

Toward an Integration of Goal Setting Theory and the Automaticity Model

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Two laboratory experiments were conducted to assess the extent to which goal setting theory explains the effects of goals that are primed in the subconscious on task performance. The first experiment examined the effect on performance of three primes that connote the difficulty levels of a goal in the subconscious. Participants ($n = 91$) were randomly assigned to one of three conditions where they were primed with either a photograph of a person lifting 20 pounds (easy goal), 200 pounds (moderately difficult goal), or 400 pounds (difficult goal). Following a filler task, participants were asked to “press as hard as you can” on a digital weight scale. Participants who were primed with the difficult goal exerted more effort than those who were primed with the moderate or easy goal. The second experiment examined whether choice of goal difficulty level can be primed. Participants ($n = 133$) were randomly assigned to one of two conditions. Those primed with a difficult goal consciously chose to set a more difficult goal on a brainstorming task than those who were primed with an easier goal. Similarly, their performance was significantly higher. Conscientiousness moderated the subconscious goal–performance relationship while the self-set conscious goal partially mediated the subconscious goal–performance relationship.

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The authors thank John Bargh, E.A. Locke, and Alex Stajkovic for their constructive comments on an earlier version of this manuscript. Funding for conducting this research was provided by a grant to the first author and a Postdoctoral Fellowship to the second author from the Social Sciences and Humanities Research Council, Canada.

INTRODUCTION

The automaticity model (Bargh, 1990) states that goals that are primed are unintentional and relatively effortless cognitively. They run to completion once started without any conscious direction or guidance. The main advantage of a primed goal over one that is consciously set lies in freeing an individual's limited conscious capacity from many burdens, and thus improving the efficiency with which an individual can cope with a complex and ever-changing environment (Hassin, Bargh, & Zimmerman, 2009).

The priming of goals in general, and Bargh's (1990) automaticity model in particular, has recently provoked both debate and skepticism within the fields of social and cognitive psychology (Doyen, Klein, Pichon, & Cleeremans, 2012; Molden, 2014; Pashler & Harris, 2012; Pashler & Wagenmakers, 2012). Dijksterhuis, van Knippenberg, and Holland (2014) have gone so far as to argue that this research domain is under siege. This is because of the ongoing questions that have been raised as to whether the primed goal-performance relationship is "real" or whether the effect is too fragile to be considered meaningful. Most importantly, the model lacks a theoretical framework for predicting and explaining primed goal-behavior relationships, and research on the model has failed to identify mediators that explain the relationship (Cesario, 2014; Dijksterhuis, 2014; Locke, 2015). To date, priming has only evolved into a technique to study the sundry behavioral effects of activating a mental representation of a goal in the absence of awareness.

The purpose of the present paper was to determine whether goal setting theory (Locke & Latham, 1990, 2002) can provide a theoretical framework for understanding the effects of subconscious goals that are primed on subsequent task performance. A brief review of the automaticity model and goal setting theory are provided, and their similarities are pointed out. This review is followed by two empirical experiments, one on the results of priming effort and the other on priming the conscious choice of a goal, two mediators in goal setting theory (Locke & Latham, 1990; Latham & Locke, in press).

PRIMING AND THE AUTOMATICITY MODEL

Priming began as an experimental technique to show how information is stored in memory despite the individual's inability to recall it (Bargh, 2014; Koriat & Feuerstein, 1976). The term refers to the facilitative effect of a stimulus in the environment that activates stored knowledge, in the absence of awareness, whenever the situation allows (Higgins, 1996). For this reason, Latham, Stajkovic, and Locke (2010) argued for the use of the term subconscious rather than unconscious or preconscious. Automaticity refers to a lack of awareness that a mental representation stored in memory has been

activated, lack of conscious intention to initiate it, and the inability to control it once initiated (Bargh, 1989, 1990).

Similar to goal setting theory, Bargh's (1990, p. 100) automaticity model was developed inductively. The model states that:

Goals and intents are represented in the mind in the same fashion as are social constructs, stereotypes, and schemas . . . Just as other chronically accessible social representations do, then, chronic goals and intents, and the procedures (Smith 1984) and plans (Miller et al., 1960; Wilensky, 1983) associated with them, may become directly and automatically linked in memory with representations of environmental features to which they are frequently and consistently associated . . . The result of this automatic associative link is that the motive-goal-plan structure becomes activated whenever the relevant triggering situational features are present in the environment.

GOAL SETTING THEORY

Among the core findings of research on goal setting theory (Latham & Locke, in press; Locke & Latham, 1990, 2002, 2013) is that a specific, high goal leads to higher task/job performance than a specific, easy goal, a vague goal such as to do one's best, or no goal. Moreover, the theory asserts that there is a linear relationship between degree of goal difficulty and performance (Locke, 1968, 1982; Locke & Latham, 1990).

Among the moderators specified by the theory is ability including knowledge and skills necessary to perform a task. Ability is defined as the requisite knowledge/skill to perform a task. The theory, inductively derived from empirical research, shows that when individuals reach the limits of their ability at high goal difficulty levels, performance levels off (Locke, 1966, 1967, 1968, 1982; Locke, Mento, & Katcher, 1978; Locke, Chan, Harrison, & Lustgarten, 1989). Note that in each of these experiments, there were no situational constraints, a moderator variable in goal setting theory, preventing participants from attaining the goal.

