal group), based on data from previous studies. No low “one goal for all” group was included.
Stretch goals are designed to be achieved by less than 10% of employees at most (Daniels, 2009) and may be viewed as unachievable by all employees, based on past performance (Sitkin, See, Miller, Lawless, & Carton, 2011). Several notable companies have attributed significantly increased profits to the stretch goal approach, including Toyota, GE, and Goldman Sachs (Kerr & Landauer, 2004; Kerr & LePelley, 2013). However, positive effects of stretch goals are largely anecdotal, overemphasized, and not at all controlled (Daniels, 2009; Sitkin et al., 2011). Studies have found negative effects of stretch goals, including repeated failure and decreased performance over time (Chow, Lindquist, & Wu, 2001; Fisher, Peffer, & Sprinkle, 2003). Daniels argued that when stretch goals seem to produce positive effects, the increase is actually caused by variables implemented simultaneously with the stretch goal, including task clarification, feedback, opportunities for recognition, and monetary incentives.

There are three behavioral problems with impossible goals. First, employees may experience punishment in the form of supervisory criticism. Second, the responses leading to high performance are subject to extinction because the goal has not been met and reinforcement has not been obtained. Finally, the employee can experience punishment in the form of signs of failure (e.g., written feedback showing the goal has not been met). Traditional I/O psychologists have also predicted several negative psychological effects of stretch goals, including decreased self-confidence and increased negative emotions such as inadequacy (Williams, 2011), and an adverse effect on work-life balance (Kerr & LePelley, 2013; Sherman, 1995).

According to Daniels (2009), “…the best mistake in setting a goal is to set it too low” (p. 41). Locke and Latham (1984) agreed, stating,
Nothing breeds success like success… A primary purpose of goal setting is to increase the motivation level of the individual. But goal setting can have precisely the opposite effect if it produces a yardstick that constantly makes the individual inadequate. (p. 21)

If goals are set using higher expected probabilities, employees are more likely have an opportunity for reinforcement, provided that positive consequences are contingent upon goal achievement. Reinforcement contingent upon goal attainment increases the frequency of engaging in goal-directed behavior, thereby increasing performance.

The Performance Matrix, described by Daniels and Bailey (2014), evolved from Riggs and Felix’s (1983) objectives matrix and Kaplan and Norton’s (1996) balanced scorecard. The Performance Matrix adopts a multiple level, tiered goal approach to assess employee performance on a number of target behaviors and outcomes, or “pinpoints.” Daniels and Bailey (2014) recommended defining a maximum of seven of these pinpoint, which constitute 80% of the job’s responsibilities. Each pinpoint is assigned a relative weight, based on the organization’s priorities. The Performance Matrix assigns increasing point values to these increasing performance levels, often on a 4-13 point scale. If a 4 to 13 scale is used, the current level of performance corresponds to 5 points, and the goal level corresponds to 10 points. Daniels and Bailey (2014) argued that employees that prefer the opportunity to earn up to 13 points for exceptional performance. Points can be used to determine the level of rewards, including monetary incentives.

Abernathy (1996) described a similar multiple level, tiered goal approach to assess employee performance. Abernathy has referred to his assessment tool as both the
Performance Matrix and the Performance Scorecard. Abernathy’s Performance Scorecard, like Daniels and Bailey’s (2014) Performance Matrix, is based on Riggs and Felix (1983) and Kaplan and Norton (1996). Abernathy recommended using this tool as a basis for distributing rewards, including monetary incentives. Abernathy (2011) suggested identifying two to seven measures on which the employee has direct influence. Current performance is labeled as the base of the performance scale, and the level of performance needed to earn maximum incentive pay is labeled as the goal. The goal should equal the performance levels required for the organization to meet its organizational scorecard goals. Scale intervals on the Performance Scorecard range from -20% of current performance to 100% of goal performance. Points are assigned for each measure based on performance level and priority-based weight and an overall performance index is calculated.

Unlike in the Performance Matrix, there is no reward or incentive for performing above the goal level in the original version of the Performance Scorecard (Abernathy, 1996). Abernathy argued that if employees were able to earn additional rewards for performing above the goal, they would be able to perform exceptionally well on some measures and poorly on others, and still receive maximum payout. This would, in turn, affect the organization’s ability to achieve its goals. However, in Abernathy (2011), several variants of the original scale are introduced and discussed, including the -20% to 100%, 0% to 100%, and 0% to 120% scales.

Tiered goal approaches such as the Performance Matrix, the Performance Scorecard, and the contingent bonus pay approach used in the current study would alleviate the problems of a difficult, “one goal for all” approach by allowing employees
to contact reinforcement at several levels of performance. If employees do not have the
tility to reach the most difficult goal, but reach a lower tiered goal, responses leading to
higher performance would be reinforced through goal attainment and consequences
contingent on goal attainment, either in the form of points earned or bonus incentives.

Bateman and Ludwig (2003) used a variant of the tiered goal approach and
monetary incentives in a multicomponent intervention to decrease selection errors in a
warehouse distribution center. The authors adapted an existing incentive system by
adding increasingly difficult goals on the number of selection errors per 1,000 boxes, as
well as weekly, publicly posted individual error rates. During the intervention, average
errors showed a downward trend corresponding to the increasingly difficult goals, with
an overall mean decrease of 10% from baseline to intervention. The largest decrease in
the number of selection errors was shown for mid-level performers.

Rather than providing employees with multiple, concurrent goals of differing
difficulty, Bateman and Ludwig (2003) used a changing criterion ―one goal for all‖
approach, in which goals became progressively more difficult for employees as the study
goals, stating,

Tiered stretch goals, a recent innovation in the research, are more effective than
non-tiered ones (Bateman and [sic] Ludwig, 2003) … Tiered goals may work
better than non-tiered goals simply because they are more realistic. (p. 44)

Daniels (2009) warns against the changing criterion goal, which he refers to as
“ratcheting,” continuing,
Because tiered stretch goals are based on the average performance of multiple groups, it is likely that many employees do not meet these either. Deterioration in performance is expected after employees fail to reach the goals because positive reinforcement is absent. Even when employees reach the first stretch goal, it has to be somewhat daunting to face the prospect of yet another low-probability goal. (pp. 44-45)

In the current study, tiered goals are presented concurrently. If employees do not have the ability to reach the most difficult goal, but reach a lower tiered goal, their performance is still rewarded. Additionally, meeting low goals and receiving bonus pay may motivate individuals to attempt higher goals. According to Daniels (2009), “...the best mistake in setting a goal is to set it too low. By setting it low you increase the probability of success. By rewarding goal attainment you increase motivation and achieve subsequent goals” (p. 41).

Unfortunately, OBM has produced few empirical analyses that suggest how difficult is too difficult, but the possible aversive contingencies described are supported in previous research. In Bandura and Cervone (1983), specific, difficult goals decreased accuracy on tasks when participants were asked to perform a novel task with many possible strategies (i.e., stock market role-playing tasks). Earley, Connolly, and Ekegren (1989) also found that specific, difficult goals increased time spent on strategy but decreased the participants’ prediction accuracy in another stock market role-playing task.

Tammemagi et al. (2013) examined level of goal difficulty and persistence towards an unattainable goal using a modified version of the experimental task used in the present study. The authors used an ABACX design, in which A = baseline, B =
randomly assigned goal condition that consisted of either a high, unattainable goal or a low, attainable goal (based on pilot study data), C = alternate to the first goal, and X = participant’s choice of either goal condition. Each of the five conditions consisted of three 4-minute work sessions; therefore, participants worked for a total of 60 minutes.

Although 20 out of 26 participants chose the low goal over the high, unattainable goal in the final condition, the high goal condition produced the greatest increase in performance compared to baseline conditions or the low goal condition. In the high goal first group, performance increased 21% immediately when the goal was introduced; in the low goal first group, performance increased 11% immediately when the goal was introduced. Persistence results varied by participant. The authors suggested longer work sessions over a longer period of time to further investigate goal persistence. The current study examined performance and persistence over five, 45-minute experimental sessions.

**Bonus Pay and Goals**

Mowen et al. (1981) examined the effects of goal difficulty level and type of incentive system (piece rate versus salary plus bonus) on performance on a laboratory-based task. The dependent variable was the number of correctly completed arithmetic problems (adding columns of six, four-digit numbers) in one 40-minute session. One hundred twenty-four undergraduates were randomly assigned to one of six conditions: participants either received per piece incentive pay or base plus bonus pay contingent on goal achievement. Within each pay system, participants were assigned one of three goal difficulty levels: very easy, moderate, or very difficult. In the incentive pay system, participants were given one poker chip in exchange for every correctly completed problem, regardless of assigned goal level or whether or not they achieved the assigned
goal. In the bonus pay system, all participants received a base salary of 15 chips. Those in the low goal group would earn an additional 15 chips for completing the very easy goal, based on the number of arithmetic problems all participants completed in a pilot study. The expected probabilities of goal achievement, based on pilot study data, were 1.00 (easy goal, 15 chip bonus), .50 (moderate goal, 40 chip bonus), and .00 (difficult goal, 90 chip bonus). All bonus pay participants earned 1 poker chip for all problems completed above the goal in order to keep total pay equivalent across goal achievers in both pay systems. At the end of the session, poker chips were exchanged for small office supplies. The participants also completed a short posttest measuring desirability of office supplies as payment, understanding of the pay structure, and confidence that the participant could reach his or her assigned goal.

