At the close of the 19th century, Freud (1891) argued that thought and action are largely determined by the unconscious. In response to the influence of Freud, James (1892) advocated the study of consciousness. By the end of the 20th century, it was clear that organizational psychologists had taken James’ exhortation seriously. For example, action theory (Frese, 2005), control theory (Carver & Scheier, 1981), and goal setting theory (Locke & Latham, 1984; Locke & Latham, 1990; Locke & Latham, 2002) emphasize the explanatory power of consciously set goals that are explicitly set and are in focal awareness for predicting, influencing and explaining behavior. Goal setting theory, for example, states that goal commitment is a conscious decision, and goal pursuit is characterized by conscious monitoring of one’s performance toward goal attainment (Latham & Locke, 2007).

A limitation of theories of consciously set goals is that they fail to 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). This is a limitation because unlike the conscious mind, the subconscious has an enormous storage capacity. This storage capacity frees the conscious mind to focus on new facts and make new integrations (Latham, 2007).

Seijts and Latham (2003) have argued the benefits of drawing on findings in social psychology to advance investigations of organizational behavior. Advantages of doing so can be seen in the literature on priming goals.

Priming. Given the emphasis throughout the history of organizational psychology on cognitively conscious theories of motivation, the field has now come a long way in arguably coming full circle. At the dawn of the present century, a crack in the door has opened to studying the effect of subconscious goals. Using priming as a technique for doing so, Stajkovic, Locke, and Blair (2006) have published the only study to date of this phenomenon. This one (albeit pioneering) study in I/O is in stark contrast to on-going programmatic research in social psychology.

The term priming was introduced in the psychological literature by Lashley (1951). He argued that there is an intervening variable (today it would be called a mediator) that occurs between the act of will or intention and the production of a response. This intervening variable, he said, is the priming of the response. Social psychologists are currently using priming techniques as a method for studying the effect of subconscious goals on behavior. Priming is the temporary subconscious activation of an individual’s mental representations by the environment and the effect of this activation on various psychological phenomena (Bargh & Chafrand, 2000). Bargh (1994) argued that during the time it remains active, it exerts an effect on an individual, one that the individual is not aware of, and is therefore unlikely to control. This conclusion is consistent with Kruglanski et al.’s (2002) goal systems theory which states that behavior that becomes routinized and hence occurs subconsciously is by no means a static response. Rather it is “an automated strategy for dealing with the environment to affect a desired goal” (p. 461).

Using the Scrambled Sentence Test, developed by Costin (1969) as a clinical projective technique, and subsequently adapted by Srull and Wyer (1979) for priming research, Bargh (1989) typically
gives his experimental group of participants achievement-related words (e.g., triumph, prevail, compete) from which to make sentences, and neutral words to the control group. Subsequently, on an unrelated task, the experimental group performs significantly better than the control group. This experimental technique is referred to as supraliminal priming in that participants are aware of the prime, that is, the semantic words, but not of the pattern or goal that is being activated (Bargh & Chartrand, 2000).

In summarizing the research on primed goals, Bargh and Bargh (2000) concluded that subconscious goals produce the same outcomes as consciously set goals in information processing, memory storage, social behavior, and task performance. In two subsequent papers, Bargh (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Chartrand & Bargh, 2002) concluded that primed goals guide self-regulation in the same ways that consciously held goals do, all without an individual’s awareness of the primed goal’s guiding role. However, neither Bargh nor other social psychologists conducted an experiment where a primed and a specific, difficult conscious goal were directly compared.

In social psychology experiments on subconscious goals, the dependent variable in most instances has arguably little relevance to behavior in work settings. For example, Altman and Trafon (2002) were able to make predictions about the role of cues in retrieving pending goals using the Tower of Hanoi, a means-ends puzzle that depends heavily on the suspension and resumption of goals. Ferguson and Bargh (2004) had participants play a game of making as many words as possible out of 15 letter tiles in order to determine whether participants automatically (unaware) evaluate goal-relevant objects more positively than goal irrelevant objects (they did). Fishbach, Friedman, and Kruglanski (2003) primed diet by exposing participants to a room filled with exercise and dieting magazines versus the control group who entered a room filled with magazines about politics and economics. They then assessed participants’ reaction time for recognizing the words related to diet, intention for avoiding fattening food, and choice of an apple over a candy bar. They found that goal-related key words were more quickly recognized following subliminal presentation of self-generated temptation key words than was the case following a subliminal presentation of irrelevant primes – all without conscious awareness of the preceding primes.