The explanation for the effect of goal difficulty on task performance is that a high goal leads to greater effort and persistence to attain it than an easier goal. Effort and persistence are mediators in goal setting theory.

Choice is a third mediating variable in this theory in that it affects the direction of behavior. A person can choose to set a specific goal, or to set a vague goal, or to set no goal and meander. If a person chooses to set a specific goal, this person also chooses the difficulty level of that goal.¹

¹ The fourth mediator in goal setting theory is task strategy.

The core findings of this theory are derived from approximately 400 studies involving 40,000 participants who performed one of 88 different tasks (Locke & Latham, 1990, 2002).

INTEGRATING GOAL SETTING THEORY AND THE AUTOMATICITY MODEL

Goal setting theory (Locke & Latham, 1990, 2002) emphasises the importance of the goal to an individual in order to ensure goal commitment, a moderator variable. Similarly, the automaticity model emphasises that environmental stimuli only cue a mental representation of a goal that is relevant or important to the individual (Molden, 2014; Weingarten, Chen, McAdams, Yi, Hepler, & Albarracín, 2016). The goal must be judged, albeit subconsciously, as valued; thus a primed goal only activates behavior when it is congruent with an individual's values (Higgins & Eitam, 2014). Similarly, goal setting theory states that values are the antecedent of goals that are self-set. In short, the automaticity model states that whether a mental representation stored in memory is activated depends on its motivational relevance for an individual and how much control (i.e. situational resources/constraints) a person has over the environment (Aarts, Custers, & Veltkamp, 2008; Higgins & Eitam, 2014).² Situational resources/constraints, as previously noted, is a moderator in goal setting theory. Finally, the automaticity model asserts that once activated, a goal that has been primed operates in the same way as a consciously set goal (Bargh, Gollwitzer, & Oettingen, 2010). A primary difference between these two perspectives is that a goal that has been primed guides an individual's behavior in the absence of awareness or conscious intention (Bargh, Gollwitzer, Lee-Chai, Bamdollar, & Trotschel, 2001).

Empirical Evidence Linking the Automaticity Model with Goal Setting Theory

To test the assertion that being aware–unaware is the primary distinction between a consciously set and a goal that has been primed in the subconscious, Stajkovic, Locke, and Blair (2006) conducted a laboratory experiment involving a brainstorming task. They found additive effects for a specific, high conscious goal and a goal that was primed. In a field setting, Shantz and Latham (2009) also obtained main effects for the two types of goals on the job

² These assertions are consistent with Hollenbeck, Williams, and Klein's (1989) research. They found that both valence and expectancy influence goal choice and commitment. Motivational relevance as defined in the automaticity literature would appear to be related to valence, that is, value, worth, importance. Control, as referred to in the automaticity literature, would appear to be related to expectancy, that is, the subjective probability that effort leads to desired performance.

performance of call center employees during a 3-hour work shift. They subsequently conducted two exact replications in two additional call centers and obtained the same results for the primed goal (Shantz & Latham, 2011). A meta-analysis of the data from all three call centers was also 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).

Goal setting theory emphasises the importance of goal specificity. Thus, Latham and Piccolo (2012) conducted a field experiment in a fourth call center to test whether a goal primed in the subconscious that is context specific to the work that is to be performed leads to a significant increase in job performance over a 4-day work week 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 organisation. Those who saw a photograph of people calling donors raised 16 per cent more money than the employees who viewed a photograph of a racer, and 85 per cent more than those in the control group. Those who saw the photograph of the racer raised 60 per cent more money than those in the control group. The practical significance of these findings, and the duration of the effect (i.e. 4 days) relative to findings in this domain in social psychology (e.g. seconds/minutes; Bargh, Chen, & Burrows, 1996) suggest that the effects of subconscious goals on performance are anything but fragile.

Goal setting theory (Locke & Latham, 2013) states that when people lack the knowledge or skill to perform a task, a learning goal rather than a performance goal should be set. The former focuses attention on the discovery of an effective task strategy, a mediator in goal setting theory. The latter focuses attention on a desired level of performance (e.g. dollars generated) (Winters & Latham, 1996; Seijts & Latham, 2005).

Chen and Latham (2014) conducted a laboratory experiment to examine the effects of priming a learning goal, a performance goal, and both a learning and a performance goal on a task that requires an individual to acquire the knowledge/skill to perform it effectively. The prime for the performance goal was the photograph of the racer that had been used by Shantz and Latham (2009, 2011) and Latham and Piccolo (2012). The prime for the learning goal was a photograph of Rodin's "The Thinker". The results of that experiment are consistent with those conducted by Winters and Latham (1996) who had used the same complex task to assess the effectiveness of consciously set learning and performance goals. A significant main effect on performance was obtained only for the primed learning goal. In summary, these experiments on the priming of goals in the subconscious support a central argument of the automaticity model, namely, that the primary difference between a consciously set

goal and a goal that is primed on task performance is that in the former instance people are aware of the goal, and hence are aware of their behavior while pursuing it. Both types of goals, the model states, yield similar performance outcomes (Bargh et al., 2010; Chartrand & Bargh, 1996).

