The Linear Relationship Between the Difficulty Level Connotated by a Primed Goal and Task Performance

by

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Abstract

A laboratory experiment was conducted to determine whether the linear relationship between goal difficulty and performance exists in the domain of subconscious goals. Specifically, the effect of primed goals that connote three levels of difficulty on subsequent performance was examined. Participants ($n=122$) were randomly assigned to one of four conditions where they were either primed with a photograph of a person lifting 20 pounds (easy goal), 200 pounds (moderately difficult goal), 400 pounds (difficult goal), or were not primed (control condition). Participants were asked to press as hard as they could on a digital weight scale. Participants who were primed with the difficult goal of a photograph of a person lifting 400 pounds pressed significantly harder on the scale than those who were primed with the easy goal of a photograph of a person lifting 20 pounds, the moderate goal of 200 pounds, and those who were not primed. The results of this study are discussed in terms of their theoretical and practical significance.
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Chapter 1
Introduction

In this chapter, an overview of the author’s research is presented. Chapter 2 reviews the literature underlying the hypothesis that was tested. Chapter 3 explains the methodology for testing the hypothesis. Chapter 4 presents the results. The discussion of the results is in Chapter 5.

Goal Setting Theory

Goal setting theory (Locke & Latham, 1990, 2002, 2013) has been studied extensively in the field of human resource management (HRM). Four decades of empirical research has demonstrated that goal setting theory is one of, if not the most, valid and practical theory of motivation in the workplace (Miner, 2003; Mitchell & Daniels, 2003; Pinder, 1998). The theory is based on more than 1000 studies conducted in eight countries, on 88 different tasks in both laboratory and field settings for time spans ranging from one minute to 25 years where goals were assigned to individuals, set by the individual, or set participatively by the individual and a manager (Locke & Latham, 1990; Mitchell & Daniels, 2003). The theory states that individuals who consciously set specific, difficult goals perform better than those who set an easy goal, no goal, or those who are simply encouraged to do their best. In short, there is a linear relationship between the difficulty level of a goal and subsequent performance. A goal is defined as what an individual or team is trying to accomplish; it is the object or aim of an action (Locke, Shaw, Saari, & Latham, 1981).

Given that goal setting theory is one of the most pervasive theories in HRM (Latham,
1983; Latham & Arshoff, 2013), researchers have conducted studies to explain the goal-performance relationship and to test under what conditions the relationship exists. Through this research, scholars have identified the mediators and moderators of the goal-performance relationship.

**Mediators**

Four mediators explain the goal-performance relationship. One mediator is goal choice namely, direction or attention (e.g., Bagozzi & Warshaw, 1990). Goal specificity focuses an individual to work in a certain direction. A second mediator is effort (e.g., Hinsz & Ployhart, 1998). A goal regulates an individual’s effort so that it is proportionate to the difficulty of the goal. A third mediator is persistence (e.g., Bavelas & Lee, 1978). Setting a specific, challenging goal causes an individual to work longer and harder at a task. A fourth mediator is planning and strategizing (e.g., Durham, Knight, & Locke, 1997). Engaging in goal setting results in an individual planning and strategizing ways to attain their goal (e.g., Latham & Arshoff, in press).

**Moderators**

Four variables moderate the goal-performance relationship. One moderator is ability (e.g., Locke, 1982). While the theory states that there is a linear relationship between goal difficulty and performance, an individual must have the knowledge and skills to attain the goal. A second moderator is situational or resource constraints (e.g., Mawitz, Folger, & Latham, 2014). In order for a goal to increase performance, an individual must have the necessary resources to attain it. A third moderator is feedback (e.g., Locke, Cartledge, & Koeppel, 1968). An individual must receive feedback on goal progress in order to know what to continue, start, or stop doing to attain the goal. A fourth moderator is commitment (e.g., Erez & Zidon, 1984).
Locke and Latham (1990) argued that goal commitment is the most important moderator in the goal-performance relationship because without it, by definition, one does not have a goal.

Although goal setting theory is among the most pervasive theories in HRM, a limitation of the theory is that it focuses entirely on conscious motivation (Latham & Locke, 2007). Future research should consider “subconscious as well as conscious motivation and the relationship between them” (Locke & Latham, 2004, p. 395). While there have been studies in HRM that consider the influence of subconscious processes as it relates to organizational justice (Zdaniuk & Bobocel, 2013), trust (Huang & Murnighan, 2010), and ethical decision making (Reynolds, Leavitt, & DeCelles, 2010), few studies have specifically considered the relationship between a subconscious goal and subsequent performance (Stajkovic, Locke, & Blair, 2006; Shantz & Latham, 2009, 2011; Ganegoda, Latham, & Folger, 2011; Latham & Piccolo, 2012; Chen & Latham, 2014). The foundation of the present experiment is Bargh’s (1994) automaticity model.

The Automaticity Model

The automaticity model states that goals can be activated subconsciously, and that the pursuit of goals can occur outside of conscious awareness (Bargh, 1994; Bargh & Chartrand, 1997, 1999). The model rejects the idea that conscious choice is always required for goal activation and operation. According to the automaticity model, a subconscious goal guides an individual’s actions in the absence of conscious awareness, or the monitoring of goal attainment (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001).

The Replicability Problem

Recently, many cognitive psychologists have questioned the automaticity model because of failed replications (e.g., Pashler & Harris, 2012; Pashler, Coburn, & Harris, 2012). Moreover,
the “replicability problem” has led to an e-mail debate between skeptics and believers of findings from primed goal experiments. This e-mail exchange was started by Kahneman (2012) who circulated a warning of a “train wreck looming” unless the results of priming experiments can be replicated. Further, the general public has also become aware of this issue as the New Yorker (Marcus, 2013) labeled this problem “the crisis of replicability,” and raised the possibility that the results of primed goals may be trivial or easily overrun by other factors.

Integrating Research on the Automaticity Model with Goal Setting Theory

Another criticism of research on primed goals is the lack of a theoretical framework (Dijksterhuis, 2014). A theoretical framework is necessary because it allows researchers and practitioners to predict, explain, and influence outcomes. Furthermore, a theory identifies the mediators and moderators that explain under which conditions the theory works. In terms of the “replicability problem,” Cesario (2014) noted that without a theory that identifies the boundary conditions, it is impossible to know the reason for a failed replication. Cesario argued that a theory of priming is needed that specifies exactly what features of an experiment are important. In addition, Stroebe and Strack (2014) suggested that a theory of priming is needed to enable replications.

Locke and Latham’s (1990, 2013) goal setting theory is among the most pervasive theories of motivation in organizational psychology (Miner, 2003; Mitchell & Daniels, 2003; Pinder, 1998). The theory appears relevant to the automaticity model because it has been shown that primed goals follow the same processing stages, predict the same phenomena, and produce the same outcomes as consciously set goals (Bargh et al., 2010).
Importance of the Research

As noted above, goal setting research has demonstrated that consciously setting specific, challenging goals leads to a significant increase in performance. Goal setting theory has largely ignored the subconscious as a storehouse of knowledge beyond that found in conscious awareness at any given point in time (Locke & Latham, 2002, 2005). Yet people are only able to process a limited amount of information consciously (Anderson, 1985). Because a subconscious goal consumes minimal cognitive resources, it should be beneficial to people in enabling them to focus on learning ways to perform complex tasks without depleting their limited cognitive resources (Miller, 1956).