Consequently, as noted above, Stajkovc et al. (2006) conducted the first laboratory experiment to investigate the effect of both primed and conscious goals using a productivity task that is frequently used in organizations, namely, brainstorming. Consistent with Bargh, they used a supraliminal priming technique, namely, the Scrambled Sentence Test. Their study revealed a main effect for both primed and conscious goals as well as a significant interaction effect on performance. With regard to the latter, the primed goal enhanced the effect of both a vague do your best goal and a conscious specific high goal, but it did not enhance the effect of an easy conscious goal on performance.

The present studies build on this previous work in three ways. First, all previous experiments have been conducted in a laboratory by Stajkovc et al. (2006). Using a 2 (primed/ no primed) × 3 (difficult goal, easy goal, do your best) factorial design, college students were asked to make 20, four-word sentences (e.g., the eagle flew around) from five randomly positioned words (e.g., flew, eagle, the, blue, around). As noted earlier, they found main and interaction effects for both primed and conscious goals on the number of ideas for the use of a coat hanger. One day later, participants were asked to recall the experimental treatment, namely, the sentences they had unscrambled and/or the assigned goal they were assigned the previous day. After 20 s, the participants engaged in a second brainstorming task, namely, uses for a wooden ruler. Once again, Stajkovc et al. found main and interaction effects for the two types of goals on the students’ performance.

Social psychologists have offered consistent explanations for why priming affects behavior in their laboratory experiments. Shah (2005) typically primes a goal subliminally by presenting a word on a computer screen below a threshold where people report seeing it. He explained the effectiveness of priming a stimulus in terms similar to classical conditioning. A primed goal, he said, is usually presented in a given setting. Hence, a primed goal becomes associated with similar settings. A means-goal association occurs as a result of the perceived functional relationship (i.e., priming) between settings and goal attainment. The stronger the association, the higher the likelihood that upon encountering an appropriate setting, or the means to attain the goal, the person will automatically pursue the goal without awareness. Shah and his colleagues found that putting a person in surroundings containing various means to attain a primed goal moves the goal to the center of a person’s attention, thus increasing the likelihood that a person will pursue it (e.g., Fitzsimons & Shah, 2005; Shah, 2005). In short, the environment appears to activate a person’s goal as part of a subconscious analysis of the situation. Shah (2005) concluded that people were primed by a picture of a library on a computer screen, they responded more quickly to library relevant words than those in the control group. In a second experiment, the authors found that those people who were primed with a picture of an upscale restaurant on a computer screen tidied up after eating a crumbly cookie significantly more so than those who were in the control group. An explanation for the usefulness of a picture to prime a goal can be inferred from Paivio’s (1986, 1991) research. He found that behavior is affected by a cognitive system that is more responsive to pictures than words. Choosing pictures to prime a goal is an activity that can be readily applied in a work setting.

Third, the preceding experiments on primed goals have a relatively short time-lag for measuring a change in the dependent variable(s). In social psychology experiments, the effect of a subconscious goal on behavior is generally studied within a 5-min time-frame, whereas in the present field study, the duration is 3 h. The effect of specific high conscious goals on employee behavior, however, extends over months, if not years (Latham & Barclay, 1975; Latham, Mitchell, & Dotson, 1974). Howard (2005, p. 8), in the 25-year study of managers at AT&T, found that: “In contrast, to other measures, goals showed a very strong correlation with advancement (r = .43).” However, she also reported that a composite measure of projective tests (e.g., Thematic Apperception Test, Rotter Incomplete Sentences Blank) assessing subconscious motivation showed a small yet significant relationship with job advancement. Furthermore, multiple regression analyses showed that conscious goals plus these aggregated projective measures, which assess subconscious implicit motives (Meyer, 1996; Miner, 2005), contributed independent variance to the prediction of a manager’s advancement in the company. However, most experiments have not shown the effects on behavior of a primed goal beyond a few minutes.