Despite these preliminary findings supporting the use of goal setting theory as a framework for testing the automaticity model, a central tenet of the theory has yet to be tested with regard to the priming of goals, namely the linear relationship between the difficulty level of the goal and task performance (Locke & Latham, 1990, p. 27). This aspect of the theory is derived from an empirical function based on the results of 12 separate studies (Locke, 1968). In all cases, the functions were shown to be linear except when the participants reached the level of their ability at high goal difficulty levels. In those cases, the function levelled off. When the goal level was far beyond their capacity, the goal-performance relationship was curvilinear (Locke, 1982). Consequently, hypotheses deduced from goal setting theory were tested. The first experiment examined whether, given ability, in this instance physical strength, there is a linear relationship between the difficulty level connoted by a goal primed in the subconscious and task performance. The second experiment was conducted to test whether the difficulty level of the goal that is primed influences the choice of a consciously set goal, and subsequent task performance.³ As noted previously, effort and choice are mediators in goal setting theory (Locke & Latham, 1990, 2002).

PILOT STUDY

Based on current theorising (e.g. Strack & Deutsch, 2004), priming activates concepts that spread attention to other concepts that are episodically linked (e.g. weightlifting-effort/achievement). Thus priming is said to influence behaviors based on concepts whose activation potential has been increased. However, as Stroebe and Strack (2014) noted, even though an experimenter has control over the selection of a prime, this is not necessarily the case for the concept it activates. Thus a pilot study was conducted to determine whether a photograph of a weightlifter primes the mental representation of “effort/achievement”. A projective test was used whereby participants wrote stories about one of two pictures (Schultheiss & Pang, 2007). This procedure is similar to that carried out by Chen and Latham (2014), Latham and Piccolo (2012), and Shantz and Latham (2009, 2011). The pilot test was necessary because the

³ As noted earlier, goal setting is an inductively derived theory. Empirical research revealed that effort mediates the goal-performance relationship (Locke & Latham, 1990, 2002). The dependent variable used in the first experiment, physical strength exerted, equates effort/performance.

photograph of the weightlifter might be priming concepts in memory that are irrelevant to effort.

METHOD

Participants and Method

Participants ($n = 97$, 63% male), recruited through CrowdFlower, wrote their stories on the online data collection tool, Qualtrics. They did so in exchange for a monetary payment.

Participants were randomly assigned to the experimental condition where they wrote a story about the weightlifter attempting to lift 400 pounds ($n = 41$), or to the control condition where they wrote a story about the photograph of a rock ($n = 56$).

All participants read the following instructions presented to them on their computer screens: “*This is a test of the imagination. Please look at the above picture carefully. Your task is to write ONE complete story about the picture—an imaginative story with a beginning, a middle, and an end. Try to describe the situation, what led to the situation, and how everything turned out in the end. Write your thoughts as they come to your mind. Don’t worry about grammar, spelling, or punctuation. You have 7 minutes to complete this task.*”

To ensure objectivity in the scoring of the stories, and consistent with Shantz and Latham (2009), word imageries related to a primed goal for effort were measured using a text analysis program, the Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001). LIWC is a word-count software application that is able to identify words under categories such as social memberships and processes, affective/emotional, sensory/perceptive, and cognitive mechanisms. Each LIWC dimension of words is part of an extensive dictionary that is composed of approximately 4,500 words and word stems (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007).

LIWC 2007 does not have a measure of effort, hence one was created. The dictionary consisted of eight words that have been identified to be synonymous with effort. The words and word stems include effort*, try, attempt*, exert*, strive*, and expand*. We examined the sum of the effort-related words compared to all the words written for both images.

Results

Independent sample two-tailed t -tests were conducted to compare the implicit motive for effort between those who were primed with the photograph of the weightlifter ($M = 0.21$, $SD = 0.39$) and those in the control condition who saw the photograph of a rock ($M = 0.04$, $SD = 0.23$). The difference between the

two conditions in the use of effort-related words was significant, $t(60) = 2.40$, $p < .02$.

EXPERIMENT 1

Supraliminal priming involves the subtle, unobtrusive activation of a relevant mental presentation by an external stimulus, such that an individual is aware of the stimulus but is unaware of its influence on his or her behavior (Bargh & Huang, 2009). The external stimulus in this experiment was a photograph of a weightlifter. The hypothesis tested was as follows:

Given ability, specifically physical strength, there is a linear relationship between the difficulty level of a subconscious goal and task performance.

METHOD

Participants

The experiment was conducted in a laboratory in a large Canadian business school. The initial sample included 91 males between the ages of 18 and 46 ($M = 22.6$, $SD = 4.68$) who were randomly assigned to one of three conditions. The dependent variable was how hard they pressed down on a digital food scale. This dependent variable was chosen because it is an objective measure of effort that is under each participant's control, and thus is relatively uncontaminated by other factors.