A catalyst to continue the study of primed goals is the “replicability crisis” noted above. Given the scrutiny that this field of research has experienced, it is necessary for researchers to apply a theoretical framework that will bring to order to the research on priming. Goal setting theory may be used as a framework for conducting priming research because primed goals are hypothesized by the automaticity model to operate in the same way as conscious goals (Bargh et al., 2010). Several studies in social psychology and in HRM suggest that goal setting theory can explain and predict the results of priming a subconscious goal.

The present experiment contributes to the extant HRM literature on primed goals because it is the first to test whether there is a linear relationship between the difficulty level of a primed goal and subsequent performance. Given that we know that there is a linear relationship between goal difficulty and performance in terms of conscious goals, that is, the more difficult the conscious goal, the higher the performance (Locke, 1967; 1968), it is important from the standpoint of performance improvement to determine if this also applies to primed goals.
Hypothesis

Based on goal setting theory and the automaticity model, the laboratory experiment presented in Chapter 3 investigated the effect of priming a subconscious goal of various difficulty levels on an individual’s performance. Goal setting theory (Locke & Latham 1990, 2013) states that given ability, high goals lead to higher performance than easier goals. As such, it is important to determine whether primes that connote different levels of goal difficulty influence task performance. The following hypothesis was tested:

There is a linear relationship between degree of goal difficulty that is primed and task performance.

Chapter 2 elaborates on the theoretical framework for, and the empirical research underlying, the hypothesis.
Chapter 2
Literature Review

This chapter provides a review of the literature relevant to the experiment that was conducted. This review provides the theoretical framework from which the hypothesis for the study, discussed in Chapter 1, was derived.

Goal Setting Theory

Performance is a function of ability and motivation (Maier, 1955). Motivation is not only central in HRM, it is also important in other domains including athletics and academia. Goal setting theory, a cognitive theory of motivation, has provided managers, trainers, and educators with an effective means to increase the motivation of employees (Latham & Arshoff, 2013), athletes (Williams, 2013), and students (Morisano & Peterson, 2013).

Goal setting theory states that individuals who consciously set specific, difficult goals perform better than those with no goal, or those who are simply encouraged to do their best (Locke & Latham, 1990, 2002, 2013). For example, Brown and Latham (2000) demonstrated that unionized employees at a Canadian telecommunications company who set specific, difficult goals had significantly higher performance than those who were told to “do your best.” In addition, Galinsky and Mussweiler (2001) found that pursuing a challenging goal in a negotiation improved a negotiator's final outcome. Similarly, Huber and Neale (1987) found that in a bargaining situation, negotiators who were assigned specific, difficult goals were more profitable than negotiators who were assigned easy or vague goals.
Goal setting theory also states, and empirical research shows, that there is a positive linear relationship between the difficulty level of the goal that is set and an individual’s task performance. For example, Locke (1967) found that the performance of participants with the highest goal was over 250% higher than those with the easiest goal. Further, based on the results of 12 studies, Locke (1968) derived an empirical function. In all 12 experiments the functions were linear except when participants reached the limit of their ability. Meta-analyses have supported the linear relationship (Mento, Steele, & Karren, 1978; Tubbs, 1986; Wood, Mento, & Locke, 1987).

As noted in Chapter 1, research has identified the mediator and moderator variables of the goal-performance relationship.

**Mediators**

Research on goal setting theory reveals that goal setting leads to high performance for four main reasons. These four reasons are the mediator variables in the goal-performance relationship. A mediator is an explanatory variable that identifies why a causal relationship exists between an independent and dependent variable.

As noted in Chapter 1, one mediator variable is *choice / attention or direction*. Bagozzi and Warshaw (1990) found that goal pursuit is related to behavioural intentions, and that direction is a result of one’s choice to attain a specific goal. Hinsz and Ployhart (1998) conducted a laboratory experiment where participants were asked to study a list of word pairs to be used in a memory test. The researchers examined whether the participants were “trying” while performing the memory test. The measure of “trying” included four self-report measures, namely directed attention, effort, persistence, and the use of effective strategies. Goal attainment and task performance were predicted by the measure of trying, which was associated with directed
attention. Attention was assessed based on two items. The first item asked the participants what percentage of the time spent studying the work list that their mind wandered. The second item assessed how distracted or focused the participants were while studying the word list.

Both Kernan and Lord (1990) and Kanfer, Ackerman, Murtha, Dugdale, and Nelson (1994) found that direction occurs through the prioritization of multiple goals that is affected by the importance of one goal relative to another, rewards, and feedback. In an experiment conducted by Locke and Bryan (1969), participants were assigned to either an experimental or a control group. Participants performed a driving task where they were asked to drive a 3.4-mile course. Each participant drove around the course three times. Driving performance was assessed on five dimensions. After the first trip, participants in the experimental group were shown their scores on all five of the dimensions. They were then given a specific goal to improve their scores on specific dimensions during the second trip. After the second trip the experimental group was again shown their scores on specific dimensions, and were given goals to improve their scores on specific dimensions during the third trip. The control group drove the course without explicit goals. The results showed that the driving scores of those in the experimental group changed only on the dimensions for which they were given a goal for improvement.

A second mediator is effort. Setting a specific, difficult goal regulates effort so that it is proportionate to the difficulty level of the goal. In a study involving software engineers, Rasch and Tosi (1992) found that the difficulty level of the goal influenced the effort that participants expended which in turn affected performance. Latham and Locke (1975) conducted a study on woods workers who were paid on a piecework basis. When logging crews were given a limited number of day for mill deliveries, the crews harvested as much wood or more in those restricted number of days than they did in a normal 5-day work week. The limited time for mill deliveries
imposed on the loggers became a challenging goal for them and as such, increased their effort to attain it.

A third mediator is persistence. Goal setting improves performance because it increases an individual’s persistence until the goal is attained. In a series of six experiments conducted by Bavelas and Lee (1978), participants with easier goals stopped working sooner than those with harder goals. Huber (1985) found that participants with high goals worked longer to complete a maze than did those with moderate, easy or “do best” goals.

A fourth mediator is planning/strategizing. Setting goals enhances an individual’s planning and strategizing ways to attain the goal. Latham and Baldes (1975) conducted a field study at a forest products company. The company was losing money because the truck drivers were not loading their trucks to full capacity. As such, the drivers were given a goal to load their truck to the maximum legal weight. To attain their goal, the drivers devised a plan to raise the forward stakes on their trucks to enable them to better judge their trucks’ weight. Performance improved, and according to the company, the same increase in performance would have required a significant investment in additional trucks. In another study, Durham, Knight, and Locke (1997) found that plans and strategies mediate the goal-performance relationship on complex tasks. In short, goal effects are strongest on complex tasks only when plans are developed to attain them.

Each of the four mediators do not necessarily work in isolation. For example, an experiment conducted by Theodorakis, Laparidis, Kioumourtzologou, and Goudas (1998) found that athletes who set specific high goals exerted more effort, persisted longer, and thought of more task strategies which, taken together, increased their performance on an endurance task relative to those who did not set goals. Weingart and Weldon (1991) and Weldon, Jehn, &
Pradhan (1991) examined the mediators of goals set by groups. As is the case with goals set by an individual, effort, persistence, and the identification of strategies/plans to attain the group’s goal explained the goal-performance relationship. Unlike goals set for or by an individual, goal commitment and performance monitoring (i.e., feedback) were found to be mediators rather than moderators.