As noted earlier, the only experiment to assess the effect of priming on the dependent variable beyond a few minutes was conducted in a laboratory by Stajkovc et al. (2006). Using a 2 (primed/ no primed) × 3 (difficult goal, easy goal, do your best) factorial design, college students were asked to make 20, four-word sentences (e.g., the eagle flew around) from five randomly positioned words (e.g., flew, eagle, the, blue, around). As noted earlier, they found main and interaction effects for both primed and conscious goals on the number of ideas for the use of a coat hanger. One day later, participants were asked to recall the experimental treatment, namely, the sentences they had unscrambled and/or the assigned goal they were assigned the previous day. After 20 s, the participants engaged in a second brainstorming task, namely, uses for a wooden ruler. Once again, Stajkovc et al. found main and interaction effects for the two types of goals on the students’ performance.
to the extent that environmental features become associated with goal pursuit, conscious choice is no longer a determining factor in influencing behavior. Similarly, both Fishbach et al. (2003) and Chartrand, Dalton, and Cheng (2007) stated that (1) environmental features (e.g., situations, people), (2) trigger automatic goal activation which (3) directly affects goal-directed cognition and behavior without the person being aware of the process.

To date, studies on priming have been largely inductive. Arguments for induction and against premature theorizing have been advanced by Locke (2007). Nevertheless, a theory in social psychology that may further explain this phenomenon is McClelland’s (1989) theory of implicit motives. McClelland labeled motivational constructs that are assessed by projective techniques as implicit motives, and those assessed by self reports as explicit motives. The former operate outside a person’s awareness. They are motivational dispositions aimed at the attainment of a specific goal. A meta-analysis of projective versus self report measures of achievement yielded an average overlap of less than 1% (Spangler, 1992). Another meta-analysis revealed that both projective and self report measures of achievement motivation predict the performance of entrepreneurs (Collins, Hanges, & Locke, 2004).

Schultheiss (2008) interpreted Spangler’s results as evidence that people lack awareness of the strength of their implicit motives, and that the goals that they set for themselves can be different from their underlying implicit goals. In short, he concluded that implicit and explicit motives do not necessarily overlap as they are two different types of constructs. Implicit motives are generally considered to be traits while explicit motives are generally considered to be states. However, priming, he argued, would appear to be an effective methodology for assigning an implicit goal (a state).

Despite the consistent findings from social psychology experiments, and the one laboratory experiment conducted within the context of organizational psychology, no study has examined the effect of priming a goal in a work setting. The number of competing traits while explicit motives are generally considered to be states. However, priming, he argued, would appear to be an effective methodology for assigning an implicit goal (a state).

The purpose of the present field experiment was to test the effectiveness of a primed goal alone and in conjunction with a specific difficult consciously set goal on employee performance during a 3-h work-shift. The present experiment differs from Stajkovic et al.’s in that it was conducted in the field rather than in the laboratory, with employees rather than with students, where the subconscious goal was primed once rather than twice, using a photograph rather than scrambled words. Moreover, the effect on a dependent variable relevant to an organization, dollars, was assessed. Thus the present study differs from Stajkovic et al. in terms of context, procedures, and dependent variable. Before conducting this experiment, a pilot study and laboratory experiment were conducted.

**Pilot study**

A pilot study was conducted to determine whether a supraliminally primed achievement-related picture increases the performance of working adults. There was neither a theoretical nor an empirical basis for hypothesizing that one photo used to prime a goal leads to higher performance than another. Consequently, the pilot study was conducted to identify which picture, if any, affects the behavior of working adults. This is the first attempt with working adults, to the authors’ knowledge, to prime performance through pictures. The task used was one that is typically used in laboratory experiments on conscious goal setting, it is one that is used by managers in organizational settings, and it is the one that was used in the Stajkovic et al. (2006) experiment, namely, brainstorming.

**Sample**

Adults (n = 52) were approached by the first author, one at a time, in a train/subway station in a large metropolitan city, on their way to work. She politely asked individuals who were waiting if they were willing to help her with a university project. There was no systematic basis for selecting/not selecting people other than making eye contact, and the speed of the person walking toward a train. Participants’ mean age was 32.56 (SD = 7.22); 60% were male. No one declined to participate in this pilot study.

**Procedure**

The first author randomly chose one of three worksheets for each individual to view. On each worksheet was printed the instructions for the task: “A coat hanger is usually used to hang up clothes. But there are other uses for coat hangers. How many can you think of?” Because the participants were stopped one at a time, none were aware that there were three different worksheets.