Procedure

The participants sat at a desk where they were asked to complete a word search puzzle for five minutes. This task, "a filler", was used to minimise the probability of a participant recognising the hypothesised relationship between a prime and performance on the strength task. The word search only contained neutral words (e.g. dog, strawberry, window, chocolate, pencil, purple). In the top right corner of the document of the word search appeared one of the three primes. The purpose of the primes was to arouse an easy, moderately difficult, or a difficult performance goal in the subconscious. In the first condition, there was a photograph of a person attempting to lift 20 pounds. Similarly, in the second condition, there was a photograph of a person attempting to lift 200 pounds (see Figure 1). Likewise, in the third condition, there was a photograph of a person attempting to lift 400 pounds.

These weights were chosen based on the performance of Olympic weightlifters. Weightlifters in the Olympics typically lift, on average, 568 pounds (International Weightlifting Federation, 2014). As such, a goal of 400 pounds



FIGURE 1. Goal difficulty prime.

is specific and very difficult for lay people, 200 pounds is moderately difficult, and 20 pounds is relatively easy. After completing the filler task, each participant was asked to “press as hard as you can with your little finger on this 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 their awareness of the purpose of this experiment. The questionnaire was developed by Bargh and Chartrand (2000) and used by Shantz and Latham (2009, 2011), Latham and Piccolo (2012), and Chen and Latham (2014): (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?” and (4) “When you were pressing on the scale, did you notice anything unusual?” After completing the awareness check, the participants were debriefed by a researcher.

RESULTS

Awareness

The check for awareness revealed that three participants were aware of the purpose of the experiment. Another participant did not complete the awareness check. Hence four people were dropped from the data analysis. The remaining participants did not show any awareness of the purpose of this experiment based on their written answers to the funnelled debriefing questions. Typical responses to the first question, regarding the purpose of the experiment, included: “No idea”, “Unsure”, and “The relationship between physical energy and concentration”. Answers to the second question regarding what participants thought the experiment was trying to uncover included: “I don’t know”, “Concentration”, “Ability to find words”, and “Whether performance on the 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

TABLE 1
Experiment 1: Descriptive Statistics

<i>Condition</i>	<i>Mean grams (of pressure on digital food scale)</i>	<i>Standard Deviation</i>	<i>95% Confidence Interval</i>	
20 pound weightlifter	2.73	1.02	2.35	3.11
200 pound weightlifter	2.91	1.20	2.46	3.36
400 pound weightlifter	3.54	0.96	3.18	3.23

word search”. Finally, when asked whether they noticed anything unusual when pressing on the scale, typical answers included: “No” and “I found myself using a lot of concentration”.

Hypothesis

The number of participants who saw the photograph of the person lifting 400 pounds, 200 pounds, and 20 pounds was 31, 30, and 30, respectively. Differences in task performance between the three primed conditions were significant [$F(2, 90) = 4.75, p = .01$]. Planned independent two-tailed t -tests indicated that participants who saw the photograph of the person lifting 400 pounds ($M = 3.54, SD = 0.96$) pushed significantly harder than those who saw the photograph of the person lifting 200 pounds ($M = 2.91, SD = 1.20, t(58) = 2.23, p < .05$); they also pushed significantly harder than those who saw the photograph of the person lifting 20 pounds ($M = 2.73, SD = 1.02, t(59) = 3.16, p < .01$) (see Table 1). The correlation between the difficulty level of the goal that was primed and task performance (effort) was also significant [$r = 0.30, p < .01$].

To further examine whether there is a linear relationship between the difficulty level connoted by a prime and performance on the task, a trend analysis was conducted. As the spacing between the goal difficulty primes was not equal (20 pounds, 200 pounds, and 400 pounds), we constructed sets of trend coefficients appropriate for the actual spacing of the primes. The process described by Keppel and Wickens (2004, pp. 80–81, 105) was used to determine the coefficients for unequal intervals. Specifically, the appropriate coefficients for the spacing between the goals, sensitive to the particular pattern of the three primes, were selected. The coefficients 10, 100, and 200 were chosen as they are equal to the spacing between the goals connoted by the primes, namely, 20, 200, and 400 pounds. The average of the three coefficients is expressed as $^{310}/3$. According to Keppel and Wickens (2004), the next step is to subtract the average from each of the coefficients. As such, the linear coefficients are $\{-^{280}/3, -^{10}/3, ^{290}/3\}$. To convert the fractions into integers each coefficient was multiplied by 3. Finally, the values entered into the linear weighted contrasts were

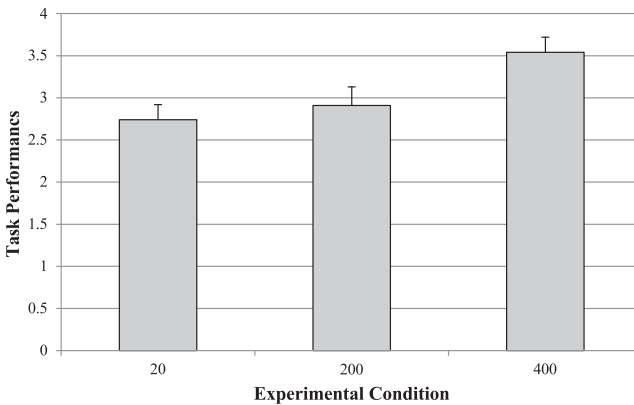


FIGURE 2. Relationship between goal difficulty level connoted by a primed goal and task performance.