**Moderators**

A moderator is a boundary condition that explains the circumstances where the theory is valid. In essence, it answers the question: “When does this theory work and when does it not?” (Latham, 2012). The theory states and empirical research shows that four moderators strengthen or weaken the impact of goals on performance.

One moderator is *ability*. Studies have shown that goals are linearly related to performance when the goals range from easy to difficult. Performance drops when the goal is, or is perceived as, impossible to attain. For example, Locke (1982) conducted an experiment where participants were asked to brainstorm uses for common objects. The participants were assigned goal levels ranging from 2 to 28 uses. Goals were linearly related to performance when the goals ranged from easy to difficult, but were unrelated to performance after the goals became impossible to attain. Lee et al. (1997) showed that if goals are perceived as impossible to attain, offering a bonus for goal attainment can actually decrease motivation. In a study of Air Force trainees, Kanfer and Ackerman (1989) showed that setting specific, high performance goals are detrimental to individuals if they do not have the requisite ability to attain the goal. This finding will be discussed further in the section on learning goals.

*Situational resources / constraints* is a second moderator. When individuals lack the necessary resources to obtain their goal, the goal-performance relationship is attenuated. This
was demonstrated in a correlational study (Mawitz, Folger, & Latham, 2014). When supervisors perceived that they lacked the resources to attain their goal, they reported hindrance stress, which in turn was related to abuse of their subordinates.

*Feedback* is a third moderator variable. This is because feedback provides information as to what one needs to continue doing, start doing, stop doing, or be doing differently to attain the goal (Locke, Cartledge, & Koeppel, 1968). Cellar, Degrendel, Sidle, and Lavine (1996) found that receiving feedback in relation to a goal leads to higher performance than goal setting alone.

A fourth moderator variable is *commitment*. Erez and Zidon (1984) showed that goal difficulty level is more highly and positively related to performance for people with high rather than low goal commitment. In addition, a field study conducted by Porter and Latham (2013) showed that leaders should not only focus on goal setting, but they must also focus on ways to ensure that employees are committed to goal attainment because both goal setting and goal commitment were strongly related to their department’s performance.

**Subconscious Goals**

A limitation of goal setting theory is that it focuses entirely on conscious motivation (Latham & Locke, 2007). In addressing future directions for the study of motivation, Locke and Latham called for research on “subconscious as well as conscious motivation and the relationship between them” (Locke & Latham, 2004, p. 395).

**The Automaticity Model**

The automaticity model (Bargh, 1994; Bargh & Chartrand, 1997, 1999) argues that goals can be activated subconsciously and that the pursuit of goals can occur outside of conscious awareness. The model further states that a subconscious goal guides an individual’s actions in
the absence of awareness or conscious monitoring of goal attainment (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001). It is important to also note that the model maintains that the engagement of a subconscious goal follows the same processing stages, predicts the same phenomena, and produces the same outcomes as consciously set goals.

Specifically, Bargh’s model proposes that (1) goals are represented in memory in the same way that traits and stereotypes are represented. (2) Because traits and stereotypes are capable of being automatically activated by features of the environment, goals should have this capability as well. (3) When a person consistently chooses to pursue a particular goal in a certain situation, over time, the representation of that goal becomes automatically linked in memory to the features of that situation. Finally, (4) the goal becomes automated and operates within that situation without the need for conscious awareness (Bargh, 1990). However, no study in the social psychology literature, to the author’s knowledge, has examined subconscious goals within the theoretical framework of goal setting theory. Instead, the focus of these studies has been largely methodological, namely on ways of priming goals in the subconscious and the different dependent variables that are affected.

**Priming**

Lashley (1951) introduced priming in the psychology literature. He argued that there is an intervening variable that occurs between an individual’s intention and the actual production of a response or behaviour. He called this the priming of a response. When social psychologists currently refer to priming, they are referring to the passive, subtle, and unobtrusive activation of relevant mental representations by external stimuli, such that people are not aware of the influence exerted by those stimuli (e.g., Bargh & Huang, 2009). This occurs through the spread of activation from one concept or neural site to another (Klatzky & Creswell, 2014).
The automaticity model states that priming effects are ubiquitous and pervasive in terms of an individual’s motivation in general, and in terms of goal pursuit in particular (Bargh, 2006). Priming research has shown that the passive perception of environmental stimuli directly triggers higher mental processes in the absence of conscious intent (Bargh & Huang, 2009). As such, goals can be activated through priming various stimuli in the absence of an individual’s awareness. Once activated, a primed goal operates in the same way as a conscious goal (Bargh, Gollwitzer, & Oettingen, 2010). The only difference is that it does so outside of awareness.

However, when Bargh as well as other social psychologists who study this phenomenon refer to a conscious goal, they are referring to a vague goal (e.g., focus on quality) rather than a goal that is specific (e.g., improve quality by 15%) as is emphasized by goal setting theory.

There are two types of primes, namely, supraliminal or subliminal. They produce the same behavioural outcomes (Bargh & Chartrand, 1997). Supraliminal primes are presented to individuals as part of a conscious task, but the individual is unaware of the influence of the prime on his or her subsequent behaviour. Subliminal primes, on the other hand, are presented below perceptual threshold, and hence are not identifiable by the individual. Chartrand and Bargh (2002) have argued for the use of supraliminal rather than subliminal primes as the latter lack ecological validity. As such, a supraliminal prime was used in the present experiment.

A frequent method used for supraliminal priming is the Scrambled Sentence Test (Cosin, 1969) where participants are told that the purpose of the task is to assess their language ability. They are instructed to make coherent sentences out of a set of scrambled words. Only the participants in the experimental condition are given words that are related to the prime (e.g., honest).
When conducting supraliminal priming, manipulation checks for awareness of the independent-dependent variable relationship are essential since the prime is presented at the conscious level. This is done through a funneled debriefing (Chartrand & Bargh, 1996) where participants are probed in a systematic way to determine if they had suspicions of, or knowledge as to, the purpose of the experiment. Participants should be unaware of the influence of the prime on their subsequent behaviour (Chartrand & Bargh, 1996). For example, Fitzsimons and Bargh (2003) conducted an experiment where participants were randomly assigned to either a friend-priming condition or a coworker-priming condition. In the friend condition, participants were asked to think of a good friend. In the coworker condition, they were asked to think of a coworker, with whom they have a positive relationship, and who is approximately equal in terms of status at work. They were then asked to complete a questionnaire about their friend or coworker. After the questionnaire, participants were asked whether they would be willing to participate in a longer study to help the researcher. After answering the question, participants completed a debriefing questionnaire to determine whether they were aware of the purpose of the study. The results demonstrated that participants in the friend-priming condition were more likely to subsequently volunteer to help the researcher, and to participate in an additional, longer study than participants in the coworker-priming condition.

In contrast to supraliminal priming where participants see the prime, subliminal priming involves a brief presentation of a prime below perceptual threshold, which is then immediately masked by another stimulus. This is followed by an awareness check to see if an individual detected the prime. For example, Zhong and DeVoe (2010; Experiment 1) used subliminal primes in a laboratory experiment where participants in the experimental condition were subliminally exposed to flash images of six fast food restaurants (McDonald’s, KFC, Subway, Taco Bell, Burger King, and Wendy’s) for 12 milliseconds. Participants in the control condition
were exposed to blank squares. Following the subliminal prime, participants were asked to read a
description of the city of Toronto, and then to turn to the next page. The dependent variable was
the speed at which the participants turned to the next page after reading the description.
Participants subliminally primed by the fast food logo had significantly faster reading speed than
those in the control group who were primed by blank images. In the check for awareness none of
the participants noticed the primes on the computer screen.