In the first condition, a clearly printed color photo of a woman winning a race was presented on the backdrop of the page. That is, the highly visible photograph covered the page on which the text was overwritten. The woman is Sonia O’Sullivan, an Irish athlete who won a silver medal in the 5000-m race in the 2000 Olympics. The second condition contained a collage of photos printed at the top of the page. These were not in backdrop format. Rather, they were clear, bold pictures. The collage consisted of Tiger Woods swinging a golf club, Shaekeil O’Neil playing basketball, Roger Federer playing tennis, and an anonymous runner. In the third condition, no images were on the page. These two photographs were chosen by the researchers on their assumption that one or both would subconsciously increase task performance. Consistent with the Stajkovic et al. study, each person was asked to list as many uses as possible, within a 2-min time-period, for a coat hanger.

Because this was a pilot study, these people were not questioned for awareness. We were only interested in choosing one photograph over another, or to know whether both should be discarded in favor of some other photograph. However, no one mentioned anything about either photograph to the experimenter.

**Results**

A one-way ANOVA revealed a significant main effect [F (2,49) = 4.52, p < .05]. Participants who viewed the backdrop of the female winning the race (M = 4.22, SD = 1.63) brainstormed the most uses for a coat hanger, followed by the participants who viewed the collage (M = 3.90, SD = 1.20) and those in the control condition (M = 2.92, SD = 1.47). Tukey’s HSD comparisons revealed that only the backdrop photo resulted in a significantly higher number of uses for a coat hanger than those generated in the control condition (p < .05, d = .84).

**Discussion**

That the individuals who saw the image of the woman winning the race generated more uses for a coat hanger than those in the control condition may have been due to the fact that those who saw the
collage were distracted by seeing the famous athletes in the pictures (e.g., Tiger Woods). Sonia O’Sullivan is arguably less well known in North America. Further, the images, such as Tiger Woods swinging a golf club, may have primed fame or talent rather than achievement. In contrast to the collage, the photograph clearly showed that a woman had won (achievement) the race. The collage was ambiguous in this regard (e.g., a tennis swing; a golf swing).

**Laboratory experiment**

If McClelland’s (1989) theory is to become a framework for conducting research on the effect of primed goals on achievement motivation, the Thematic Apperception Test, commonly referred to as the TAT (Morgan & Murray, 1935) should be used to assess the construct validity of a primed goal on achievement motivation. Does a primed goal elicit significantly more achievement imagery than that which occurs in a control group?

Despite the fact that Schultheiss (2008) has argued that priming is an effective method for increasing an implicit motive as a state, no study to date has investigated whether the achievement motive increases as a result of a subconscious goal. Consequently a laboratory experiment was conducted to test the hypothesis that people randomly assigned to a primed goal condition score significantly higher on a projective measure of need for achievement than those in the control condition.

Most studies treat McClelland’s (1989) implicit motive(s) as an independent variable(s) (Schultheiss & Pang, 2007). In the present study, the picture story exercise was used to determine whether the image of the woman winning the race influences a person’s implicit motive to achieve (e.g., a dependent variable). This assumes that a person’s implicit need for achievement is not “hard-wired” but may be changed. Support for this assumption comes from research by McClelland and Winter (1967, 1971) where they demonstrated that businesspeople in India benefited from training in need for achievement.

The images that are generally used in studies that measure need for achievement include people (e.g., a person on a boat) (Schultheiss & Winter, 2008). We decided to use non-human images (e.g., tree, car, dog) as pictures from which the participants were asked to write imaginative stories. This is because the prime in the pilot study and field experiment was a photograph of a person (i.e., the woman winning the race). No study to date has shown that a subconscious motive is aroused by a primed goal; all previous experiments have inferred this from a subsequent increase in performance.

**Sample**

The participants were 71 undergraduate students from a North American university. The average age of the participants was 20.86 years (SD = 1.62); 35% were male. They were randomly assigned to one of two conditions, namely, a primed goal of a woman winning a race or a control group. The participants participated voluntarily in a class exercise.

**Procedure**

Each participant was given an envelope containing an information sheet. On the information sheet were instructions for a task that they would later complete (not part of the present study). For half of the participants, the image of the woman winning the race was printed on the backdrop of the page. For the other half, the same information was provided on the information sheet, with the exception that there was no image. The first author informed the participants that it was important for them to read the instructions carefully as they would not be repeated to them.