Mowen et al. (1981) controlled for pre-existing differences across the conditions using three covariates: (1) perceived ability (i.e., participant’s self-reported likelihood of achieving the goal), measured using a 7-point Likert scale administered prior to the session, (2) actual ability, measured using the number of arithmetic problems completed in 5-minute practice session, and (3) accuracy, measured using the number of mistakes made in the 5-minute practice session. The adjusted means showed a significant interaction effect of pay system and goal difficulty on performance. In very easy and moderate goal conditions, the bonus incentive produced higher rates of performance than the piece rate incentive. However, in the very difficult goal level, the piece rate incentive produced the highest performance of any condition, and the bonus-very difficult goal condition produced lower performance than either the bonus-low goal or bonus-moderate goal conditions. In the bonus pay conditions, the very easy goal resulted in the highest
performance, though not significantly higher than the moderate goal. The combination of bonus incentive and very difficult goals resulted in significantly lower performance than the combination of bonus incentive and easy or moderate goals. This is consistent with Daniels’ (2009) argument for low goals, rather than very difficult ones. Mowen et al.’s results suggest that the bonus pay system used in the current study would produce higher performance levels when paired with the level 2, moderate goal than with the level 3, difficult goal. However, Mowen et al. selected a stretch goal as their high goal condition (0% achievement in pilot study), rather than a difficult, but achievable goal as defined by Locke and Latham (2013). In the present study, the difficult goal was based on the number of records the top 17% of performers could correctly complete.

The current study used money, rather than school supplies, as payment for experimental sessions and measured the effects of tiered goals, moderate, and difficult goals over five, 45-minute sessions. It was predicted that the effects of goal difficulty would be more pronounced than those in Mowen et al. (1981) because of the increased desirability of monetary incentives and repeated experimental sessions. It was expected that difficult goals would have a negative effect on performance over time.

Miller and Steele (1984) attempted to replicate the results of Mowen et al. (1981) but failed to find an interaction between pay system and goal difficulty. Lee et al. (1997) attributed the lack of effects due to the lack of in-session feedback provided by Mowen et al. (1981).

Lee et al. (1997) investigated the interaction between pay system and goal difficulty with feedback on performance in an extension of Mowen et al. (1981). Lee et al. (1997) compared piece-rate, bonus, and hourly wage systems under three levels of
goal difficulty: easy (.90 expected probability based on pilot study data), moderate, (.50), and difficult (.10). Participants were 102 paid undergraduates, and the number of correctly completed problems was the primary dependent variable. Performance from a 5-minute practice session was used as a covariate. After the practice session, participants were given their assigned goals, asked for their personal goals, asked whether they expected to reach several levels of performance as a measure of self-efficacy, and asked to report their level of commitment to the assigned goal. After completing these questionnaires, participants worked for 10 minutes on the task and graded their own work based on experimenter-provided answers. Before completing another 10-minute session, participants were assigned to goals higher than session 1. Again, these goals were based on normative data from the pilot study, this time from session 2 (.10, .50, and .90 expected probabilities). For both trials, those participants under the bonus incentive with easy goals produced the lowest average performance. The bonus incentive produced the highest rates of average performance when paired with the moderate goal.

Lee et al. (1997) found significant, positive correlations between self-efficacy, personal goals, and task performance across all conditions. Participants in the current study were asked to describe any personal goals as part of a pre-session questionnaire. Participants’ answers to these questions were analyzed to determine (a) whether there is a higher correlation between personal goals and performance than between assigned goals and performance (replication of Lee et al., 1997), and (b) whether there are differences in stated personal goals among goal types or over time.

Based on the results of Lee et al. (1997), it was hypothesized that those participants randomly assigned to the moderate difficulty goal should perform higher
than those in the difficult goal. However, the tiered goal group was expected to produce higher average performance levels than either moderate or difficult goal groups.

**Ability-Based Goals**

Locke and Latham (2013) argued that, holding all other variables constant, there is a strong positive, linear relationship between assigned goals and performance levels. However, employers cannot hold their employees’ ability levels constant. Therefore, difficult goals are likely to produce repeated failure and decreased performance over time for many employees (Chow et al., 2001; Daniels, 2009; Fisher et al., 2003). In order to avoid these negative effects, some researchers have argued for an ability-based approach to goal setting.

Using a combination of archived performance data and self-report questionnaire data from 476 employees across four call centers, Webb, Jeffrey, and Schulz (2010) examined the effects of using a menu of three goal choices from which employees could choose their own performance goals. Employees self-selected their goal from the three goal levels. These goal levels were developed by management and a consulting firm in order to “(1) provide an incentive for employees to select a goal that was compatible with their performance capabilities; and (2) motivate lower performing employees to improve performance…” (p. 225).

The three goals presented for selection differed in terms of difficulty and contingent bonus pay. This incentive system was “all or nothing.” If the employee did not reach his or her self-selected goal, he or she did not receive any bonus pay, regardless of whether the employee achieved goals of lower difficulty. The incentive system provided
no additional rewards for continuing to work after the employee achieved his or his self-selected goal.

Webb et al. (2010) found that implementation of the goal/bonus pay system was associated with a significant increase in overall performance across the four call centers. Only 58% of employees were able to meet their self-selected goals, though previous research found self-selected goal achievement rates of approximately 80% (e.g., Gibbs, Merchant, Van der Stede, & Vargas, 2004; Merchant & Manzoni, 1989). The authors also found a significant, positive relationship between past performance and difficulty of selected goal, as well as a significant, positive relationship between difficulty of selected goal and performance. Employees with more than two years of experience at the call center were more likely to choose the most difficult goal and less likely to choose the easiest goal than those with less than two years of experience. This finding, as well as the finding that only 58% of all employees met their self-selected goals, suggests that employees, especially those without extensive task experience, may not be able to judge their own ability accurately and therefore may choose a goal that is too easily attainable or unreachable.

In a laboratory study, Jeffrey, Schulz, and Webb (2012) compared the effects of a “one goal for all” approach to an ability-based approach to goal setting on performance and persistence. Based on their earlier study (Webb et al., 2010), the authors examined three levels of goal difficulty along with an increasing bonus incentive pay system. The goals were chosen based on normative data from a pilot study.

One hundred thirty-eight undergraduates performed a computerized number decoding task for five trials in one 35-minute session. The first two trials were training
trials during which participants were paid $0.05 for each number decoded. No goals were given. These data were used to classify participants as low, medium, or high ability participants. The participants were then randomly assigned to the “one goal for all” condition or the ability-based goal condition. In the “one goal for all” condition, all participants received the same goal: a difficult but achievable goal as defined in the goal setting literature. Difficult but achievable goals have been defined as those achievable by 20% to 50% of individuals (Fasteas & Hirst, 1992; Jeffrey et al., 2012; Merchant & Manzoni, 1989). The goal was set so that 20% of the participants were expected to meet it. In the ability-based goal condition, goals were set such that 20% of the participants within each ability group were expected to meet the goal. To increase the goals’ effects on performance, within-trial and post-trial feedback were given to the participants.

Because of pre-existing differences in ability among the goal groups, performance in training session 2 was used as a covariate. The adjusted means showed that lower-ability participants performed significantly higher under the ability-based approach than the “one goal for all” approach. No differences in performance were found in moderate or higher performers. Personal goals correlated with performance across all participants.

One of the limitations of using the ability-based goal approach used in Jeffrey et al. (2012) is the possibility of misclassifying employees’ ability based on current performance. Jeffrey et al. stated that in organizations, tasks are often much more complex than the experimental task used by the authors and may lead to misclassification. Similarly, Webb et al. (2010) forced employees to choose one of three goal levels. If an employee chose the most difficult goal and highest bonus pay, the employee would not earn any bonus for achieving a lower goal. If an employee chose too
conservatively for his/her ability, there was no reward for continuing to work beyond the goal. The participants in the tiered goal condition of the current study had the option to work towards the level 1, level 2, or level 3 goal during any session, thus eliminating the need for classification and the possibility of incorrect self-categorization. Additionally, if a participant reached his or her level 1 or 2 goal, there were still additional rewards available for higher levels of performance.

Another limitation of the ability-approach is perceived fairness of goals by the participants. In order to address these concerns, Jeffrey et al. (2012) did not tell participants about each other’s goals. Unfortunately, this is impossible in the workplace. A tiered goal approach would present all employees with the same goals; however, they could select whichever goal they prefer, based on ability and self-efficacy.

**Goal Setting and Performance Feedback**

It is generally accepted by both traditional I/O psychologists and behavior analysts in organizational behavior management that feedback is either necessary to improve performance or, at the very least, increases the effectiveness of goal setting (Erez, 1977; Fellner & Sulzer-Azaroff, 1984; Kim & Hamner, 1976; Klein et al., 1999, 2012). For example, Ralis and O’Brien (1987) found that suggestive selling and sales did not increase when limited feedback on goal attainment was provided, but did increase when graphic, publicly posted individual feedback and contingent praise were provided. Amigo, Smith, and Ludwig (2008) found busing time significantly decreased when feedback was added to goal setting and task clarification. Lorenzi (1988) examined goals without feedback and found no differences among vague “do your best,” easy, moderate, and difficult goals. As previously mentioned, Miller and Steele (1984) failed to find an
interaction effect between goal difficulty and incentive pay, and Lee et al. (1997) attributed these results to lack of between and within session performance feedback. Therefore, in the current study, in-session feedback was provided continuously for all participants.

Wilk and Redmon (1998) used a combination of goals, graphic and verbal feedback to increase task completion and satisfaction of 16 clerical employees in a university admissions department. In the first phase of intervention, employees received individual daily goals and verbal feedback regarding progress towards those goals twice per day. Verbal praise was given for increased performance or goal achievement. In the second phase, individual graphic feedback on task completion was added to the intervention. Results showed that tasks completed per week increased after goal setting and verbal feedback were introduced, and that individual graphic feedback produced an additional increase in task completion. Therefore, to maximize the effect of the goals in the current study, graphic and verbal feedback on the number of the correctly completed records in the previous session were provided to all participants before all sessions except the first.