**Priming Subconscious Goals in Social Psychology**

Social psychologists have investigated the influence of priming on many dependent
variables. Several of these experiments have examined behaviours that are arguably relevant to
organizational contexts. For example, Bargh, Gollwitzer, Lee-Chai, Barndollar, and Trotschel
(2001) subliminally primed a goal for cooperation. Participants were then required to engage in a
negotiation exercise using a computer that was alleged to be connected to another participant.
The prime involved the Scrambled Sentence Test, (Costin, 1969) where participants in the
experimental condition were primed for cooperation through 10 sets of scrambled words related
to cooperation (e.g., dependable, helpful, support, reasonable, honest, cooperative, fair, friendly,
tolerant, and share). In the control condition, all the scrambled words were neutral (e.g., salad,
umbrella, city, gasoline, wet, purposeful, switch, lead, mountain, and zebra). After forming
sentences from the scrambled words, the participants engaged in the negotiation, specifically a
resource-management game, where they assumed the role of a fisherman. In the conscious-
cooperation goal condition, the instructions stated that it was important that participants
cooperate to ensure that there are 70 fish in the lake. They then made decisions at the end of each
fishing season (i.e., trial) on how many fish to keep, and how many to return to the lake. Both the
primed and the conscious-goal manipulations were effective in inducing cooperative behaviour.
The effect of two types of goals were additive. Cooperation, however, was greater when participants were given a conscious goal to do so.

Aarts, Chartrand, Custers, Danner, Dik, Jefferis, and Cheng (2005) conducted a laboratory experiment to test whether priming a social stereotype activates a goal of helping people. Participants were told that they would be participating in a set of experiments by several different researchers. The first task was a computer-skill task in which the participants were told that the researcher was interested in their ability to use a computer mouse. Next, participants were subliminally primed with a stereotype, nursing, as nursing is traditionally known for helping others. After the priming manipulation, participants were asked to provide feedback on the computer-skill task that they performed at the beginning of the study that was allegedly designed by an undergraduate student. At this point, participants could either immediately leave the laboratory or stay to give the undergraduate student feedback. Those who were subliminally primed with the word nurse were more likely to remain to give feedback than those in the control group.

Chartrand, Huber, Shiv, and Tanner (2008) conducted a series of experiments using a supraliminal priming technique that involved the Scrambled Sentence Test (Srull & Wyer, 1979). Participants were shown words related to the desired prime, namely spend versus save. They were then told to make grammatically correct sentences from four of the five words (e.g., spend: “he prestige what want did” answer: “what did he want”; save: “he frugal what want did” answer: “what did he want”). They were then given an unrelated task to purchase socks. Participants chose the higher-priced socks in the “spend condition” significantly more often than did those in the “save condition.”
In a second experiment, the time interval between the goal-priming task and the choice task was manipulated. Again, the choice of the more expensive option was higher in the primed “spend condition” than in the primed “save condition.” In addition, the results showed that the choice of the expensive option increased as the time interval increased from three to eight minutes. Similarly, the choice of the expensive option decreased in the primed save condition as the time interval increased. This suggests that there was no satiation of the primed goals; rather the effects of the two primes persisted across time.

In their third study, the same priming method was used. However, the moderating role of realism on choice was examined by looking at the impact of the first choice, that was either real or hypothetical, on a second actual, rather than hypothetical, choice. The primed goals carried over to the subsequent final choice only when goal satiation was low, that is, only when the initial choice was hypothetical. When the choice was real, that is, the goal was truly attained, the effect of the two primes were attenuated.

**Automaticity Research in HRM**

As noted earlier, a limitation of goal setting theory is that it does not take into account that the subconscious is a storehouse of knowledge and values beyond that which is found in awareness at any given point in time (Latham & Locke, 2007; Locke & Latham, 2002, 2005). The subconscious mind has a large storage capacity which frees the conscious mind to focus on new facts and to make new integrations (Latham, 2012). This is important for HRM because as Hassin, Bargh, and Zimmerman (2009) noted:

“Automatic processes in general, and automatic goal pursuit in particular, are usually conceived of as the opposite of controlled processes: They are unintentional, nonconscious, relatively effortless, and ballistic (running to completion once started, without any further conscious direction or guidance). Their main advantage lies in freeing our very-limited-capacity consciousness from many burdens, and they thus improve the
efficiency with which we cope with our complex and ever-changing environment.” (Hassin et al, 2009, p. 21)

An emerging research stream in HRM, based on priming studies in social psychology, suggests that a novel way to increase performance in the workplace is through priming a goal in the employee’s subconscious (Friedman, 2013; Latham, Stajkovic, & Locke, 2010; Latham & Locke, 2012). To date, only a few studies have considered the effects of primed goals on organizationally related behaviour.

Stajkovic, Locke, and Blair (2006) conducted the first laboratory experiment on the effect of both subconscious and specific conscious goals for performing a brainstorming task, an organizationally relevant dependent variable. Consistent with Bargh’s methodology, they used a supraliminal priming technique, namely the Scrambled Sentence Test, to prime achievement motivation. Consistent with goal setting theory, the participants were also given a specific difficult, easy, or “do your best” goal. A main and an interaction effect for both the conscious and primed goals were obtained. A day later, participants were asked to recall the sentences they had unscrambled and/or the specific assigned goal they were given. They then engaged in a second brainstorming task where they were asked to brainstorm uses for a wooden ruler. Again, main and interaction effects were obtained for the two types of goals on performance. The interaction effect, however, was a methodological artifact due to the easy goal condition. The participants in the easy goal condition stopped working after the goal was attained. When this condition was deleted, the interaction effect disappears (Locke, personal communication). The important finding of this experiment is that the effect of the two types of goals on performance is additive.

Social psychology experiments have been content to show that a primed goal can affect behaviour in the absence of awareness. They have not investigated whether the prime affects the
subconscious. The Thematic Apperception Test (TAT), developed by Morgan and Murray (1935), is a projective technique that assesses covert, unconscious motivation (Murray, 1943). Participants write an imaginative story about each of a set of neutral picture cue cards.

The TAT was used by McClelland (1989) to develop a theory of implicit motives. Implicit motives theory states that there are “motivational dispositions that operate outside of a person’s conscious awareness” (Schultheiss, 2008, p. 603). Implicit motives are different from explicit motives in terms of antecedents and behavioural outcomes. Since implicit motives occur outside an individual’s conscious awareness, they cannot be measured using self-report (McClelland, Koestner, & Weinberger, 1989; Schultheiss & Pang, 2007; Schultheiss & Brunstein, 2010).