Next the participants were informed that the researcher wanted to engage in another activity called the picture story exercise. She distributed a second envelope to each participant. The envelope contained three pieces of paper. On the top of each sheet of paper was printed the words “dog”, “tree” or “car”, respectively.

Next she explained the picture story exercise using guidelines prescribed by Schultheiss (2008). Specifically, the students were informed that their task was to write an imaginative story about each of the three pictures that would be presented to them. They were encouraged to try to tell a story about the situation, what led to the situation, and how everything turned out in the end. They were informed that they should write any story that comes to mind, without worrying about grammar, spelling, or punctuation.

Next they were instructed to remove from the envelope a sheet of paper that read “tree” on the top margin. Once they had done so, an image of a tree was projected onto a screen. The picture of the tree was presented for 15 s only. During these 15 s, the participants were reminded of their task to write a story about the image. Guided questions adapted from Atkinson (1958) were orally asked to prompt their thinking (e.g., What is happening? What has happened before? What will happen next?). After 4 min had elapsed, the participants were informed that they had 1 min remaining.

Once 5 min had elapsed, the first author asked the participants to stop working on their stories and remove the sheet of paper where the word “car” appeared on the top margin. She showed the picture of the car for 15 s, asked the same guided questions, and then gave the participants 5 min to write any story they wished about the image. The same procedure was followed with the image of a dog.

The participants were thanked and debriefed.

**Results**

Need for Achievement was measured using a computer software program called the Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001). The text analysis software calculates the extent to which people use different categories of words in texts. The dictionary defines 186 words that are related to achievement (e.g., earn, hero, win) and scans selected text for these words.

Each story was transcribed and analyzed using this software program. The dependent variable was the sum of achievement-related words, relative to the number of words for all three picture stories. Because the data violated the assumption of normality, it was transformed into its square root (Kolmogorov–Smirnov statistic was significant at .05).

An independent-samples t-test was conducted to compare the need for achievement scores for those participants who were primed versus those in the control condition. The results show that individuals who were primed (M = 2.09, SD = 1.08) with the woman winning the race wrote stories using more achievement-related words than those in the control condition (M = 1.52, SD = .98; t (70) = 2.33, p < .05, d = .22).

**Field experiment**

On the basis of the pilot study, the backdrop photograph of the female winning the race was selected for suprapriming priming employees (see Appendix A). Consistent with findings from laboratory experiments involving priming participants (e.g., Stajkovic et al., 2006), McClelland’s theory on implicit motives, as well as the empirical research on goal setting theory (Locke & Latham, 1990; Locke & Latham, 2002), two hypotheses were tested. First, a primed goal leads employees to having significantly higher per-
formance than their colleagues in the control group who are simply urged to do their best. Second, the setting of a specific, high conscious goal leads employees to having significantly higher performance than their colleagues who are urged to do their best.

Method

Sample

The participants were all 81 employees who were present in a call center on the day this field experiment was conducted. The average age of the participants was 21 years (SD = 1.82); 43% were male. They were contract employees who were hired on a temporary basis for University fund-raising purposes. These people worked independently with headphones so as to minimize disturbing one another while telephoning potential donors. They were randomly assigned to one of four conditions in a 2 (primed goal, control group) × 2 (specific, high conscious goal, “do your best” goal) design. The dependent variable was the amount of dollars raised by an employee. The employees did not know they were in an experiment per se. From their point of view it was “business as usual”. The only thing they were told is that management wanted their assessment of the information packet given to them for soliciting money.

Procedure

At the beginning of the shift, all employees were given the same information packet and they were given the same amount of time to read it. The packet contained the same written information regarding the university for whom they would be soliciting donations, namely, the recent awards to faculty, the new athletic center, and the new jazz club on campus. In the primed goal condition, this information was printed on a paper that had the backdrop photograph of a woman winning a race. In both the conscious goal condition and the control condition with neither conscious nor primed goals, the employees were given the exact same information in the exact same format with the exception that no photo was shown. The employees with neither a primed nor a conscious goal were simply urged to do their best to raise as much money as possible.

Employees with both a primed and a conscious goal, as well as those with only a conscious goal were given a specific high goal of $1200 to attain on their shift. This dollar amount was based on the manager’s and supervisor’s observations of these employees that the top 10% of callers could obtain this amount during their shift.