**Praise and Feedback**

Results from a laboratory study conducted by Johnson (2013) compared the effects of the three types of performance feedback: evaluative, objective or objective plus evaluative on performance. Johnson’s results suggest that evaluative statements should be used in conjunction with objective performance feedback whenever possible. In the current study, objective feedback was provided throughout the sessions, as well as before sessions 2 through 6. Praise was also given when a participant improved his or her
performance from the last session or reached a goal for his or her group. If a participant in the tiered group reached the level 1 or level 2 goal, the participant was praised for reaching that goal and reminded that he or she may earn more money by achieving the next goal level. Not receiving praise in situations in which it is typically provided (particularly in a one-on-one social interaction when one’s performance is shown to be above average or improving) might actually be aversive and suppress subsequent performance (Dickinson, 1989).

**Summary and Rationale**

Traditional goal setting research has largely neglected experimental research on bonus pay and goals. Results of studies investigating the interaction between pay system and goal difficulty on performance thus far led Latham and Locke (2013) to state, “If there ever was an area begging for empirical research, the issue of goal-contingent bonuses is it” (p. 577). Further, though Locke (2004) called for experimental analyses of the tiered approach to goal setting, no research has yet been published on multiple, simultaneously available goals. This experiment extends the behavioral and traditional lines of goal setting research by examining the effect of tiered goals and attainment-contingent bonus pay on performance. The effects of tiered goals were compared to the effects of commonly researched moderate and difficult “one goal for all” approaches on performance.

Based on previous studies investigating the effects of goal difficulty and bonus pay on performance (Lee et al., 1997; Mowen et al., 1981), along with a behavioral analysis of the tiered goal approach, we predicted the adjusted group means for number of correctly completed records would support Hypothesis 1:
H1: $\mu_{Adj\ j} \neq \mu_{Adj\ k}$ for some goal groups j, k

Possible moderating variables of the relationship between goals and performance, including ability, personal goals, and goal commitment were measured performance during a “do your best” session and responses to the Knowledge and Commitment questionnaire. Based on previous research (e.g., Klein et al., 1999; Lee et al., 1997), we predicted goal commitment and personal goals would be significantly correlated with performance in Hypotheses 2 and 3:

H2: $\rho_{commitment,\ performance} \neq 0$

H3: $\rho_{personal\ goals,\ performance} \neq 0$

Jeffrey et al. (2012) found that the positive performance effects of an ability-based goal approach were stronger for low performers than high performers. This study extended those results by using a tiered goal approach over five experimental sessions. The tiered goal approach allows individuals to contact reinforcement at three levels of performance and does not require that employees be grouped by ability. Based on Jeffrey et al. (2012), we predict the data would support Hypothesis 4:

H4: There is a significant interaction effect between session number and goal type.

We predicted that persistence, measured as the difference between session 2 and session 6 performance, would be greatest for the tiered goal group.

In order to maximize the effect of goals on performance, graphic, written, and vocal, objective and evaluative feedback was provided to all participants. Praise was provided when a participant increased his or her performance over time or when he or she reached an assigned goal.
METHOD

Participants

Forty-eight Western Michigan University undergraduate students were recruited to participate in the study using posted flyers (see Appendix A) and announcements in psychology classes (see Appendix B for the script). Potential participants were screened according to four criteria. First, potential participants must have reported playing one of six specific computer games and playing computer games generally at least one hour per month (see Appendix C for the potential participant questionnaire). Computer games were provided as an analogue to the off-task activities that are available to employees in the workplace. If the computer games were not attractive to participants, they may have spent all of their time performing the experimental task because of the lack of attractive alternative activities, which may have concealed differences due to the independent variables.

Second, potential participants were excluded if they were currently or had been employed in data entry positions. Past studies have found that participants with data entry experience are significantly better at performing this task and introduce extreme variability to the dataset. Next, potential participants were excluded from the study if they had previously participated in other performance management studies using the same experimental task, or if they had taken either PSY 3440 or PSY 4440. Previous exposure to the task or to the research area may have influenced performance.

Finally, participants must have reported availability for six 50-minute sessions during a six-week period in the spring 2014 semester. Only individuals who met all of the requirements described above and who signed a consent form approved by the Western
Michigan University Human Subjects Institutional Review Board (HSIRB) were included in the study (see Appendix D for the consent form and Appendix E for a copy of the HSIRB research approval letter).

Although 48 participants were recruited to begin the experiment, four participants did not complete all experimental sessions. Three participants withdrew from the study and one participant was withdrawn by the primary researcher. Of those that withdrew, two participants reported dropping introductory psychology as the reason for their withdrawal, and one participant withdrew because of scheduling conflicts. The experimenter withdrew the final participant from the study after three consecutive missed sessions and repeated failed attempts to contact the participant. Therefore, 44 participants’ data are included in the analyses.

Of these 44 participants, 70% were female (n=31) and 30% were male (n=13). Participants ranged in age from 18 years to 31 years, with the majority (91%; n=40) falling between the ages of 18 and 21. The participants played an average of 12.8 hours of computer games per month.

All participants were paid $4.00 base pay per session, plus monetary bonuses contingent upon goal achievement. Participants received pay for all sessions during the debriefing session.

Setting

Sessions were conducted in a university laboratory (Wood Hall, 2532) with three work areas. Each work area included a desktop computer, keyboard, mouse, gel palm rest, and an adjustable chair. The work areas were separated by cubicle walls so that adjacent participants could not view each other’s screens. Cubicle walls also separated
the work areas from a general laboratory area. The experimenter used additional rooms across the hall (Wood Hall, 2510 and 2512) to greet participants before each session, to provide individualized feedback, goals, and praise, and to arrange subsequent sessions. Then the experimenter escorted participants to the general laboratory area. Participants were able to take their belongings with them to the work area. Except when greeting participants, the experimenter remained in the general laboratory area during the experimental sessions.

Apparatus

The experimental task consisted of a medical transcription data entry task, a task designed to simulate the job of a medical data entry clerk. The computer program provided participants with data corresponding to “patients.” Participants first looked for the “Patient ID number” and typed it into the correct location (the blank “PATIENT ID” box). Then, they looked at whether the patient was male or female and, based on the ranges provided for the respective gender, they determined whether the patient’s data were “within range” or “outside of range” by clicking the appropriate button. When participants were satisfied with their responses, they clicked the “submit” button to close the current patient’s record and generate the next record. Instructions were provided to participants at the beginning of each session. A screenshot of the experimental task is provided in Appendix F.

Each computer had six computer games available for play at any time: Solitaire, Bejeweled, Mahjong, Text Twist, Jewel Quest, and Angry Birds. The first five games were selected based on survey results from three introductory psychology classes and one child psychology class at Western Michigan University in the 2010 spring semester.
(n=348 students). Students were asked to pick up to five games they played most frequently from a list of the 20 most downloaded games on a popular computer game website, shockwave.com. Angry Birds was selected because it was the most downloaded paid application in iTunes in 2013. All of the games were among the most popular games in 2013 as indicated on windows.microsoft.com and apple.com/itunes/charts/. Job aids with instructions for each game were provided at each workstation.

**Dependent Variables**

The primary dependent variable was the number of correctly completed patient records. Other variables may have affected the primary dependent variable and thus were measured as secondary dependent variables: (1) time-on-task, i.e., the average number of minutes spent performing the experimental task in each session, (2) accuracy, i.e., the average percentage of patient records completed correctly per session, and (3) data entry rate, i.e., the average number of patient records completed per time-on-task per session.

The computer program automatically recorded the time-off-task, defined as pauses in responding longer than 30 seconds, and calculated time-on-task by subtracting the cumulative number of seconds off task from the total session time. The computer program also automatically recorded the data entry rate, and number of correct and incorrect patient record entries. After a participant completed a session, the experimenter copied the data from the computer to a password protected flash drive to ensure prevention of data loss. At the end of the study, the primary researcher calculated the average time spent on-task per session and the average percentage of data entry tasks completed correctly per session. A sample spreadsheet with hypothetical participant data is provided in Appendix G.
Before sessions, each participant received a receipt showing his or her performance and pay in the previous session, as well as the participant’s assigned goal(s). The participants also received graphic feedback showing their performance in relation to the assigned goal(s). After receiving the receipt and graphic feedback, but before each work session began, the participant completed the goal Knowledge and Commitment questionnaire. This questionnaire was based on the KUT scale of goal commitment (Klein et al., 2011). Participants’ answers with regard to knowledge of and commitment to the assigned goals were compared across time and between groups. This questionnaire asked participants to list their own personal goals for the upcoming session; personal goals were compared across time and between groups (see Appendices H, I, J, & K for receipts; Appendices L, M, & N for graphs, Appendices O and P for Knowledge and Commitment questionnaires).

When all sessions were complete, participants completed a questionnaire assessing their satisfaction and stress levels during the study. Answers provided by participants in each goal condition were compared to determine if the groups experienced significantly different levels of stress and/or satisfaction between groups or over time (see Appendix Q for the Stress/Satisfaction questionnaire).

**Independent Variables**

**Goal type.** Participants were randomly assigned to one of three conditions: (a) a multiple, tiered goal level condition, in which participants earned $4 base pay, plus $1 in bonus pay for achieving an easy goal (150 records), $2 for achieving a moderate goal (205 records), or $3 for achieving a difficult goal (245 records), (b) a difficult “one goal for all” condition, in which participants earned $4 in base pay and an additional $3 for
achieving the difficult goal (245 records), and (c) a moderate “one goal for all” condition, in which participants earned $4 in base pay and an additional $2 in bonus pay if they achieved the moderate goal (205 records).