{-280, -10, 290}. As shown in Figure 2, the results revealed that there is a significant linear relationship between the difficulty level connoted by the three primes and subsequent task performance [$F(1, 90) = 8.61$ $p < .01$]. Therefore, the hypothesis was supported.⁴

Discussion

Locke and Latham (2004, p. 395) have called for research on “subconscious as well as conscious motivation and the relationship between them”. The present results show that, as is the case with consciously set goals, within the limits of ability (e.g. Locke, 1967, 1982) there is a linear relationship between the difficulty level of a subconscious goal that is primed and task performance. Individuals performed better following exposure to a prime that connoted a great deal of effort than they did for an easier one. Effort, as noted earlier, is a mediator in goal setting theory that explains the goal–performance relationship. As Bargh and colleagues (e.g. Bargh et al., 2010) have repeatedly stressed in describing the automaticity model, goals that have been primed in the subconscious and goals that are set consciously have similar effects on an individual’s behavior.

The practical significance of this experiment is at least two-fold. First, the finding that the difficulty level connoted by a prime can influence a physical response suggests its usefulness in work settings that involve physical labor. For example, photographs that activate a difficult goal in the subconscious might prove useful in the forest products and mining industries where physical

⁴ The quadratic component of the H1 test was not significant [$F(1, 90) = 0.89$, $p = .35$].

effort is required for increasing productivity. Second, the present findings suggest the use of primes that activate difficult goals in the subconscious for enhancing the performance of athletes in physical training and in competition.

EXPERIMENT 2

Choices are integral and indispensable in motivational analyses of behavior because they account for the choice to set a goal, its difficulty level, and the effort expended to attain it (Elliott & Niesta, 2009). The first experiment only demonstrated the relationship between the difficulty level of a goal primed in the subconscious and the subsequent effort expended on the task. The conscious choice of a goal following a prime was not examined, nor were the possible mediators or moderators of the effect of a subconscious goal on performance.

The purpose of the second experiment was to determine whether it is possible to prime a goal in the subconscious through an external cue in the environment, in the absence of an individual's awareness, that influences the conscious choice of the difficulty level of a goal and subsequent performance. As previously noted, both types of goals, subconscious and conscious, are important in work settings because a goal primed in the subconscious and a consciously set specific, difficult goal have been shown to have additive effects on performance (e.g. Shantz & Latham, 2009). What is not known is whether a goal that has been primed can influence the choice of a consciously set, specific goal that in turn increases performance. This is an important issue because many people may consciously favor an easier goal to one that is hard. Priming a difficult goal might alleviate the problem.

In addition to a failure to identify mediators, the automaticity model has been criticised for a failure to examine possible moderators (Cesario, 2014; Locke, 2015; Molden, 2014). The identification of moderators is important because they explain the boundaries within which a causal effect occurs, and hence why an attempt to replicate a causal effect is likely to be successful/unsuccessful.

Latham and his colleagues (Chen & Latham, 2014; Latham & Piccolo, 2012; Shantz & Latham, 2009), in using the Thematic Apperception Test (Morgan & Murray, 1935), a projective measure, found that the primes they used aroused the implicit need for achievement. However, this need did not mediate or moderate the causal relationship between the goal primed in the subconscious and task performance. Thus, it may be that conscious rather than subconscious processes both explain and moderate the effect of a goal that has been primed on task performance. That is, the goal in the subconscious may affect the choice of a consciously set goal, and it is this choice of a self-set goal that influences performance.

Similarly, a self-report measure of achievement rather than a projective measure may be a moderator of the primed goal–performance relationship. Higgins and Eitam (2014) have stressed that the effectiveness of a primed goal is moderated by its motivational relevance for an individual. Thus conscientiousness was measured in this experiment because it has been found to moderate the relationship between consciously set goals and task performance (Latham, Ganegoda, & Locke, 2011; Williams, 2013). This is because conscientious individuals are achievement oriented which predisposes them to set high goals (Barrick, Mount, & Strauss, 1993; Hollenbeck & Williams, 1987). The effect of a self-report personality measure on a goal that has been primed in the subconscious has yet to be investigated.

Four hypotheses, derived from goal setting theory, were tested in the present experiment.

1. A difficult goal primed in the subconscious leads to the choice of a higher self-set goal than one that is chosen when an easier goal is primed in the subconscious.
2. A difficult goal primed in the subconscious leads to higher performance than is the case when an easier goal is primed in the subconscious.
3. The self-set goal mediates the subconscious goal–performance relationship.
4. The subconscious goal–performance relationship is strengthened by conscientiousness, a self-report measure of personality. This hypothesis is based on empirical research that shows that employees who are more conscientious set and commit to higher goals than employees who are less conscientious (Barrick et al., 1993; Latham et al., 2011).