The employees were told that management wanted to determine the usefulness of the information contained in the packet on their ability to raise money. No employee declined to participate in this experiment.

At the end of the 3-h shift, all the employees were administered a questionnaire consisting of five open ended questions to assess their awareness of the purpose of the information packet: (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). The third question was included to assess social desirability or a demand effect as everyone should have said yes. This is because the information packet explained to everyone what was required of them to perform the task effectively. Questions 4 and 5 were included to see whether the answer to question three suggested any level of awareness of the connection of the photo to their performance.

Results

Manipulation check

The answers to questions 1 and 2 were either blank, “don’t know”, or included a summary of what the researcher announced at the beginning of the shift (e.g., that the information provided may assist in raising money). Everyone responded yes to the third question. But no one indicated any awareness of the hypotheses whatsoever. In responding to questions 4 and 5, no one reported there was a difference in the information packets that were distributed to some employees and not to others (i.e., a backdrop photograph). Instead, the responses were either “don’t know”, left blank, or included a summary of how the information provided was useful during a phone call. The answers to questions 3–5 reflected the instructions given to the employees for soliciting donations. Consequently, no one was dropped from the analysis. There were no qualitative differences among the four conditions in their answers to these questions. Since no employee asked a question or made a comment suggesting knowledge of an experiment, let alone the hypotheses, no diffusion among conditions appeared to have taken place.

Data analysis

Because the data were positively skewed (Kolmogorov–Smirnov significance is less than .05), consistent with Tabachnick and Fidell (2001) recommendation, the dependent variable was transformed to its squared root. A 2 × 2 ANOVA on the amount of money collected was conducted. Table 1 reports descriptive statistics for all conditions. A test of between-group effects, which is based on marginal means or combined performance scores, indicated a statistically significant main effect for both primed [F (1,77) = 4.94, p < .05, d = 0.43] and conscious goals [F (1,77) = 6.31, p < .05, d = 0.49]. Therefore, the two hypotheses were supported. Employees who were primed raised significantly more money than employees who were not primed but urged to do their best. Additionally, employees who were assigned a conscious difficult goal attained a higher level of performance than those who were simply urged to do their best. No interaction effect was found.

The performance of those with a primed versus a conscious goal was examined. The conscious goal effect percentage (101.15%) was

<table>
<thead>
<tr>
<th>Condition</th>
<th>Observed mean</th>
<th>SE</th>
<th>95% Confidence interval</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower bound</td>
</tr>
<tr>
<td><strong>Subconscious goals</strong></td>
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<tr>
<td>No prime</td>
<td>14.74</td>
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<td>12.25</td>
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<tr>
<td>Prime</td>
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<tr>
<td>Consciemous goal</td>
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<tr>
<td>Do your best</td>
<td>14.48</td>
<td>1.18</td>
<td>12.12</td>
</tr>
<tr>
<td>Difficult</td>
<td>18.94</td>
<td>1.32</td>
<td>16.30</td>
</tr>
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<td>Priming and conscious goal</td>
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<td></td>
</tr>
<tr>
<td>Do your best</td>
<td>16.69</td>
<td>1.58</td>
<td>13.55</td>
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<tr>
<td>Difficult</td>
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<td>16.75</td>
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<tr>
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<td>17.20</td>
<td>1.76</td>
<td>13.69</td>
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</table>
higher than the primed goal effect percentage (76.96%). Second, the percentage difference in overall means of conscious versus subconscious goals was 5%. Consistent with Stajkovic et al.'s findings in the laboratory, conscious goal effects in the present study had a stronger effect on the amount of money raised than did a subconscious goal.

General discussion

The value of the pilot study is that it prevented a Type II error. Had the wrong photograph been chosen for this study, namely the collage, the conclusion would likely have been reached that the effect of priming a goal has a negligible effect on a person's performance in the workplace. The theoretical significance of the laboratory findings is that they are the first to show that priming does in fact affect an implicit motive, namely the subconscious need for achievement measured by a projective measure, the TAT. The finding that a primed goal as well as a conscious goal was effective in increasing employee performance is consistent with the laboratory findings obtained by Stajkovic et al. (2006). This finding also is consistent with Latham and Lee's (1986) contention that laboratory findings involving goal setting typically generalize to field settings. The findings from the field experiment are both theoretically and practically significant. As was the case with those who had a consciously set goal, employees who were unaware that they had been primed to increase their performance raised significantly more money from donors than those who were not primed. The priming occurred through a straightforward, easily implemented process, namely, the presentation of a photographic backdrop of a female winning a race.