Level 1, 2 and 3 goals were based on the maximum performance of one group of participants in VanStelle (2012) and Group 1 in Bechtel (2013). These participants performed the same experimental task that was used in the present study, were paid on an hourly pay system (with no bonus pay), and received experimenter-provided graphic feedback before each session. Participants in VanStelle (2012) also received the same in-session feedback as provided to the participants in the current study. The 31 participants from the two studies were combined and classified into three groups: low performers (n=10), middle performers (n=11), and high performers (n=10).

The Level 1 goal was calculated using the low performers’ data. Fifty percent of low performers (approximately 83% of all performers) were able to correctly complete 150 records at some point during the first five sessions of the study. The Level 2 goal was calculated using the middle performers’ data. Fifty percent of middle performers (50% of all performers) were able to correctly complete 205 records during the first five sessions of the study. The Level 3 goal was calculated using the high performers’ data. Fifty percent of high performers (approximately 17% of all performers) were able to correctly complete 246 records at some point during the first five sessions. These goals were rounded to the nearest five to make goals easier for the participants to remember.

**Ability.** Post hoc analyses on ability were planned a priori. It was predicted that the tiered goal system would produce the largest performance increase for low performers.
Experimental Design

A 3 (goal type) x 2 (session) mixed design was used to test the hypothesis that the tiered group correctly completed more patient records than the difficult or moderate goal groups. Factor A was a between-subjects factor with three levels: (1) moderate goal, (2) difficult goal, and (3) tiered goal. Factor B was a within-subjects factor with two sessions of interest: sessions 2 and 6 (i.e., immediately after goals were presented and at the end of the study). A 3 x 2 design was used rather than a 3 x 5 design because the important comparisons were deemed to be performance during the first experimental session (to determine the initial effects of the goals) and performance during the last experimental session (to determine the terminal effect of the goals). The 3 x 2 design also resulted in more statistical power. Performance from session 1, in which participants were only told to do their best, was used as a covariate. Participants then completed five sessions in their randomly assigned goal condition. Forty-four participants completed the experiment ($n_{\text{moderate}}=14$, $n_{\text{difficult}}=14$, and $n_{\text{tiered}}=16$).

Statistical Analyses

A 3 (goal type) x 2 (session) analysis of covariance (ANCOVA), corrected using a Hunyh-Feldt estimation of Box’s Epsilon, was planned to determine the effects of goal type and/or session on the number of correctly completed patient records (Hunyh & Feldt, 1976). However, the sample data violated the assumption of homogeneous regression slopes required for ANCOVA. The test for heterogeneous regression slopes refers to one or more significant differences among the groups’ slopes when correctly completed checks are regressed on the covariate (i.e., “do your best” performance). In other words, it was inappropriate to control for ability because the effects of goal type on
performance depended on the participant’s ability level. To examine the effects of goal type on performance at specific ability levels, a picked points analysis was conducted (Huitema, 2011).

Pearson product moment correlations were also computed to determine the strength of the relationship between the average number of correctly completed patient records and five secondary dependent variables: KUT score, personal goals, time-on-task, accuracy, and data entry rate. Analyses of variance were used to determine if participants answered the quantitatively scaled items differently depending on randomly assigned goal type. Personal goals were compared among groups using an analysis of variance.

**Procedures**

**Introductory session.** The experimenter asked potential participants to read the consent form and answered any questions they had. If interested in participating, the experimenter then asked the potential participant to sign the consent form (see Appendix D for a copy of the informed consent). Those who did not wish to participate were thanked for their time and dismissed. Each potential participant was assigned a number and then asked to complete the potential participant questionnaire. Those who met the inclusionary criteria outlined in the Participants section were asked to practice the task for 10 minutes and schedule subsequent sessions. Those who did not meet all criteria were thanked for their time and dismissed.

**Do your best session.** Participants earned $4.00 for the first 45-minute work session, regardless of group. In this session, all participants were given general instructions to do their best (see Appendix R for instructional script).
**Experimental sessions.** Participants, regardless of condition or task performance, were paid $4.00 for every 45-minute work session (50-minute total session time). They were paid in cash during the debriefing session. At the beginning of each session except the first, the experimenter escorted the participant to a private room across the hall from the main laboratory. There, he or she received a printed receipt with the number of correctly completed patient records in the previous session, as well as pay earned. Below the written feedback on the receipt, the goal(s) for the participant’s randomly assigned group was listed, along with bonus pay available for achieving each goal (see Appendices H, I, J & K for receipts). Goal-related graphic feedback on the participant’s performance was also provided and explained (see Appendices L, M, & N for graphs). After the experimenter explained the participant’s performance goal(s) and bonus pay, he or she was given a short questionnaire to assess assigned goal knowledge and commitment, as well as the participant’s personal goal (see Appendices O and P for the Knowledge and Commitment questionnaires). Participants completed this questionnaire before each experimental session to determine if participants responded differently based on goal type or differently over time. The experimenter then led the participant to the work area and reminded the participant that he or she could play computer games or relax at any time during the session.

The computer provided in-session feedback throughout the study. During the session, the computer continuously displayed (a) the total number of records completed at that point in the session, (b) the number of correctly completed records at that point in the session, and (c) the rate of record completion (number of records completed per time-on-task) at that point in the session. The number of records completed and the number
correctly completed refreshed after each record. The rate of record completion refreshed every 30 seconds.

**Debriefing**

At the end of the sixth session, participants completed the Stress/Satisfaction questionnaire in order to compare responses among goal groups and over time (see Appendix Q for questionnaire). Then, the experimenter showed the participant his or her final receipt, and paid the participant the total amount earned during the study. Next, the experimenter briefly described the different goals used in the study as well as the results’ applications to the workplace and gave the participant an opportunity to ask any questions. Finally, the experimenter thanked the participant for his or her participation.

**Integrity of the Independent Variable**

All interactions with participants were scripted and the instructions read to the participants (see Appendix R for the instructional scripts and Appendix S for the debriefing script). Research assistants were trained to conduct sessions and record data before the study began.
RESULTS

Primary Analyses

Table 1 displays the means and standard deviations for the main dependent variable, the number of correctly completed patient records, by goal type. Performance levels for three sessions were of experimental interest: session 1 (i.e., the “do your best” session used as the measure of ability), the first experimental session, and the last experimental session. The raw means for the tiered goal group are higher than the moderate or difficult goal groups for the first and last experimental sessions.

Table 1
Correctly Completed Patient Records by Goal Type and Session Type

<table>
<thead>
<tr>
<th>Session</th>
<th>Moderate</th>
<th>Difficult</th>
<th>Tiered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “Do your best” session</td>
<td>215.6</td>
<td>185.4</td>
<td>210.8</td>
</tr>
<tr>
<td>2. First experimental session</td>
<td>255.4</td>
<td>250.7</td>
<td>271.5</td>
</tr>
<tr>
<td>6. Last experimental session</td>
<td>282.6</td>
<td>264.9</td>
<td>313.75</td>
</tr>
</tbody>
</table>

\[ \mu_{Adj} \neq \mu_{Adj} \text{for some goal groups } j, k. \] A 3 x 2 ANCOVA was planned to test this hypothesis; however, the sample data violated the assumption of homogeneous regression slopes, indicating that the relative effects of the goals depended upon the covariate score. The relationships among goal type, covariate, and performance in the first and final experimental sessions are shown in Figures 1 and 2, respectively. Using the liberal alpha value .20 recommended by Huitema (2011), the results show significant
differences in slopes between moderate and difficult goals during the first experimental session, $p = .01$, and the final experimental session, $p = .16$, as well as between the moderate and tiered goal groups during the first experimental session, $p = .09$. There were no differences between the effects of difficult and tiered goals for either session of interest ($p = .70$ and $p = .45$). To further examine the effects of goal type at specific ability levels, tiered and difficult goal group data were pooled and a picked points analysis was conducted (Huijema, 2011).

Figure 1. First experimental session performance by covariate and goal type.
Figure 2. Final experimental session performance by covariate and goal type.

Picked points analysis. As shown in Figures 3 and 4, after tiered and difficult goal group data were pooled, treatment effects were estimated at three picked points of the covariate: the minimum (21), mean (208), and the maximum (337). In session 2, for participants with the lowest level of “do your best” performance (i.e., 21 correctly completed records), tiered and difficult goals produced significantly higher performance (i.e., 130.2 more records) than moderate goals, \( t(40) = 2.56, p = .01 \). For participants with the average levels of “do your best” performance (i.e., 208 correctly completed records), tiered and difficult goals also produced significantly higher performance (i.e., 34.3 more
records) than moderate goals, $t(40) = 3.04, p = .004$. For participants with the highest level of “do your best” performance, tiered and difficult goals did not produce significantly higher performance (i.e., 31.8 more records) than moderate goals, $t(40) = 1.17, p = .25$.

![Graph](image)

**Figure 3.** First experimental session performance by covariate and goal type with tiered and difficult goal data pooled.

In session 6, none of the differences in performance were significant at any of the picked points on the covariate. For the lowest and average covariate performers, the differences between moderate goals and pooled tiered and difficult goals (i.e., 125.6 and 41.5 records, respectively) approached significance, $t(40) = 1.70, p = .10$, and $t(40) = 1.79, p = .08$. For the highest level performers, the 16.5 record difference between moderate and pooled tiered and difficult goal groups was nonsignificant, $t(40) = .12, p = .72$. 
Figure 4. Final experimental session performance by covariate and goal type with tiered and difficult goal data pooled.