METHOD

Participants

Participants ($n = 133$) were undergraduate students at a major Canadian business school. All participants received half a course credit for participating in the study. Fifty-seven per cent of the participants were women, 42.9 per cent were East Asian, 24.8 per cent were Caucasian, while the remaining 32.3 per cent were Southeast Asian, Middle Eastern, or of mixed ethnicity. Their average age was 19.75 ($SD = 2.49$).

Procedure

The participants were randomly assigned to one of two experimental conditions based on level of primed goal difficulty, namely, (1) easy ($n = 68$) and (2)

high ($n = 65$). A moderate goal difficulty condition was not included in this second experiment because we were solely interested in whether the conscious choice of a difficult goal could be primed, and we wanted to increase our statistical power by having two rather than three conditions. All participants answered demographic questions and a personality measure before choosing a goal and then completing a brainstorming task. At the end of the experiment, a manipulation check was conducted to determine if a participant was aware of the purpose of this experiment.

Priming Goal Choice. Prior to the brainstorming task, participants were exposed to one of two photographs that were located at the top of their computer screen. Based on the experimental condition, participants saw a weightlifter attempting to lift 20 pounds (easy goal) or 400 pounds (difficult goal). As in Experiment 1, these weights were chosen by the experimenters based on the performance of Olympic weightlifters who, on average, lift 568 pounds (International Weightlifting Federation, 2014).

Choice of Goal Difficulty. The participants were asked to set a goal for the number of arguments they could generate in support of the statement: "Higher education is relevant to the development of society". Once they set the goal, participants were given 10 minutes to complete the brainstorming activity.

Measures

Personality Inventory. Conscientiousness was measured using the Ten Item Personality Inventory (TIPI) (Gosling, Rentfrow, & Swann, 2003). This test assesses achievement/industriousness (Barrick & Mount, 1991; Costa & McCrae, 1992). The test-retest reliability of the subscale that assesses conscientiousness has been found to be satisfactory (mean $r = 0.76$) (Gosling et al., 2003). The inventory asks participants how well each pair of traits (e.g. dependable/self-disciplined) describe them. Each pair of traits is rated on a 7-point Likert-type scale.

RESULTS

Checking for Awareness

Consistent with previous experiments on the automaticity model, a modified version of Bargh and Chartrand's (2000) open-ended funnel debriefing questionnaire was used to assess a participant's awareness of the purpose of this experiment: (1) "What do you think was the purpose of this experiment?" (2) "Did you think that any of the tasks you did were related in any way? If yes, in

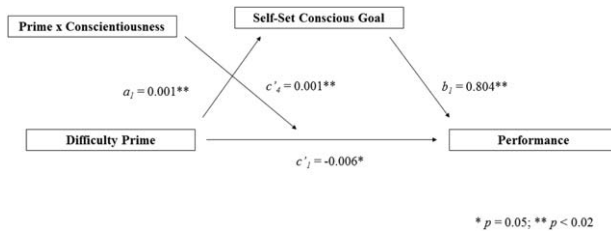


FIGURE 3. Mediation of self-set conscious goals and moderation of conscientiousness on the primed difficulty goal–performance relationship.

what way were they related?” and (3) “When you were completing the tasks, did you notice anything unusual?” The typical answers to the first question were: “I don’t know”, “To see how we value education,” and “To assess why we think education is important”. In response to the second question, participants answered “No”. When answering the third question, four participants identified the correct relationship between the prime and the brainstorming task.

These four participants were excluded from the data analyses.

Choice of Goal Difficulty Level and Task Performance

Participants who saw the photograph of the person lifting 400 pounds subsequently chose to set significantly higher goals ($M = 2.94$, $SD = 1.27$) than those who saw the photograph of the person lifting 20 pounds ($M = 2.43$, $SD = 0.95$) ($t(131) = 2.64$, $p < .01$, $d = 0.45$). In addition, those exposed to the more difficult prime also produced more arguments ($M = 4.11$, $SD = 2.31$) than those who were exposed to the easier prime ($M = 3.35$, $SD = 1.35$) ($t(101) = 2.29$, $p < .03$, $d = 0.40$). Thus support was obtained for the first two hypotheses.

Mediator and Moderator Analyses

The mediator and moderator analyses were conducted using the PROCESS Model 5 macro for SPSS (Hayes, 2013) with 5,000 bootstrap resamples. This was done to determine whether the conscious goals that were self-set mediated the relationship between the subconscious goal and performance on the brainstorming task (see Figure 3). Model 5 is a conditional process analysis in which X (difficulty prime) exerts its effect on Y (performance) indirectly through M (self-set conscious goals), independent of any other variable, but also directly, with the magnitude of the direct effect being dependent on W (conscientiousness). Ethnicity was controlled (Hayes, 2013) (see Table 2).