The findings from both the laboratory and field experiments are consistent with Schultheiss and Brunstein's (1999), Schultheiss and Brunstein's (2001) information-processing model that they based on McClelland's (1989) theory of implicit motives. This model posits that a conscious goal and an implicit motive each influence both declarative and non-declarative measures of motivation. The mechanism by which this process occurs, they labeled referential processing. Verbal labels are retrieved and attached to nonverbal precepts; conversely, mental images are generated in response to words (Paivio, 1986; Paivio, 1991). In short, referential processing, they said, is the active effort to connect the verbal and nonverbal domain of experience. In doing so, explicit and implicit motivational systems become aligned. Their empirical studies showed that goal commitment and self reported activation (declarative motivation), and task performance and expressive behavior (non-declarative motivation) were contingent on participants' implicit motives in the goal imagery groups, but were independent of their implicit motives in the control group. They interpreted their finding as showing that an active effort to translate verbal goal representations into nonverbal representations allows implicit motives to "understand" and respond to verbal stimuli which would otherwise be incapable of engaging them.

Bargh et al. (2001, p. 1015) argued that, "nonconsciously activated goals will cause the same attention to and processing of goal-relevant environmental information and show the same qualities of persistence over time toward the desired end state, and of overcoming obstacles in the way, as will consciously set goals." However, the additive main effects obtained by Stajkovic et al. and again in the present study show the value of having both goals for increasing job performance, regardless of whether the task involves creativity and divergent thinking for brainstorming, or persuasion skills required for fund-raising.

That a significant interaction effect was not found in the present field experiment is consistent with Bowers' (1973) and Schneider's (1978) arguments that interaction effects are typically found in the laboratory rather than in the field. Moreover, McClelland (1989), Meyer (1996) and Miner (2005) have argued that conscious and subconscious motivation are not necessarily correlates of one another, rather, they are typically distinctly different psychological phenomenon. Hence performance due to one type of goal may or may not be dependent on the level or presence of the other. Finally, the present field experiment did not include a specific conscious easy goal condition. When this condition is not included in the Stajkovic et al. laboratory experiment, there is no significant interaction effect (Locke, personal communication).

Limitations and future research

The results of the present field experiment would appear to have practical implications for workplace interior design. Since an achievement-related photo appears to have increased a subconscious need for achievement, employees can hang achievement-related pictures on the wall, use achievement-related images on screensavers, mouse pads, and sundry office equipment. Before doing so, however, further research is necessary to answer a number of questions.

As noted earlier, Bargh and Ferguson (2000) have argued that subconscious goals have the same effect on behavior as conscious goals. From the standpoint of goal setting theory (Locke & Latham, 1990), research is now needed in the workplace to assess the extent to which this argument is correct. Consistent with goal setting theory, is a primed goal that is specific to task related requirements more effective than one that is non-specific? The goal that was primed in the Stajkovic et al. (2006) study, as well as in the present one, were not specific to the task. They were simply achievement-oriented: generating achievement sentences from anagrams, or seeing a photo of a woman winning a race. What type of pictures do/does prime achievement? What is the duration of their effectiveness? Is there an optimum number (one, five)? Is there a time interval requiring one photograph to be replaced by another? Further research on the priming effects of different pictures, as well as ways to present pictures is needed as there may be other operationalizations that would create an even stronger priming effect.

Consistent with Locke and Latham's task theory of goal setting, research is also needed to assess whether a primed goal is effective with tasks that are novel and complex for people. That is, will a primed goal affect employee behavior positively on tasks where the person has yet to acquire the requisite knowledge and skill to master it? In the social psychology laboratory experiments, and in the Stajkovic et al. laboratory experiment, the acquisition of knowledge and skill were not necessary for performing the task. In the present field experiment, the employees already possessed the ability to solicit money from potential donors. A specific high learning goal differs from a performance goal in that the emphasis is on the discovery of ways that will enable goal attainment (Latham, 2007). Will a primed learning goal affect an employee's behavior in ways similar to a consciously set one? For example, would a photograph of Rodin (The Thinker) or Einstein prime a subconscious goal to increase knowledge acquisition? Of further practical significance is that primed goals consume little or no attentional resources. Part of the reason learning goals have been found to be more effective than performance goals for tasks that are novel or complex for an individual is that performance goals are thought to divert limited attentional resources away from mastering the task. If performance goals can be primed without requiring attentional resources, this would suggest that the provision of both subconscious performance and conscious learning goals might be ideal in novel or fluid situations.