Goal commitment: $H_2$: $\rho_{\text{commitment, performance}} \neq 0$. The relationship between the primary dependent variable and goal commitment was statistically significant at $\alpha = .05$, $r(82) = .25, p = .02$. Table 2 displays the mean goal commitment of each group, as well as the correlations between performance and KUT score for each group. An ANOVA showed no significant differences between the goal groups on moderate or difficult goal commitment, $F(1, 26) = .22, p = .64$ and $F(1, 27) = .38, p = .54$, respectively. However, the differences among correlation coefficients were also tested. For moderate goal level commitment, those in the moderate group show a significantly higher correlation between performance and KUT score than those with a choice among goals, the tiered goal group, $Z = 2.45, p = .01$. The difference between correlation coefficients for the difficult and tiered goal groups with respect to the difficult goal was nonsignificant, $Z = 1.65, p = .10$. 
### Table 2

KUT Scores: Means, Standard Deviations, and Correlations between KUT Score and Performance, by Goal Type

<table>
<thead>
<tr>
<th>Goal Type</th>
<th>Mean</th>
<th>SD</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>4.1</td>
<td>0.8</td>
<td>0.53**</td>
</tr>
<tr>
<td>Tiered - Moderate</td>
<td>3.6</td>
<td>1.3</td>
<td>-0.43**</td>
</tr>
<tr>
<td>Difficult</td>
<td>3.9</td>
<td>1.2</td>
<td>0.77**</td>
</tr>
<tr>
<td>Tiered – Difficult</td>
<td>4.3</td>
<td>0.9</td>
<td>0.32*</td>
</tr>
</tbody>
</table>

* *p < 0.05  
** *p < 0.001

**Personal goals: H₃:** $\rho_{\text{personal goals, performance}} \neq 0$. In the first experimental session, 35 out of 44 participants (79.5%) reported specific personal performance goals. The association between personal performance goals and actual performance was statistically significant for the first experimental session, $r(34) = .61, p < .001$. In the final experimental session, 37 out of 44 participants (84.1%) reported specific performance goals. The correlation between personal performance goals and actual performance was statistically significant, $r(36) = .69, p < .0001$. A two-factor ANOVA showed no significant differences among the effects of goal type on personal goals, $F(1, 26) = 1.24, p = .30$. The personal goals also did not differ significantly by session, $F(1, 82) = 2.21, p = .14$. Table 3 displays the means of personal goals by group, as well as the correlations between performance and personal goal for each group.
Table 3

Personal Goals: Means, Standard Deviations, and Correlations between Personal Goals and Performance, by Goal Type

<table>
<thead>
<tr>
<th>Goal Type</th>
<th>Personal Goal</th>
<th>Mean</th>
<th>SD</th>
<th>$r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td></td>
<td>255.0</td>
<td>65.8</td>
<td>0.92**</td>
</tr>
<tr>
<td>Difficult</td>
<td></td>
<td>267.6</td>
<td>40.1</td>
<td>0.74**</td>
</tr>
<tr>
<td>Tiered</td>
<td></td>
<td>259.2</td>
<td>71.4</td>
<td>0.53**</td>
</tr>
</tbody>
</table>

**$p < 0.001$**

**Persistence: Change score analysis.** A two-factor ANOVA was computed on the difference between the final and first experimental sessions. Neither ability group nor goal type produced significant differences in performance, $F(2, 35) = 1.12, p = .34$, and $F(2, 35) = 1.01, p = .38$, respectively.

**Secondary Analyses**

The number of correctly completed patient records could have been affected by three secondary dependent variables: (1) time on-task, i.e., the average number of minutes spent performing the experimental task in each session, (2) accuracy, i.e., the average percentage of patient records completed correctly per session, and (3) data entry rate, i.e., the average number of patient records completed divided by time on task. Table 4 displays the means and standard deviations for these variables by goal type.
Table 4

Means and Standard Deviations for Secondary Dependent Variables, by Goal Type

<table>
<thead>
<tr>
<th>Goal Type</th>
<th>Time on Task</th>
<th>Accuracy</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Moderate</td>
<td>38.1</td>
<td>6.3</td>
<td>97.3</td>
</tr>
<tr>
<td>Difficult</td>
<td>37.8</td>
<td>10.0</td>
<td>97.3</td>
</tr>
<tr>
<td>Tiered</td>
<td>41.1</td>
<td>4.3</td>
<td>98.2</td>
</tr>
</tbody>
</table>

Table 5 displays the Pearson product-moment correlations between the number of correctly completed patient records and these variables. All correlations were positive and statistically significant using a two-tailed, .05 level of significance. Of the secondary dependent variables, rate of check completion was most highly correlated with the number of correctly completed patient records, $r = 0.90$.

**Satisfaction and Stress**

Table 6 displays the means and standard deviations for satisfaction and stress questionnaire items by group. Analyses of variance showed no statistically significant differences for stress or satisfaction levels among groups.
Table 5

Correlations between Performance and Secondary Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>Time on Task</th>
<th>Accuracy</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly Completed Patient Records</td>
<td>.67**</td>
<td>.47**</td>
<td>.90**</td>
</tr>
<tr>
<td>Time on Task</td>
<td>.24*</td>
<td>.40**</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td>.37**</td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05
**p < 0.001

Table 6

Means and Standard Deviations for Questionnaire Items

<table>
<thead>
<tr>
<th>Goal Type</th>
<th>Moderate</th>
<th>Difficult</th>
<th>Tiered</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied were you with the bonus pay system? (1=extremely dissatisfied and 7=extremely satisfied)</td>
<td>5.5 1.3</td>
<td>6.4 .93</td>
<td>6.3 1.2</td>
</tr>
<tr>
<td>How stressful did you find the bonus pay system? (1=extremely stressful and 7=not at all stressful)</td>
<td>4.5 .52</td>
<td>4.4 .77</td>
<td>4.5 .64</td>
</tr>
</tbody>
</table>
DISCUSSION

The primary purpose of this study was to examine the relative effects of tiered goals, difficult goals, and moderate goals on performance when individuals earn goal-contingent bonus pay. To the author’s knowledge, this was the first study to compare the relative effects of concurrently available tiered and traditional “one goal for all” goals. The results of the homogeneity of regression slopes test yielded a significant result, meaning that the effects of the goal types on performance depended on the ability of the participant. There were no significant differences between tiered and difficult goal groups; therefore, the primary hypothesis was not supported. Personal goals and goal commitment were significantly associated with the number of correctly completed patient records, supporting H₂ and H₃.

Goal Specificity

Regardless of type, specific goals increased performance over “do your best” goals. Performers in the moderate goal, difficult goal, and tiered goal groups correctly completed an average of 39.8, 65.3, and 60.7 more patient records during their first experimental session than in their “do your best” session, respectively. Although the differences among these groups were not significant, the positive change scores are consistent with a major conclusion of goal setting theory, that specific, difficult goals increase performance over “do your best” goals.

Goal Difficulty

Locke and Latham (1979) first theorized a positive, linear association between goal difficulty and performance; that is, the more difficult the goal, the higher the performance. However, other studies have shown that moderate goals (Lee et al., 1997)
or easy goals (Mowen et al., 1981) are most effective when individuals earn goal-contingent bonuses. For low and average performers, tiered and difficult goals initially produced significantly higher performance than moderate goals, consistent with Locke and Latham (1979). However, for high performers in the first experimental session, and for all performers in the final experimental session, there were no significant differences in performance levels among goal groups.

Jeffrey et al. (2012) also found a significant interaction between goal type and ability level. Specifically, the authors found that ability-based goals were most effective for low performers over two experimental sessions. The results of this study showed that although there were significant differences among goal types for low and moderate performers in the first experimental session, the differences in performance were nonsignificant during the sixth session.

It is important to note that participants in this experiment performed at much higher levels than those in the hourly pay experiments on which these goals were set (i.e., Bechtel, 2013; VanStelle, 2012). Based on the results of these studies, the difficult goal was set at a 245 correctly completed records, a .17 expected probability. However, in the present study, 14 of 44 participants (.31) correctly completed 245 or more records during the “do your best” goal session. When specific goals and goal-contingent were given in the first experimental session, 29 of 44 participants (.66) reached or exceeded the difficult goal. In the final experimental session, 37 of 44 participants (.84) reached or exceeded the difficult goal, including 27 of 30 participants in the tiered and difficult goal groups (.90). Based on these results and defining a challenging yet attainable goal as achievable by 20% to 50% of employees, the difficult goal was not nearly challenging enough to
produce maximum performance in this sample (Fasteas & Hirst, 1992; Merchant & Manzoni, 1989).

These goal achievement rates differed drastically than the expected probabilities, as well as the goal achievement rates found in Jeffrey et al. (2012). Jeffrey et al. set their highest goal level using a .20 expected probability from pilot study data. In the last experimental session, 16 out of 91 participants who received the most difficult goal reached or exceeded the goal (.18). In the current study, 37 of 44 participants (.84) reached or exceeded the most difficult goal in the final experimental session. Rather than easy, moderate, and difficult, the goals in the current study might be more appropriately labeled extremely easy, very easy, and easy. Using these classifications, the current study showed that tiered goals and easy goals were more effective than very easy or extremely easy goals for low and moderate performers in the first experimental session. In the final experimental session, there were no differences in performance levels among the extremely easy, very easy, or tiered groups. It is likely that performance would increase if additional rewards were available for higher performance levels.

**Goal Commitment and Personal Goals**

Possible moderating factors of the goal-performance relationship, goal commitment and personal goals, were measured and as hypothesized, their respective overall correlations with performance were significant. Analyses showed no significant differences between the goal groups on moderate or difficult goal commitment; however, there were effects of goal type on the commitment-performance relationship. For those in the tiered goal group, the correlation between performance and moderate goal commitment was significant and negative. When participants were given concurrently
available tiered goals, those who committed more to the moderate goal performed at significantly lower levels than those who are less committed to the moderate goal. These results suggest that although concurrently available, participants in the tiered goal group rejected lower goals in favor of commitment to the difficult goal. Commitment to a particular goal is affected by the other choices available.