TABLE 2
Experiment 2: Mediation and Moderation Statistics: PROCESS Model 5

		<i>M (Goal)</i>			<i>Y (Performance)</i>			
		<i>Coeff.</i>	SE	p	<i>Coeff.</i>	SE	p	
<i>X (Prime)</i>	<i>a1</i>	0.002	0.001	.01	<i>c'1</i>	-0.006	0.003	.05
<i>M (Goal)</i>					<i>b1</i>	0.791	0.128	<.001
<i>W (C)</i>					<i>c'2</i>	-0.098	0.157	.53
<i>XW (Prime × C)</i>					<i>c'4</i>	0.001	0.001	.02
Constant	<i>i1</i>	2.145	0.211	<.001	<i>i2</i>	1.763	0.804	.03
Control (Ethnicity)		0.063	0.038	.09		0.034	0.056	.54
		$R^2 = 0.070$				$R^2 = 0.323$		
		$F(2, 129) = 4.816, p = .01$				$F(5, 126) = 12.040, p = .00$		

The goal primed in the subconscious was a significant and positive predictor of performance ($b1 = 0.791, p < .001$). The effect of the subconscious goal on overall performance was significant when the self-set goals were controlled ($b = -0.006, p = .05$). The confidence interval produced by an indirect effect test using the PROCESS macro (Hayes, 2013) supports partial mediation of the goal set on performance as it does not include zero [CI 95%overall = (-0.0119, -0.0001), 5,000 bootstrap resamples].

Conscientiousness (C) moderated the relationship between subconscious goal difficulty and performance on the brainstorming task ($c'4 = 0.001, p = .02$). Inspection of the simple effects revealed that for participants who scored higher in conscientiousness (scores 1 *SD* above the mean), the more difficult prime led to higher performance ($B = 0.0028, SE = .0011, 95\% CI = [.0006, .005], t = 2.48, p = .02$). However, participants lower in conscientiousness (scores 1 *SD* below the mean) showed no difference in performance between prime levels ($B = -.0009, SE = .0011, 95\% CI = [-.003, .0012], t = -.82, p = .42$).

Performance as a Function of Conscientiousness and Goal Setting

We conducted a median split on conscientiousness and on self-set goals. Median splits are an acceptable technique as long as the correlation between the experimental factor and the median split variable is not significant (Iacobucci, Posavac, Kardes, Schneider, & Popovich, 2015a, 2015b). In the present study, the correlation between the experimental variable and the median split variable is not significant ($r = 0.13, p = .14$).

We used the two median split variables to create a third variable in which participants were either relatively high in both conscientiousness and self-set

goals or fell into another combination of the two median split variables. Four groups were created when we included the prime for difficulty. The four groups were: (1) difficult prime and relatively high score on conscientiousness and the self-set goal; (2) difficult prime and a relatively lower score on conscientiousness and a self-set goal, (3) easy prime and a relatively high score on conscientiousness and the self-set goal; and (4) easy prime and a relatively lower score on conscientiousness and the self-set goal.

A series of planned two-tailed independent *t*-tests revealed that those who were in the difficult prime condition scored relatively high on conscientiousness and chose a relatively high goal out-performed ($M = 5.46$, $SD = 2.77$) participants who were primed with a difficult subconscious goal, did not score relatively highly on conscientiousness, and chose a relatively easy goal ($M = 3.32$, $SD = 1.56$) ($t(63) = 3.99$, $p < .001$), as well as those participants who were exposed to an easy prime and scored relatively highly on conscientiousness, and chose a relatively high goal ($M = 3.65$, $SD = 1.22$) ($t(39) = 2.52$, $p < .02$), and participants who were primed with an easy goal and did not score relatively highly on conscientiousness, and chose a relatively easy goal ($M = 3.25$, $SD = 1.38$) ($t(73) = 4.63$, $p < .001$). In short, participants who scored relatively highly on conscientiousness and chose to set a relatively high goal ($M = 4.71$, $SD = 2.41$) performed 43.60 per cent better than the participants who did not score relatively highly on these two variables ($M = 3.28$, $SD = 1.46$) ($t(53) = 3.51$, $p < .01$). No other performance comparisons among the four groups were significantly different.

Discussion

Support was found for all four hypotheses. First, an individual's conscious choice of the difficulty level of a specific goal to set was affected by the difficulty level of the goal that was primed in the subconscious. Second, this in turn led to higher task performance. This result provides support for a primary contention of the automaticity model, namely, that a goal that is primed in the subconscious affects behavior in the same way as a consciously set goal. As is the case with a consciously set goal, a prime that connotes a difficult level of performance leads to higher performance than a prime that connotes easy performance. Their only difference is the unawareness/awareness of the goal-performance relationship (Chartrand & Bargh, 1996).

Consistent with goal setting theory, when primed with a difficult goal, participants chose higher goals and performed better on a follow-up task than those who were primed with an easy goal. In this regard, goal setting theory removes a void in the automaticity model by providing a theoretical framework for conducting research on the effects of goals primed in the subconscious on cognition and behavior.

The subconscious goal–performance relationship was partially mediated by the choice of the conscious goals that were self-set. This supports the notion that subconscious goals and consciously set goals work together to influence task performance. A subconscious goal influences the conscious choice of an easy/difficult goal. It is the self-set difficult goal, resulting from a goal primed in the subconscious, that leads to high performance.