To determine whether a primed goal actually affects the subconscious, Shantz and Latham (2009) used the TAT to determine whether the primed goal influenced a person’s implicit motive for achievement. After viewing the prime, namely a photograph of a woman winning a race, participants were asked to write three stories based on three pictures that were shown to them, specifically, a dog, a tree, and a car. Each story was analyzed using a computer software program, namely, the Linguistic Inquiry and Word Count (LIWC) (Pennebaker, Francis, & Booth, 2001). The LIWC counts the extent to which people use different categories of words in their stories. Individuals who were primed wrote stories using significantly more achievement-related words than those in the control condition even though the length of the stories in terms of number of works used did not differ significantly between conditions. Schultheiss (2013) found that the LIWC software yields results similar if not identical to the content coding of picture stories developed by Morgan and Murray (1935) and used by McClelland et al. (1989).
Shantz and Latham (2009) then tested the effectiveness of a primed goal alone and in conjunction with a specific, difficult, consciously set goal in the workplace. Employees in a call center were either primed using a photograph of a woman winning a race, or given a specific high goal to collect $1200 from donors during their 3-hour shift. Performance was assessed based on the amount of dollars raised from donors. At the end of the shift, all the employees were administered a questionnaire consisting of five open ended questions to assess their awareness of the purpose of the photograph: (1) “What do you think is the purpose of this experiment?” (2) “What do you think this experiment was trying to uncover?” (3) “Did you think that the information sheet you were given at the beginning of your shift was related in any way to your performance on your shift?” (4) “If so, how?” and (5) “Did anything on the information packet affect what you did?” These questions were adapted from Bargh and Chartrand (2000) and Stajkovic et al. (2006). None of the employees were aware of the primed goal-performance relationship. There was a significant main effect for both the primed and the specific, high conscious goal. Similar to Bargh et al. (2001), the conscious goal had a stronger effect on the amount of money raised than did the primed goal. The practical significance of this experiment for HRM is the additive effect of the two types of goals on an employee’s performance.

The results of this first field experiment on priming were replicated in two additional field experiments (Shantz & Latham, 2011). The results from these three field experiments provided further evidence that a primed goal can have a positive effect on job performance. A meta-analysis of the data from these three experiments was conducted as the number of employees in each of them was relatively small. The results revealed an average $d$-statistic of 0.56 (Shantz & Latham, 2011).
Because goal setting theory emphasizes the importance of goal specificity, Latham and Piccolo (2012) conducted a field experiment in another call center to test whether a subconscious goal that is context specific to the work that is to be performed leads to a significant increase in job performance relative to a primed general achievement goal. The prime for the context-specific condition was a photograph of three call center employees performing their job. The prime for the general achievement condition was the same photograph of a woman winning a race used by Shantz and Latham (2009, 2011). Employee performance was measured in terms of the number of pledged dollars to an organization. Those who saw a photograph of people calling donors raised 16% more money than the employees who viewed a photograph of a racer, and 85% more than those in the control group. Those who saw the photograph of the racer raised 60% more money than those in the control group. To prevent demand effects and experimenter bias from influencing the results, the call-center supervisor, rather than the researchers, gave the information packets to each caller. In addition, the supervisor did not make any mention that the employees were participating in a study, did not draw attention to the experimental material, and separated callers by condition so that each would be unaware of the differences among fact sheets in terms of type of photograph.

Dennis, Minas, and Bhagwatwar (2013) tested whether priming can be used to influence creativity in a group brainstorming task. Creativity was defined by novelty, workability, and relevance (Dean et al., 2006). Participants were either primed with a neutral prime or an achievement prime using a modified version of the Scrambled Sentence Test, where they developed newspaper headlines from a set of words. They then worked as a group on the brainstorming task on ways to increase tourism or ways to reduce pollution within the state. In order to measure creativity, the authors created a master list of all the ideas mentioned in the study and then assessed the creativity of each idea on the list. Each idea was then given a score
and the performance of each group was then scored on total creativity of their ideas. The results showed that individuals in the achievement prime condition generated significantly more ideas and were more creative than those in the control condition.

In a laboratory experiment, Ganegoda, Latham, and Folger (2011) used mission statements of organizations to prime a goal to behave fairly on a subsequent task of importance in HRM in general and industrial relations (IR) in particular, namely negotiations. Specifically, participants in the experimental group circled words in the mission statements they associated with fairness. Participants in the control group merely rank ordered their preference for the mission statements. This was followed by a filler task where all participants generated ways to decrease health costs in organizations. The purpose of the filler task was to minimize the possibility of participants seeing the relationship between the prime, the negotiation task, and the dependent variables that assessed fairness. The participants then engaged in a negotiation where measures of profit inequality were assessed. Those who were primed with the fairness goal displayed lower levels of profit inequality with their negotiation partner, higher levels of perceived fairness regarding the offer, and higher levels of offer acceptance compared to those in the control group.

Zdaniuk and Bobocel (2013) also conducted a laboratory experiment to examine whether subconscious processes influence the enactment of fair and unfair behaviour. In Phase 1 of the experiment, participants read a description of a fair and an unfair leader, along with their respective photographs. They were then subliminally exposed to the face of the fair, the unfair leader, or a neutral face. In Phase 2, the participants assumed the role of a manager and wrote a letter communicating a dismissal decision to a subordinate. Participants were significantly less fair when communicating their dismissal decision after being subliminally exposed to the face of
the unfair leader compared to those in the other two conditions. These results demonstrate that priming fairness/unfairness can influence subconscious cognitive processes and the enactment of fairness towards a third party.

Trust is a dependent variable that has been examined primarily in terms of conscious processes (Butler, 1991; Montest & Irving, 2008; Malhortra & Murninghan, 2002). Consequently, Huang and Murnighan (2010) conducted a series of studies to determine whether trusting others begins subconsciously. Participants listed and ranked the names of three people they liked and disliked as well as two to four reasons for doing so. They were then subliminally primed with the names they generated. Participants then engaged in a trust game where they were given the opportunity to allocate up to $5 to another participant who would receive three times the amount. The other person could choose how much of this amount they would return to the participant. After this game, participants answered questions regarding whether they trusted the person they allocated money to without knowing how much money they will receive back. The primed names influenced subsequent trusting behaviour as measured by the amount of money a participant allocated to another participant.

Reynolds, Leavitt, and DeCelles (2010) examined the automatic aspects of moral decision making. Participants first completed the Implicit Association Test (IAT) that measures implicit assumptions about the morality of business. They then completed an in-basket exercise in the role of a manager. The primes were manipulated in a corporate memo where the CEO praised the corporate culture, and in doing so either described a culture that emphasizes success or one that emphasizes values. Immoral behaviour was measured in terms of the responses to an insurance claim. Participants were informed that company product had been destroyed and they were asked to file the insurance claim. Participants were provided with information about the
product including the cost of the product, the advertised cost of the product and the going rate of
the product on the black market. They were asked to indicate the value of the product for
reimbursement. Behaviour was considered to be moral if the price indicated was at or just below
the advertised price. In contrast, behaviour was considered immoral if the value was above the
advertised price. The results showed that participants who had the general belief that business is
moral as assessed at the beginning of the experiment and were then exposed a competitive prime
actually engaged in immoral behaviour.

Wang, Zhong, and Murninghan (in press) investigated whether priming a calculative
mind set would lead participants to overlook the social and moral consequences of their
subsequent decisions and thus act selfishly and unethically. A calculative mind set was primed
by exposing participants to a calculative task, namely by asking them to calculate net present
value or asking them to complete a series of math problems from the Graduate Record
Examination. In a series of four experiments, participants first completed a calculative or
comparable non-calculative task (i.e., determining the impact of the Industrial Revolution or
completing a series of verbal problems from the Graduate Record Examination) followed by a
supposedly unrelated decision task. The unrelated decision involved participants acting as a
dictator or engaging in a modified ultimatum game. Compared to participants in the non-
calculative task condition, participants in the calculative task condition behaved more selfishly in
the Dictator Game, by keeping more money, and behaved more dishonestly in the modified
Ultimatum Game by lying.