There were no differences in personal performance goals by goal type. Similar to the results of Jeffrey et al. (2012), personal goals were very highly correlated with performance across all goal groups. The linear relationship between personal goals and performance was higher than the assigned goal-performance relationship and the commitment-performance relationship. Out of the 37 participants who reached the difficult goal in the final experimental session, only one participant stopped at 245 correctly completed records. Although there were no additional rewards available for completing more than 245 records, the top-performing participant set and reached his personal goal of 500 correctly completed records in the final experimental session. These results are similar to those found in Mowen et al., another laboratory study, in which the very easy goal and bonus pay condition average performance was 165% of the goal level.

Employees have more attractive alternative activities to engage in the workplace than in the lab. In the workplace, employees have multiple tasks to complete during the workday. If no additional reinforcement is provided for outperforming the goal at least occasionally, performance above the highest assigned goal and private, personal goals for a particular task will likely decrease over time.
Secondary Dependent Variables

With respect to the secondary dependent variables, the relationship between the number of correctly completed patient records and accuracy, time on task, and rate were significant. The most highly correlated secondary dependent variable with the number of correctly completed checks was rate of check completion. This is consistent with results reported by VanStelle (2012), McGee, Dickinson, Huitema, and Culig (2006) and Johnson (2005).

In order to examine satisfaction and stress among groups, analyses of variance were conducted on satisfaction and stress questionnaire items. There were no statistically significant differences among the groups for these measures. Participants in all goal groups chose the “completely satisfied” option most frequently. In the moderate group, the most frequently chosen stress rating for the bonus pay system was “a little stressful;” in the tiered and difficult groups, participants rated the bonus pay system “not at all stressful” most frequently.

Summary of Results

Collectively, these results stress the importance of accurately gauging employees’ ability levels before designing goal-contingent bonus pay systems. The discrepancy between the expected and actual goal achievement rates was drastic. Even though there were no statistically significant differences among the tiered and difficult goal groups with respect to performance, satisfaction, or stress after five 45-minute sessions, true differences among the goals’ effects could well have been obscured by the ceiling effects produced by low difficulty goals.
Strengths of the Study

The current study used a combination of methods and measures from I/O psychology and OBM. The experimental design and laboratory setting allowed us to isolate the effects of the goals by holding other feedback and praise constant. To the author’s knowledge, the current study was the first to experimentally evaluate tiered goals.

The experiment also included five 45-minute sessions, and found that differences among goal groups decreased as the study continued. This is an extremely long within-subjects factor when compared to other experimental evaluations of goals. For example, Jeffrey et al. (2012) found that low and average performers performed at higher levels when an ability-based goal was presented. However, participants spent a total of 15 minutes in the goal condition. Similarly, in a 60-minute experiment, Tammemagi et al. (2013) found that persistence over time varied by participant and suggested a longer within-subjects factor to examine persistence of goal-directed behavior. The results of this study show that the relative effects of goals of different difficulty levels may decrease over time.

The results of the picked points analysis in the current study, as well as the results of Jeffrey et al. (2012) suggest that performance management interventions may affect high, middle, and low performers differently. These types of analyses are rarely conducted in the experimental analyses or applied studies of OBM.

Weaknesses of the Study

Considering that 84% of all participants reached or exceeded the difficult performance goal at some point during the study, it is not surprising the relative effects of
the goals were significant for low and average performers, and only at the beginning of the study. According to Daniels (2009), “... the best mistake in setting a goal is to set it too low. By setting it low you increase the probability of success. By rewarding goal attainment you increase motivation and achieve subsequent goals” (p. 41). From this perspective, this is the best weakness we could hope for. However, it is likely that the relatively low goals produced a ceiling effect in the results.

**Future Research**

Future research should base goals off the ability levels of the employees or participants involved in the study. To accomplish this, future researchers would set expected probabilities before data collection and collect a “do your best” measure of performance from all participants before determining which performance levels correspond to each tier. A measure of effect of switching from a “do your best” goal to a specific, defined goal could be estimated and used in the calculations of appropriate goal levels. In addition to, or instead of, a more complicated goal setting approach, future researchers should use performance levels from studies using the same conditions or they could simply add additional stretch goal tiers to avoid a similar ceiling effect.

Future research should also continue to focus on systematic comparisons of different types of goals. As previously indicated, goal setting is widely used as an intervention in OBM, and but it could benefit from experimental analysis with repeated sessions over time. Because personal goals were more highly correlated with performance than assigned goals or goal commitment, future research may focus on interventions designed to increase personal goals. By continuing to build on the results of
the current study, researchers and practitioners will gain more information on the most effective uses of goals in organizations.
REFERENCES


Johnson, D. A. (2005). The effects of hourly pay and individual monetary incentive pay with and without feedback (Master's thesis). Western Michigan University, Kalamazoo, MI.


VanStelle, S. E. (2012). *Performance on a data entry task when participants receive three different types of graphic feedback.* (Unpublished doctoral dissertation). Western Michigan University, Kalamazoo, MI.


Appendix A

Recruitment Poster
Research Participants Needed

Would you like an opportunity to participate in research and earn money throughout the semester?

I am looking for individuals to participate in a study designed to determine how well individuals perform a data entry task when they are paid base salary plus performance-based bonuses. The data entry task is a simple, computer-based task that requires someone to read and enter numbers using a computer’s numeric keypad. Several computer games will be available for use during the sessions as well.

Inclusionary criteria:
- You must play computer games at least one hour per month
- You must not be or have been employed in a data entry position
- You must not have previously participated in other performance management studies conducted in Dr. Dickinson’s, Dr. McGee’s, or Dr. Johnson’s lab
- You must not have taken either Organizational Psychology (PSY 3440) or Industrial/Organizational Psychology (PSY 4440).
- You must be available for six 50-minute sessions throughout the spring 2014 semester

Session pay:
- You will earn $4.00-$7.00 per 50-minute session; $24.00-$39.00 for the entire study

Where:
- Wood Hall

Interested in learning more?
- Please contact Jessica Urschel by email at j7urschel@wmich.edu

ALL INFORMATION WILL BE CONFIDENTIAL!
Appendix B

Recruitment Script
Hello. My name is Jessica Urschel. I am a graduate student in psychology and I am looking for participants for my dissertation. This project studies how individuals perform a data entry task when they are paid hourly wages plus monetary bonuses.

The data entry task is a simple, computer-based task that requires someone to read and enter numbers using a computer’s numeric keypad. Several computer games will be available for use during the sessions as well. The sessions will be held on campus in Wood Hall and will be 50 minutes long, 45 of which will be working on the data entry task. There will be 6 sessions during the semester. You will earn between $24-39 if you complete the entire study.

In order to participate, you must not have participated in other studies with the same experimental task, must not have taken Organizational Psychology (PSY 3440) or I/O Psychology (PSY 4440). You must also play computer games at least one hour per month, and be available for 6 sessions throughout the spring 2014 semester. You may schedule two sessions a day as long as you take an hour break between sessions.

Your participation is voluntary and you may withdraw from the study at any time. If you do choose to withdraw, you will be paid for your participation up to the point of withdrawal. Your participation, lack thereof, or withdrawal from the study will not affect your grade in this class or any other. Your identity and your performance in this study will be kept confidential.

If you are interested in participating and you would like further information about this study, please print your name, phone number, email address, and best times to reach you on a piece of paper and give it to me. I am also passing out a piece of paper with my information so that you may contact me if you prefer.

Thank you for your time and for any of you who choose to participate, thank you in advance for your help with my dissertation!
Appendix C

Potential Participant Questionnaire
**Participant # _____**

1. **Sex:**
   - Male
   - Female

2. **Age:**

3. Have you ever participated in a psychology study at WMU before?  
   - Yes
   - No
   
   If yes, did you perform a medical data entry task?*  
   - Yes
   - No
   
   *A screenshot of this task is available if you’re not sure.

4. Have you taken, or are you currently taking, either of the following classes?
   - PSY 3440, Organizational Psychology  
     - Yes
     - No
   - PSY 4440, Industrial/Organizational Psychology  
     - Yes
     - No

5. Do you play the following computer games?
   - **Solitaire**
     - Yes
     - No
   - **Bejeweled**
     - Yes
     - No
   - **Jewel Quest**
     - Yes
     - No
   - **Mahjong**
     - Yes
     - No
   - **Text Twist**
     - Yes
     - No
   - **Angry Birds**
     - Yes
     - No

6. On average, how many hours per month do you play computer games? _______
Appendix D

Consent Form
Western Michigan University  
Department of Psychology  

Principal Investigator: Alyce M. Dickinson, Ph.D.  
Student Investigator: Jessica Urschel  
Title of Study: Performance on a Medical Data Entry Task When Participants are Paid Hourly Wages Plus Bonuses  

You have been invited to participate in a research project titled “Performance on a Medical Data Entry Task When Participants are Paid Hourly Wages Plus Bonuses.” This project will serve as Jessica Urschel’s dissertation under the supervision of Alyce Dickinson, Ph.D.

This consent document will explain the purpose of this research project and will go over the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

What are we trying to find out in this study?  
This study aims to gather information about individuals’ performance levels on a computerized data entry task while they are earning base pay plus monetary bonuses.

Who can participate in this study?  
We are recruiting college students enrolled in courses at Western Michigan University. There are five criteria you must meet to participate. You must play computer games at least one hour per month. You must not be or have been employed in a data entry position. You must not have previously participated in other performance management studies conducted with the same experimental task. You must not have taken either Organizational Psychology (PSY 3440) or Industrial/Organizational Psychology (PSY 4440). Finally, you must be available for six 50-minute sessions during the spring 2014 semester.

Where will this study take place?  
You will work in Wood Hall, Room 2532, which is Dr. Dickinson’s research laboratory.

What is the time commitment for participating in this study?  
You must be available for six 50-minute sessions throughout the semester.