Support was found for the fourth hypothesis that conscientiousness, a self-report measure of achievement, moderates the subconscious goal–performance relationship. Those who were primed with a more difficult goal, and scored relatively higher on conscientiousness, performed better on the brainstorming task than the participants who did not do so. This finding is consistent with previous studies on goal setting theory that show that individuals who are conscientious are more likely to set higher goals and attain higher performance than those who score low on this trait (Barrick et al., 1993; Latham et al., 2011).

OVERALL DISCUSSION

As noted earlier, the automaticity model (Bargh, 1990), developed and tested primarily in social psychology, has been criticised for its lack of a theoretical framework. Goal setting theory (Locke & Latham, 1990), developed and tested primarily in industrial-organisational psychology, has been criticised for ignoring the subconscious (Locke & Latham, 2004). The results of the present two experiments and the research conducted earlier on the effect of subconscious goals on task performance suggest the viability of integrating the automaticity model with goal setting theory. That is, goal setting, with its mediators and moderators, may provide a theoretical framework for the automaticity model, and the automaticity model may fill the void in goal setting theory with regard to goals in the subconscious. The research from industrial-organisational psychology supporting this contention is as follows:

Both the automaticity model and goal setting theory emphasise that for goal pursuit to occur, the situation must facilitate it and the goal must be valued by the individual. Consistent with goal setting theory, a context-specific goal that is primed in the subconscious leads to higher performance than a prime that is more general (Latham & Piccolo, 2012). A learning goal primed in the subconscious leads to higher performance than a performance goal primed in the subconscious on a knowledge acquisition task (Chen & Latham, 2014). Effort, a mediator in goal setting theory, can be primed, and an increase in effort leads to an increase in performance.

Given ability, there is a linear relationship between the difficulty level of the goal that is primed in the subconscious and task performance. The more difficult the goal primed in the subconscious, the higher the goal that is consciously chosen. A conscious self-set goal partially mediates the subconscious goal–

performance relationship. A self-report measure of conscientiousness moderates the subconscious goal–performance relationship.

In summary, the results of these two experiments coupled with the results of the previous priming experiments in industrial-organisational psychology show that in every instance the subconscious goal–performance relationship, consistent with the automaticity model, is similar to that which has been found in experiments on consciously set goals. In every instance, hypotheses, derived from goal setting theory, on the causal effect of a subconscious goal on performance have been supported.

Miner (2008) has argued that the understanding and influencing of employee motivation will not be complete until subconscious processes are systematically explored. Consistent with his assertion, Locke and Latham (2004; Latham & Locke, in press) have noted that a limitation of goal setting theory is that it fails to take into account the subconscious. The findings from the present two experiments suggest that the automaticity model can fill this void in goal setting theory. Filling the void is important because in contrast to the limits of focal awareness (Anderson, 1993; Hassin et al., 2009; Miller, 1956), the subconscious is a vast store-house of information (Higgins, 1996). The automaticity model (Bargh, 1990) would appear to alleviate this limitation of goal setting theory if the mediators and moderators of a consciously set goal are found to be the same as those for a primed goal. Similarly, the “siege” of the literature on priming would be alleviated if goal setting theory and its mediators explain the causal effect of goals that have been primed in the subconscious on task performance.

LIMITATIONS AND FUTURE RESEARCH

To determine the external validity of the present findings, a conceptual replication is needed where the research is conducted in different work settings, with different types of employees performing different types of tasks. The external validity of the present research was sacrificed in favor of internal validity. However, Locke (1986) found that laboratory findings in industrial-organisational psychology readily generalise to field settings. An enumerative review of the literature revealed that this is particularly true with regard to the generalisability of laboratory findings on consciously set goals (Latham & Lee, 1986). Anderson, Lindsay, and Bushman (1999) compared effect sizes from laboratory and field studies compiled in 21 meta-analyses and concluded that psychological laboratories produce externally valid results. Moreover, they found that laboratory results from industrial-organisational psychology most reliably predict field results. Mitchell (2012) reached a similar conclusion using 217 laboratory–field comparisons from 82 meta-analyses.

It might be argued that the moderator identified in the second experiment may not generalise to other tasks. Given that approximately 53 per cent of the

participants in that experiment were East Asian, conscientiousness may be a proxy variable for a cultural rather than a personality difference. Alternatively, the moderator found in this experiment may be a culturally driven personality influence. This rival hypothesis is unlikely to be supported in future studies because when ethnicity was controlled in the present experiment, the results did not change.

Future research on the automaticity model should now examine two other moderators in goal setting theory, namely, performance feedback and goal commitment as no experiment to date has done so with regard to subconscious goals and task performance. Similar research on two other mediators specified by goal setting theory is also needed, namely, task persistence and strategy.

In conclusion, this research provides further evidence of the usefulness of goal setting theory for providing a framework for understanding the effects of subconscious goals on task performance. Consistent with the theory, a prime that connotes a difficult goal was shown to lead to higher performance than one that connotes an easier goal. Findings new to both goal setting theory and the automaticity model are three-fold. First, the level of goal difficulty primed in the subconscious affects the conscious choice of a goal. Second, the causal relationship between a subconscious goal and task performance is partially mediated by the conscious choice of a self-set goal. Third, the moderator of this relationship appears to be conscientiousness as measured by a self-report as opposed to a projective measure.

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