While studies have tested the effect of priming a subconscious goal on performance, only
one has examined the effect of priming both a performance and a learning goal. Goal setting
theory differentiates between learning and performance goals for two reasons. First, a
performance goal focuses attention on a task outcome whereas a learning goal focuses on learning ways to perform a task as opposed to relying on extant knowledge or skill (Seijts & Latham 2005). Second, on novel tasks, a performance goal diverts limited attentional resources away from mastering the task (Kanfer & Ackerman, 1989), whereas a learning goal shifts attention to thinking of task relevant strategies (Seijts & Latham 2001; Seijts, Latham, Tasa, & Latham, 2004).

Chen and Latham (in press) conducted a laboratory experiment to examine the effect of priming a performance goal, a learning goal, and both a performance and a learning goal on a task that requires an individual to acquire knowledge in order to perform it effectively. The primed performance goal was the photograph of the racer that had been used by Shantz and Latham (2009; 2011) and Latham and Piccolo (2012). The learning goal was a photograph of Rodin’s “The Thinker.”

Participants were randomly assigned to one of four conditions in a 2 (The Thinker vs. control group) x 2 (racer vs. control group) x 3 (trials) factorial design, namely, (1) a photograph of The Thinker, (2) a photograph of a racer, (3) photographs of both the Thinker and the racer, and (4) a control group. All participants were first given instructions for a scheduling task. This task, developed by Earley (1985), meets Wood’s (1987) criteria for a complex task as it requires an individual to consider large amounts of information and coordinate information from different sources. All participants were given four minutes to practice making schedules. They were then tasked to turn to the Picture Story Exercise (PSE) (McClelland, Koestner, & Weinberger, 1989). As is the case with the TAT, participants write imaginative stories about a series of photographs of different social situations (Schultheiss & Pang, 2007). The PSE differs from the TAT in that the pictures for the PSE were obtained from magazines and other print sources; thus they pertain
to current, everyday contexts. The pictures on the TAT cards were designed and chosen for clinical psychology purposes. In short, the PSE is an approach to “studying and measuring motivations systematically and scientifically” (Pang, 2010b, p. 32). Moreover, the PSE has been found by implicit motives researchers to have low cue ambiguity, and both high test-retest and inter-rater reliabilities (Pang, 2010a, 2010b; Schultheiss & Pang, 2007; Schultheiss, Liening, & Schad, 2008).

In the upper-left hand quadrant of each page of the PSE used by Chen and Latham, there were (1) four identical photographs of a woman winning a race (a primed performance goal), (2) four identical photographs of the Thinker (a primed learning goal), (3) photographs of two woman racers and two photographs of The Thinker, or (4) a photograph of two trees and two rocks (control). Analysis of the stories showed that the stories written by participants primed with The Thinker contained significantly more **insight** words than those written by participants in the control condition and those primed with the racer. The stories written by participants primed with the racer contained significantly more **achievement** words than those written by those in the control condition as well as those primed with The Thinker. The stories written by participants primed with both photographs contained significantly more insight and achievement words than did those in the control condition. Finally, the stories written by participants primed with both photographs contained marginally significantly more insight words than did those in the racer only condition. However, the stories contained significantly more achievement words than did those in the Thinker only condition.

Following the administration of the PSE, the participants returned to the scheduling task. They were asked to complete as many accurate class schedules as possible on three separate trials. Each trial lasted 8 minutes. Participants then completed the funnel debriefing questionnaire
to check for awareness. Analysis of the answers to the funneled debriefing showed that no participant reported an awareness of the priming technique and no participant correctly identified the purpose of the experimental procedure. Hence, no participant was dropped in the subsequent data analyses.

In terms of the dependent variable, namely, the number of correct schedules generated on each of the three trials, the results showed a significant main effect for only the primed learning goal. The results of this experiment are consistent with those conducted on consciously set learning and performance goals (e.g., Winters & Latham, 1996).

**Integrating Research on the Automaticity Model with Goal Setting Theory**

As noted earlier, the automaticity model has been criticized for its lack of theory (Latham, Stajkovic, & Locke, 2010; Strack & Deutsch, 2004; Dijsterhuis, 2014; Cesario, 2014; Strobe & Strack, 2014). Goal setting theory (Locke & Latham, 1990, 2002) may prove useful in this regard.

Goal setting theory (Locke & Latham, 1990, 2002, 2013) states that goals enhance performance. Shantz and Latham (2009, 2011) showed that priming goals in the subconscious too increases job performance. In addition, Latham and Piccolo (2012) demonstrated that priming goals that are context specific further enhances job performance. The importance of goal specificity is central to goal setting theory.

Several mediators and moderators specified by goal setting theory explain why a primed goal influences behaviour. With regard to the theory’s mediators, studies by social psychologists have shown that a primed goal affects behaviour through effort and persistence (e.g., Hassin,
As noted earlier, effort and persistence are two of the four mediators in goal setting theory.

Dik and Aarts (2007) also demonstrated that primed goals affect performance through effort. In their experiment, they randomly assigned participants to either no, low, medium, or a high effort condition. An animated film was shown of one “ball” helping another “ball” get a kite out of a tree by finding a ladder behind one or more doors. Effort was manipulated by varying the number of movements of the “ball.” Participants were then given a word completion task where they were asked how much effort they exerted on the word completion task. After completing this task they were asked to help a researcher, a seemingly unrelated request. Perceiving more effort by the “ball” led to greater self-reported effort on the word completion task, as well as willingness (effort) to help the researcher.

Aarts, Custers, and Marien (2008) obtained further support for the contention that primed goals affect performance through effort. The author’s randomly assigned participants to one of three conditions namely, a primed, a primed plus a reward, and a control condition. Participants had to detect dots that were presented either above or below words that were briefly presented on a screen. Exertion related words were either primed alone, paired with positive affect (i.e., a reward) or there was no prime. They then squeezed a handgrip. Those in the goal priming and priming plus reward condition squeezed significantly earlier and harder compared to those in the control condition.

As noted earlier, a moderator in goal setting theory is ability. When a person lacks ability, specific, difficult performance goals are not effective. When a task requires the acquisition of knowledge, a conscious learning rather than a performance goal enhances performance. When
individuals are given a task they lack the ability to perform, priming a learning goal is an effective way to enhance performance.

**Current Research**

While there has been progress in determining the applicability of goal setting theory to the automaticity model, there remains a key question. As noted earlier, goal setting theory asserts that there is a positive linear relationship between degree of goal difficulty and performance (Locke, 1967). As such, this study seeks to determine the extent to which the difficulty level of subconscious goals also increases performance.
Chapter 3
Experiment

An experiment was conducted to test the extent to which different primes that connote various levels of goal difficulty influence performance on a strength task. As noted in Chapter 1, the following hypothesis was tested:

There is a linear relationship between the degree of goal difficulty that is primed and task performance.

This hypothesis was tested because it is a core premise of goal setting theory (Locke & Latham, 1990, 2002, 2013).