A limitation of the present field experiment with regard to practical significance is that the effect of the primed goal on employee performance was examined for only one work-shift. This is because...
we were required to debrief the employees after the shift. The same people did not necessarily work on the second or third shift as they were temporary workers with different work schedules. Longer time periods should be investigated, as well as moderator variables, to determine whether the effect of a subconscious goal can be enhanced. If the effect of a primed goal is at best short-lived, as suggested by laboratory experiments in social psychology where the effect lasts at most 5 min (e.g., Bargh, 1994), the practical significance in the workplace of priming a goal relative to setting a conscious, specific, difficult goal might be in doubt. If the effect is not short lived, future field research should look at the hourly effects of a primed goal on job performance. In the present work setting, the number of dollars collected is assessed by management only at the end of the work-shift. Consequently, there is no way of knowing whether the observed differences across conditions in the present field experiment were due primarily to the employees’ performance on the first few calls in the primed condition.

In short, future research is needed to assess the long term effects, if any, of a subconscious goal as to whether the effects occur early, late, or are on-going within a work-shift, and an identification of mediators as well as moderators. To date no conscious psychological mediators of priming have been tested by social psychologists because priming occurs without awareness. Nor have there been tests of moderator variables. Had the sample size in the call center where the field experiment was conducted been larger, a test for mediation might have been possible. Unlike a laboratory, where adding participants is relatively easy, statistical power can seldom if ever be increased by requesting an employer to hire more employees. Furthermore, the demands of the workplace precluded management in the field experiment from allowing the administration of the TAT. Despite the fact that the methodology that Bargh and others use to prime a subconscious goal is designed to instill achievement, no one has tested whether subconscious goals have a differential effect on those who score high vs. low on need for achievement.

In summary, a practical reason for seeking answers to the above questions is that both theory and research (e.g., Kihlstrom, 1987; Schultheiss & Brunstein, 1999; Schultheiss & Brunstein, 2001) suggest that the amount of attention that a person can allocate to the processing of information is limited. Once attentional demands from two or more tasks exceed attentional resources, the tasks may interfere with one another. Primed goals, on the other hand, consume little or no attentional resources. Hence research on primed goals in organizational settings is important because these

Fig. 1. Image of Sonia O’Sullivan used to prime an achievement goal.
goals allow for additional complex cognitive activity to take place outside of awareness – provided the employee has the knowledge and skills to attain them.

Ethical concerns regarding the application of primed goals in the workplace, as acknowledged by Stajkovic et al. (2006), are arguably more important than limitations to the present experimental design. The results of this field experiment, viewed in conjunction with the laboratory experiments that have preceded it, suggest that primed goals affect a person’s behavior. The present experiment suggests that management can deliberately and systematically affect the subconscious goals of employees, even if it is only for one work-shift.

As Latham and Ernst (2006) argued, knowledge of the effectiveness of primed goals may, for example, tempt deans and department chairs to arrive late to university meetings so as to enable faculty members to stare at a seemingly blank screen or wall where subliminally presented images urge people to voluntarily serve on committees. It is noteworthy that during the debriefing of the employees following the present experiment that they appeared to be fascinated by the hypotheses and the research on which the hypotheses were based. None of them expressed a negative remark after learning about the primed goal. And again, none of them implied in any way an awareness of the hypotheses that were tested. Nevertheless, the ethics codes of management and scientists need to take the use of these applications into account in guiding the conduct of their respective members. The employees in this study might not have been so sanguine if their managers had been able to use a priming technique to get people to work overtime.

As is the case with the study of intuition in decision making (Dane & Pratt, 2007), both empirical research and theory on primed goals, particularly in the field of organizational behavior, remain insufficient. Many questions remain unanswered.

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Appendix A

See Fig. 1.

References