What will you be asked to do if you choose to participate in this study?  
You will be asked to perform a computer-based medical data entry task, a task designed to simulate the job of a medical transcriptionist. The computer program will provide data corresponding to “patients.” You will first look for the “Patient ID number” and type it into the correct location. Then, you will look at whether the patient is male or female and based on the ranges provided for the respective gender, you will determine whether the patient’s data is “within range” or “outside of range” by clicking the appropriate button. After your last experimental session, you will be asked to answer questions about your
experiences during the study. Following that, your performance during the study will be reviewed and any questions you have about the study will be answered.

What information is being measured during the study?
The computer will automatically take measures of your performance on the medical data entry task. Also, at the end of the study, you will be asked to indicate your satisfaction with the procedures in the study and to indicate whether you felt more stress at one point in time versus another. You will also be asked to explain any motivation strategies you used during the study.

What are the risks of participating in this study and how will these risks be minimized?
You may experience some minor physical discomfort, minor fatigue, or minor stress when you are performing the task. These risks will be minimized by the fact that you will be able to take breaks whenever you want during the session. During these breaks, you may choose to play one of several computer games or just relax.

What are the benefits of participating in this study?
You will be contributing to the field of research on pay and performance. You may also learn about this research through participation in the study. This study will add to our understanding of how working conditions affect performance, satisfaction and stress. The findings from laboratory studies such as this can be applied in the workplace.

Are there any costs associated with participating in this study?
Besides the relatively large time commitment, there are no costs associated with participation in this study.

Is there any compensation for participating in this study?
For each 50-minute session including the training session, you will earn between $4.00 and $7.00, depending on the group you are assigned to and your performance. You will be paid in cash at the debriefing session. If you decide to withdraw from this study, you will be paid for your performance up to the point of withdrawal.

Who will have access to the information collected during this study?
The principal investigator, the student investigator, and the research assistants will have access to the information collected during this study. When you begin the study, you will be assigned a number so that your individual progress can be tracked while your identity is held strictly confidential. When the data of the study are presented or published, only your participant number will be used to identify you. Neither your name nor any identifying characteristics will be used.

What if you want to stop participating in this study?
You can choose to stop participating in the study at any time for any reason, without penalty. The investigator can also decide to stop your participation in the study without your consent. If you do not finish the study, you will be paid for your participation up to the point of withdrawal.
If you have any questions before or during the study, you may email Jessica Urschel at j7urschel@wmich.edu. You may also contact the primary investigator, Dr. Alyce Dickinson at 269-387-4473, the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

___________________________________  _____________________
Please Print Your Name

___________________________________  _____________________
Participant’s signature  Date
Appendix E

HSIRB Research Approval Letter
Date: January 28, 2014

To: Alyce Dickinson, Principal Investigator
   Jessica Urschel, Student Investigator for dissertation
   Student Investigators: Bethany Anderson, Amber Derthick,
   Jordan Frontiero, Quan Zhang

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 13-12-18

This letter will serve as confirmation that the change to your research project titled “The Effects of Tiered Goals and Bonus Pay on Performance” requested in your memo received January 28, 2014 (to add student investigators Bethany Anderson, Amber Derthick, Jordan Frontiero and Quan Zhang) has been approved by the Human Subjects Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western Michigan University.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: January 10, 2015
Appendix F

Medical Task Screenshot
Appendix G

Hypothetical Spreadsheet for Participant 1
<table>
<thead>
<tr>
<th>Phase</th>
<th>Session</th>
<th># correct records</th>
<th>Accuracy</th>
<th>Time on task</th>
<th>Records/minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO YOUR BEST</td>
<td>1</td>
<td>232</td>
<td>97.2</td>
<td>28.5</td>
<td>7.73</td>
</tr>
<tr>
<td>GOAL</td>
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<td>257</td>
<td>96.7</td>
<td>27.5</td>
<td>7.90</td>
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<tr>
<td>GOAL</td>
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<td>256</td>
<td>98.9</td>
<td>29.0</td>
<td>8.53</td>
</tr>
<tr>
<td>GOAL</td>
<td>4</td>
<td>245</td>
<td>99.3</td>
<td>27.0</td>
<td>8.17</td>
</tr>
<tr>
<td>GOAL</td>
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<td>222</td>
<td>99.1</td>
<td>25.0</td>
<td>7.40</td>
</tr>
<tr>
<td>GOAL</td>
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<td>228</td>
<td>100</td>
<td>28.5</td>
<td>7.6</td>
</tr>
</tbody>
</table>
Appendix H

Receipt – Moderate and Difficult Goal Groups

Session 2
Participant #  _____

Session #  _____

Number of correctly completed patient records in last session:  ________

Pay for last session:  $4.00

**GOAL FOR REMAINING SESSIONS:**

Correctly complete ________ records to earn $ ______ bonus! ($ ______ total)
Appendix I

Receipt – Moderate and Difficult Goal Groups

Sessions 3-6
Participant #  _____

Session #  _____

Number of correctly completed patient records in last session:  _________

Pay for last session:  $4.00  +  $  _______  bonus =  $  _______

GOAL FOR THE REMAINING SESSIONS:

Correctly complete  ________  records to earn  $  ______  bonus!  ($  ______  total)
Appendix J

Receipt – Tiered Goal Group

Session 2
Participant #   _____

Session #   _____

Number of correctly completed patient records in last session:   __________

Pay for last session:   $4.00

GOALS FOR THE REMAINING SESSIONS:

Level 1: Correctly complete 150 records to earn $1 bonus! ($5.00 total)

Level 2: Correctly complete 205 records to earn $2 bonus! ($6.00 total)

Level 3: Correctly complete 245 records to earn $3 bonus! ($7.00 total)
Appendix K

Receipt – Tiered Goal Group

Sessions 3-6
Participant #   _____
Session #    _____

Number of correctly completed patient records in last session: __________

Pay for last session: $4.00 + $ _____ bonus = $ _______

**GOALS FOR THE REMAINING SESSIONS:**

**Level 1:** Correctly complete 150 records to earn $1 bonus! ($5.00 total)

**Level 2:** Correctly complete 205 records to earn $2 bonus! ($6.00 total)

**Level 3:** Correctly complete 245 records to earn $3 bonus! ($7.00 total)
Appendix L

Graphic Feedback – Moderate Goal Group
Goal = 205
$2 bonus
Appendix M

Graphic Feedback – Difficult Goal Group
Goal = 245
$3 bonus
Appendix N

Graphic Feedback – Tiered Goal Group
Session | Number of correctly completed records | Level 3 = 245 | $3 bonus
|----------------|----------------|----------------|
| 1              |                | Level 2 = 205  | $2 bonus
| 2              |                | Level 1 = 150  | $1 bonus
| 3              |                |                |
| 4              |                |                |
| 5              |                |                |
| 6              |                |                |

Participants #
Appendix O

Knowledge and Commitment Questionnaire – Moderate and Difficult Goal Groups
1. What is your assigned goal?
   Correctly complete ________ records to earn $ ______ bonus!

2. How committed are you to this goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

3. To what extent do you care about this goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely
4. How dedicated are you to this goal?
   _____ Not at all
   _____ Slightly
   _____ Moderately
   _____ Quite a bit
   _____ Extremely

5. To what extent have you chosen to be committed to this goal?
   _____ Not at all
   _____ Slightly
   _____ Moderately
   _____ Quite a bit
   _____ Extremely

6. Do you have a personal performance goal for this session?  
   Yes  No

   If yes, please fill in the following statement:

7. My personal goal is to correctly complete ____________ patient records during this session.
Appendix P

Knowledge and Commitment Questionnaire – Tiered Goal Group
1. What are your assigned goals for this session?

   Level 1: Correctly complete _________ records to earn $_______ bonus!

   Level 2: Correctly complete _________ records to earn $_______ bonus!

   Level 3: Correctly complete _________ records to earn $_______ bonus!

For questions 2-5, think about the Level 1 goal only.

2. How committed are you to the Level 1 goal?

   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

3. To what extent do you care about the Level 1 goal?

   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely
4. How dedicated are you to the Level 1 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

5. To what extent have you chosen to be committed to the Level 1 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

For questions 6-9, think about the Level 2 goal only.

6. How committed are you to the Level 2 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely
7. To what extent do you care about the Level 2 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

8. How dedicated are you to the Level 2 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

9. To what extent have you chosen to be committed to the Level 2 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely
For questions 10-13, think about the Level 3 goal only.

10. How committed are you to the Level 3 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

11. To what extent do you care about the Level 3 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely

12. How dedicated are you to the Level 3 goal?
   ____ Not at all
   ____ Slightly
   ____ Moderately
   ____ Quite a bit
   ____ Extremely
13. To what extent have you chosen to be committed to the Level 3 goal?

____ Not at all
____ Slightly
____ Moderately
____ Quite a bit
____ Extremely

14. Do you have a personal performance goal for today’s session?

Yes    No

If yes, please fill in the following statement:

15. My personal goal is to correctly complete ____________ patient records during this session.
Appendix Q

Stress/Satisfaction Questionnaire
Participant #   ____

1. How satisfied were you with the bonus pay system?
   ___ Completely satisfied
   ___ Mostly satisfied
   ___ Somewhat satisfied
   ___ Neither satisfied or dissatisfied
   ___ Somewhat dissatisfied
   ___ Mostly dissatisfied
   ___ Completely dissatisfied

2. How stressful did you find the bonus pay system?
   ___ Not at all stressful
   ___ A little stressful
   ___ Somewhat stressful
   ___ Very Stressful
   ___ Extremely stressful
Appendix R

Instructional Scripts
TRAINING SESSION (ALL GROUPS)

After informed consent is signed and group is assigned, the participant will practice the task for 10 minutes. Take the participant into the lab, and explain the task to him/her. Point out the various parts of the task as you are explaining them:

“If you have a cell phone, please silence it now and before all sessions. Before you begin the study, we’d like you to get comfortable with the task, which is designed to simulate the job of a medical data entry clerk. The computer program will provide you with data corresponding to patients. You should first look for the “Patient ID number” and type it into the correct location (the blank “PATIENT ID” box). Then, look at whether the patient is male or female and, based on the ranges provided for the respective gender, determine whether the patient’s data are “within range” or “outside of range” by clicking the appropriate button. When you are satisfied with your response, click the “submit” button to close the current patient’s record and generate the next record. Let’s try one.”