Method

Sample

This study was conducted in a laboratory in a large Canadian university. Participants either received course credit or $2 for participating in the study. The sample size was 126 males between ages 18 and 46 ($M=22.6; SD=4.68$). A Cohen’s Power test suggested a sample size of 90 was needed to determine a statistically significant difference between the means. Participants were randomly assigned to four conditions. The dependent variable was how hard they pressed on a digital food scale. This task was chosen because it assesses performance on an objective “hard criterion” measure. Thus this dependent variable is relatively uncontaminated by factors beyond an individual’s control.
Procedure

All participants sat at a desk. They were asked to complete a word search puzzle for five minutes. The purpose of the word search puzzle was to give participants a filler task to minimize the probability of them becoming aware of the hypothesized relationship between the prime and performance on the strength task. The word search only contained neutral words (e.g., dog, strawberry, window, chocolate, pencil, purple) (see Appendix 1). In the top right corner of the document of the word search appeared one of the primes (see Appendix 2). In one condition, there was a photograph of a person lifting 20 pounds (easy goal). In the second condition, there was a photograph of the same person with slightly bigger muscles lifting 200 pounds (moderately difficult goal). In the third condition, there was a photograph of this person with even bigger muscles lifting 400 pounds (difficult goal). Thus the picture of the weightlifter was held constant across the condition. These weights were chosen based on the performance of Olympic weightlifters who typically lift, on average, 568 pounds (International Weightlifting Federation, 2014). As such, a goal of 400 pounds is specific and difficult, 200 pounds is moderately difficult, and 20 pounds is considered relatively easy. Using their little finger, each participant was then asked to “press as hard as you can on the middle of the digital food scale” (Starfruit 5-kg digital weight scale).

After completing the strength task, participants turned to the next page and answered the following four questions to assess for their awareness of the purpose of this experiment (Bargh & Chartrand, 2000; Shantz & Latham, 2009): (1) What was the purpose of this exercise? (2) What do you think this study was trying to uncover? (3) Did you think that any of the tasks you did were related in any way? If yes – in what way were they related? (4) When you were pressing on
the scale, did you notice anything unusual? Participants were also asked to include their age.

After completing the awareness check, participants were then debriefed by the researcher.
Chapter 4
Results

Awareness

Three participants were aware of the purpose of the experiment, as determined by the answers to the funneled debriefing questions. Consequently, they were dropped from the study. A fourth participant did not complete the awareness check and hence was also dropped from the study. Thus the number of participants who saw the photograph of the person lifting 400 pounds, 200 pounds, 20 pounds and in the control group were 31, 30, 30, and 31, respectively.

The remaining participants did not show any awareness to the purpose of this experiment based on their answers to the funneled debriefing question. In response to the first question regarding the purposes of the experiment, typical answers included: no idea, unsure, the relationship between physical energy and concentration, and the relationship between strength before and after a task. Answers to the second question regarding what the study was trying to uncover included: I don’t know, concentration, ability to find words, and whether performance on a word search task influences physical strength. Answers to the third question regarding whether any of the tasks were related included: no, I don’t know, and my physical power was weaker after concentrating on the word search. Finally, when asked whether participants noticed anything unusual when pressing on the scale, the answers included: no, and I found myself using a lot of concentration.

Hypothesis

A one-way analysis of variance (ANOVA) revealed a significant main effect \( F(3,121)=2.80, p<0.05, d=0.66 \). Table 1 reports descriptive statistics for all four conditions. A planned independent two-tailed t-test indicated that participants who saw the photograph of the
person lifting 400 pounds ($M=3.54$, $SD=0.96$) pushed significantly harder than those that saw the photograph of the person lifting 200 pounds ($M=2.91$, $SD=1.20$, $t(58)=2.23$, $p<0.05$), pushed significantly harder than those who saw the photograph of the person lifting 20 pounds ($M=2.73$, $SD=1.02$, $t(59)=3.16$, $p<0.01$) and pushed significantly harder than those in the control group ($M=2.93$, $SD=1.37$, $t(59)=1.99$, $p<0.05$).

The Pearson product moment correlation between the level of goal difficulty that was primed and task performance was significant ($r=.30$, $p<.004$). A trend analysis was also conducted to determine whether there is a linear relationship between the difficulty level connoted by the prime and performance on the task. Consistent with Locke’s (1967, 1982) two experiments, the control group was deleted from the analysis because the purpose of this experiment was solely to determine whether there is a linear relationship between primes that connote different levels of goal difficulty and performance. Given that the weights were not equally spaced, the process described by Keppel and Wickens (2004; p. 105) was used to determine the coefficients for unequal trends. Specifically, the appropriate coefficients for the spacing between the goals connoted in the prime were selected. The coefficients 10, 100, and 200 were selected, as they are equal to the spacing between the goals connoted by the prime namely, 20, 200, and 400 pounds. The average of the three coefficients is expressed as $\frac{310}{3}$. Consistent with Keppel and Wickens, the average of the three coefficients was subtracted from the coefficients. As such the linear coefficients are $\{-\frac{280}{3}, -\frac{10}{3}, \frac{290}{3}\}$. To convert the fractions into integers, each coefficient was multiplied by 3. Finally, the values entered into the linear weighted contrasts were \{-280, -10, 290\}. The results revealed that there is a significant linear relationship between the difficulty connoted by the three primes and subsequent task performance [$F(1, 90) = 8.61$, $p<0.01$, $d=0.33$]. Therefore, as shown in Figure 1, the hypothesis was supported.
Chapter 5
Discussion

The purpose of the present experiment was to determine whether there is a linear relationship between subconscious goal difficulty and performance as specified by goal setting theory (Locke & Latham, 1990, 2002, 2013). The answer to this question provides further evidence as to whether goal setting theory explains the performance effects of subconscious goals. The present hypothesis was supported. There is a significant linear relationship between the difficulty level connoted by a prime and task performance.

Theoretical and Practical Significance

Priming research has been under scrutiny by cognitive psychologists (Harris et al. 2013; Pashler, Coburn, & Harris, 2012; Kahneman, 2012; Marcus, 2013). There are two major criticisms. The first is that there has been no theoretical framework to explain the results. The second is that there have been failed replications of priming research (Cesario, 2014; Strobe & Strack, 2014; Dijksterhuis, 2014). In a special issue of Perspectives on Psychological Science, researchers suggested that the application of theory would help solve the replicability problem (Cesario, 2014; Strobe & Strack, 2014; Dijksterhuis, 2014). Further, Cesario (2014) argued that what is needed is a sufficiently developed theory of priming that specifies exactly what features of an experiment are important and with what effect. Moreover, he suggested that without a theory that specifies moderators, a failure to replicate another researcher’s findings is ambiguous with respect to the inferences that can be drawn. Similarly, Stroebe and Strack (2014) suggested that a theoretical framework to bring order to priming research is necessary in order to enable replications to ascertain the experimental contributions that reflect the theoretical variables.
manipulated and measured in the original study. The contribution of the present experiment in terms of theoretical significance is that it provides support for the application of goal setting theory as a framework for conducting priming research with the purpose of influencing behaviour (e.g., task performance).

While goal setting theory is one of the most cited theories of motivation in HRM (Miner, 2003; Mitchell & Daniels, 2003; Pinder, 1998), it has been over-looked by the social psychologists who conduct research on the effects of primed goals. This is surprising given that one of the premises of the automaticity model is that primed goals appear to operate in the same way as conscious goals in that they follow the same processing stages and predict the same outcomes (Bargh, et al., 2010). The only difference is that primed goals influence performance outside of awareness (Bargh, et al., 2010). Furthermore, studies have demonstrated that goal setting theory explains the results obtained from using the automaticity model. For example, it has been shown that a primed goal affects behavior through effort and persistence (e.g., Hassin, 2008), two mediators in goal setting theory. In addition, a core tenet of goal setting theory is that goals need to be specific in order to enhance performance. Latham and Piccolo (2012) showed that call center employees who saw a context specific prime namely, a photograph of call center employees, raised significantly more pledged dollars to an organization in comparison to those who saw no photograph and those that saw a general photograph.