Have the participant complete a record. Ask if there any questions about the task. If so, answer questions.

“The computer will keep a running total of the number of completed and correctly completed records. You can check your progress at any time. Each computer also has 6 computer games available for play at any time: Solitaire, Bejeweled, Mahjong, Text Twist, Jewel Quest, and Angry Birds. You are welcome to play these games at any time during the sessions, or just take a break and relax. Today, we’d like you to practice the task for 10 minutes. I will come back after 10 minutes to turn off the task and schedule your sessions.”

Return after 10 minutes. Record these data on the participant’s spreadsheet. Schedule subsequent sessions with the participant in the room used for greeting.

SESSION 1 (ALL GROUPS)

After informed consent is signed and group is assigned:

“If you have a cell phone, please silence it during the session. During this 45 minute session, do your best to correctly complete as many records as you can. Remember you can always see how many records you have completed correctly. You may take a break whenever you like for as long as you like. You may play one of the computer games as a break, or you may also just stretch and relax. After I start the check task, I will be available on the other side of the cubicle wall. If you need anything during the session, I will be behind the partition. Just come get me. Do you have any questions?”
Answer any participant questions. Set the timer for 45 minutes and start the task. After 45 minutes, return and stop the task program. Record values on the participant’s spreadsheet and schedule any subsequent sessions with the participant in the room used for greeting.

**SESSION 2 (MODERATE GOAL GROUP)**
Before the session begins (in the room used for greeting):

“I have a receipt showing your performance during the last session. In your last session, you correctly completed ____ records. You earned $4.00 in base pay for the initial session. In the remaining sessions, you will still earn $4.00 in base pay, but you will also have an opportunity to earn bonus pay based on your performance. Here’s a graph showing your performance from the first session.”

Show the participant his/her graph.

“Session number is marked along the X axis and the number of correctly completed records is marked along the Y axis. You can see there is a goal line on the graph as well. If you correctly complete 205 records, you will earn $4 in base pay PLUS $2 bonus: $6.00 total for the session. If you do not reach 205 records, you will earn $4.00 for the session. Do you have any questions about the graph, the goals, or your pay for the remaining sessions?”

Answer any participant questions.

“To ensure you understand the goals and pay structure, you’ll take a short questionnaire before you begin the session.”

Give the participant the Knowledge and Commitment Questionnaire. After the participant has finished the questionnaire, show the participant to the work area.

“If you have a cell phone, please silence it during the session. Remember you can always see how many records you have completed correctly. Please remember that you can take a break from the task at any time. You can play the computer games or just sit and relax for as long as you want to. I will be behind the partitions if you need me. I will come to your work area after 45 minutes to end the session. Then we’ll confirm your next session. Do you have any questions?”

Answer any participant questions. Set the timer for 45 minutes and start the task. After 45 minutes, return and stop the task program. Record values on the participant’s spreadsheet and schedule any subsequent sessions with the participant in the room used for greeting.

**SESSION 2 (DIFFICULT GOAL GROUP)**
Before the session begins (in the room used for greeting):
“I have a receipt showing your performance during the last session. In your last session, you correctly completed ____ records. You earned $4.00 in base pay for the initial session. In the remaining sessions, you will still earn $4.00 in base pay, but you will also have an opportunity to earn bonus pay based on your performance. Here’s a graph showing your performance from the first session.”

Show the participant his/her graph.

“Session numbers are marked along the X axis and the number of correctly completed records is marked along the Y axis. You can see there is a goal line on the graph as well. If you correctly complete 245 records, you will earn $4 in base pay PLUS $3 in bonus pay: $7.00 total, for the session. If you do not reach 245 records, you will earn $4.00 for the session. Do you have any questions about the graph, the goals, or your pay for the remaining sessions?”

Answer any participant questions.

“To ensure you understand the goals and pay structure, you’ll take a short questionnaire before you begin the session.”

Give the participant the Knowledge and Commitment Questionnaire. After the participant has finished the questionnaire, show the participant to the work area.

“If you have a cell phone, please silence it during the session. Remember you can always see how many records you have completed correctly. Please remember that you can take a break from the task at any time. You can play the computer games or just sit and relax for as long as you want to. I will be behind the partitions if you need me. I will come to your work area after 45 minutes to end the session. Then we’ll confirm your next session. Do you have any questions?”

Answer any participant questions. Set the timer for 45 minutes and start the task. After 45 minutes, return and stop the task program. Record values on the participant’s spreadsheet and schedule any subsequent sessions with the participant in the room used for greeting.

SESSION 2 (TIERED GOAL GROUP)

Before the session begins (in the room used for greeting):

“I have a receipt showing your performance during the last session. In your last session, you correctly completed ____ records. You earned $4.00 in base pay for the initial session. In the remaining sessions, you will still earn $4.00 in base pay, but you will also have an opportunity to earn bonus pay based on your performance. Here’s a graph showing your performance from the first session.”
Show the participant his/her graph.

“Session numbers are marked along the X axis and the number of correctly completed records is marked along the Y axis. You can see there are three goal lines on the graph as well. The Level 1 goal is to complete 150 records during the 45 minute work session. If you correctly complete 150 records, you will earn $1 in bonus pay, $5.00 total for the session. If you reach the Level 2 goal by correctly completing 205 records, you will earn $2 in bonus pay, $6.00 total. If you reach the Level 3 goal by correctly completing 245 records, you will earn $3 in bonus pay, $7.00 total for the session. Do you have any questions about the graph, the goals, or your pay for the remaining sessions?”

Answer any participant questions.

“To ensure you understand the goals and pay structure, you’ll take a short questionnaire before you begin the session.”

Give the participant the Knowledge and Commitment Questionnaire. After the participant has finished the questionnaire, show the participant to the work area.

“If you have a cell phone, please silence it during the session. Remember you can always see how many records you have completed correctly. Please remember that you can take a break from the task at any time. You can play the computer games or just sit and relax for as long as you want to. I will be behind the partitions if you need me. I will come to your work area after 45 minutes to end the session. Then we’ll confirm your next session. Do you have any questions?”

Answer any participant questions. Set the timer for 45 minutes and start the task. After 45 minutes, return and stop the task program. Record values on the participant’s spreadsheet and schedule any subsequent sessions with the participant in the room used for greeting.

**SESSIONS 3-6 (ALL GROUPS)**

Before each session begins (in the room used for greeting):

“I have a receipt showing your performance during the last session. In your last session, you correctly completed ____ records. You earned $4.00 in base salary and $$____ in bonus pay. So you earned $____ total for the last session.”

Please add a comment on their performance at this time if the participant improved his or her performance or achieved a goal. A list of possible comments can be found at the end of this script. Please do not use the same comment every time.
“To ensure you understand the goals and pay structure, you’ll take a short questionnaire before you begin the session.”

Give the participant the Knowledge and Commitment Questionnaire. After the participant has finished the questionnaire, show the participant to the work area.

“If you have a cell phone, please silence it during the session. Remember you can always see how many records you have completed correctly. Please remember that you can take a break from the task at any time. You can play the computer games or just sit and relax for as long as you want to. I will be behind the partitions if you need me. I will come to your work area after 45 minutes to end the session. Then we’ll confirm your next session.”

Examples of comments on performance when participant has improved his or her performance:

"You improved your performance from last time. Good job. Now you are closer to the level _ goal and earning $_ bonus pay."

Examples of comments on performance when participant has reached level 3 goal in tiered goal group or moderate/difficult goals in ‘one goal’ groups:

“You reached the [Level 3] goal” then “Good work,” “Nice job,” “Cool,” or “Sweet” (or other equivalent, appropriate praise).

Examples of comments on performance when participant has reached level 1 or 2 goal in the tiered goal group:

“You reached the Level 1 (or 2) goal” then “Good work,” “Nice job,” “Cool,” or “Sweet” (or other equivalent, appropriate praise). “Remember, you can earn even more money if you reach the level 2 (or 3) goal.”
Appendix S

Debriefing Script
“Now that you have completed the study, there is one more questionnaire for you to fill out. It asks for your opinions about the phases and any strategies or goals you used. There are no incorrect answers to this questionnaire, but your thoughtful feedback is very important.”

Give participant the Stress/Satisfaction questionnaire.

“Thank you for participating in this study. Before I explain the purpose of the study, let me give you your final receipt and pay. You completed 6 sessions and earned $ ____.

Give the participant receipt for 6th session. Pay the participant for the entire study.

Now, let me explain the purpose of this study. This study is investigating the effects of different types of goals on performance when individuals are paid bonuses. We are examining the effects of 3 types of goals, moderate difficulty, high difficulty, or multiple, tiered goals, on your performance. We will also determine stress levels and goal strategies from your questionnaire answers. The data we obtain from this study may help businesses implement the most effective type of goals for their employees. Does everything I said make sense? Do you have any questions? (If yes, answer questions.) Here’s how you performed during the study.

Show the participant his or her graph.

Do you have any questions about your performance during the study?

Again, thank you for your participation. I really appreciate your continued participation throughout the semester. I ask that you please do not discuss this study with anyone because we have not yet finished collecting data.