The present study tested a core tenet of goal setting theory, namely that the difficulty level of a primed goal affects performance. This finding is significant theoretically because it is the first to consider whether subconscious goals of different difficulty levels influence performance. In the present experiment, participants who saw the difficult prime of a weightlifter attempting to lift 400 pounds performed better on the strength task than those who saw a
photograph of a weightlifter lifting 200 pounds and 20 pounds or those who did not see any photograph. The participants who saw the photograph of the weightlifter lifting 20 pounds had the lowest performance on the strength task. This finding is consistent with goal setting theory and empirical research on consciously set goals (Locke et al., 1989). Taken together, both of these findings suggest that goal setting theory is an appropriate theoretical framework to guide research on the automaticity model (Bargh et al., 2010).

In addition, this study builds on the study by Aarts, Custers, and Marien (2008) who showed that priming exertion and providing a reward led participants to squeeze significantly earlier and harder on a handgrip. Their results support goal setting’s theory’s contention that specific, high goals affect performance through effort. The present study builds on this research as it demonstrates that there is a linear relationship between the difficulty level connoted by a prime and task performance.

The practical significance for HRM-IR of this study is at least four-fold. Organizations should consider posting photographs that prime difficult goals, as they will likely yield higher performance than showing a photograph of an easy goal or showing no photograph. For example, in a negotiation context, priming a specific, difficult goal might have a positive influence on the negotiated outcome. These images can be placed on the walls of the workspace, on memos, and other documents that employees are exposed to in the workplace.

Second, the results of the experiments are particularly applicable to work settings that involve manual or physical labour. For example, photographs that connote difficult goals associated with certain levels of production may yield higher levels of performance for employees who work in manufacturing. Third, pictures that connote difficult goals associated with safety might positively influence employees in dangerous jobs to engage in safe behaviours.
Fourth, the results of this experiment also have practical significance for athletic settings. Coaches should consider the use of photographs that connote difficult goals to enhance the performance of athletes in training and in competition. The photographs may be placed in dressing rooms and in sports arenas.

**Limitations and Directions for Future Research**

A number of limitations of this study should be noted. First, this study was conducted in a laboratory. As such, the external validity of the study is limited. It is important to test the linearity hypothesis in this study in an organizational context. For example, how do primes that connote various difficult goals influence total sales made by employees.

A second limitation is that only one type of photograph was studied. It is important to determine whether difficult goals outside of weightlifting also influence performance. Do different pictures that connote difficult goals influence behaviour on all types of tasks? Are there photographs that inhibit performance?

A third limitation is the sample. The participants were male. In future research it is necessary to test the influence of subconscious goals that vary in difficulty level on females. For example, it is important to determine whether primes connoting various goal difficulty levels influence the performance of females.

Given the infancy of priming research in HRM-IR, an important avenue for future research is determining the various boundary conditions of priming research. This can be accomplished through both exact and conceptual replications. Replications might serve to identify boundary conditions.
Another avenue for future research would be to consider the application of priming context specific and difficult goals together. This study and the study by Latham and Piccolo (2012) reveal that specific and difficult goals in isolation influence performance. Given that goal setting theory suggests that goals need to be both specific and difficult, combinations that are most effective in terms of subconscious goals should be considered. For example, would a photograph of call center employees and a given difficult goal of the number of pledges be most effective in terms of influencing call center employees performance relative to a photograph of call center employees only or a photograph of the number of pledges received. The results of the present study suggest that a photograph of call center employees and a given difficult goal of the number of pledges would be highly effective.

Another tenet of goal setting theory is that goals need to be attainable in order to be effective. That is, if goals are set too high they will not yield high performance, as they are not motivating to individuals. This study did not consider the effect of unattainable subconscious goals. For example, would a photograph of a person lifting 1000 pounds have negatively influenced performance on the strength task.

Given that goal setting theory states that goals are effective because they increase persistence. For example, Huber (1985) found that participants with high consciously set goals worked longer to complete a maze than did those with moderate, easy or “do best” goals. Future research should consider the extent to which primes influence persistence. For example are there primes in the environment that would improve persistence during bargaining for a labour contract between union and management.

In further applying goal setting theory to the automaticity model, there are many questions regarding the application of mediators and moderators in goal setting theory to the
automaticity model. Given that feedback is an important moderator in goal setting theory, it is important to determine whether feedback influences the effectiveness of primes. Furthermore, commitment has been shown to influence the goal-performance relationship. In the context of priming, the question remains as to whether commitment influences the primed goal-performance relationship. Conducting research on the extent to which the mediators and moderators that are specified by goal setting theory apply to subconscious processes provides a framework to conducting future priming research on HRM relevant issues.

Research should also consider the various boundary conditions in priming research. For example how does culture influences results of priming research? In addition, how long are primes effective? The answers to these types of questions would also help to decrease the replicability problem as researchers would have a better understanding of the different mediators and moderators that are important in the relationship between subconscious goals and performance. Future research should also consider examining additional dependent variables that are organizationally relevant, such as improving outcomes during labour negotiations. In addition, since this study demonstrated that primes influence the physical strength of individuals, it would be important to consider other physical behaviours that primes may influence. For example, can certain photographs influence the speed at which employees perform their work?

The automaticity model describes the pursuit of a primed goal as ballistic (Hassin et al, 2009). Is it possible that this can have a negative effect on performance in that the effect of a prime might not be capable of being altered, cancelled, or reversed?

Setting a specific challenging conscious goal has been shown to create a strong situation and thus mask personality variables (e.g., Adler & Weiss, 1988; Seijts, Latham, Tasa, & Latham). At the present time it is not known whether the same is true for primed goals. Future
research should consider the extent to which trait activation theory (Tett & Burnett, 2003) applies to priming research. This theory states that personality traits are expressed as responses to trait-relevant situational cues. According to the theory, the variance in trait-expressive behavior is maximized in “weak” situations. In “strong” situations, extrinsic rewards overpower individual differences in intrinsic rewards associated with trait expression. Trait relevant cues and the strength of the situation are both important. The automaticity model (Bargh, 2006) proposes that (1) goals are present in memory in the same way as trait concepts and stereotypes because of the frequency/consistency principles, and (2) just as trait concepts and stereotypes are automatically activated by features of the environment, so too are goals. As noted earlier, Shantz and Latham (2009), Latham and Piccolo (2012), and Chen and Latham (in press) showed that primes activate achievement motivation.
References


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between primed subconscious goals, assigned conscious goals, and task performance.

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Tables

Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean (lbs)</th>
<th>Standard Deviation (lbs)</th>
<th>95% Confidence Interval</th>
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</thead>
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<tr>
<td>Control</td>
<td>2.93</td>
<td>1.37</td>
<td>2.45</td>
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<tr>
<td>20 pound weight</td>
<td>2.73</td>
<td>1.02</td>
<td>2.35</td>
</tr>
<tr>
<td>200 pound weight</td>
<td>2.91</td>
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<tr>
<td>400 pound weight</td>
<td>3.54</td>
<td>0.96</td>
<td>3.18</td>
</tr>
</tbody>
</table>
Figures

Figure 1: Linear Relationship between Primed Goal and Task Performance
Appendices

Appendix 1: Word Search

APARTMENT
BANANA
BINDER
CAKE
CHOCOLATE
DOG
FLOWER
LAMP
LIST
ORANGE
PENCIL
PURPLE
STOVE
STRAWBERRY
TELEVISION
WINDOW
Appendix 2: Primes