The Relevance and Viability of Subconscious Goals in the Workplace

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This article examines the relevance and viability of pursuing empirical research on subconscious goals and applying the findings in the workplace. Five topics are addressed: First, reasons why management scholars have eschewed the study of the subconscious are given. Second, a brief overview of social psychology experiments on subconscious goals is provided. Critical issues that have yet to be addressed in these experiments are identified and discussed. Third, organizational psychology experiments on subconscious goals that have attempted to overcome several of these shortcomings and provide new findings are described. Fourth, research avenues that have yet to be explored are suggested. Finally, the implications of this stream for management practice are discussed.

Keywords: *subconscious; goal setting; motivation; goals*

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Latham (2003, 2007; Locke & Latham, 2004) has argued for a boundaryless psychology because potentially useful knowledge acquired in one discipline often goes unread in another. As is evident from the lack of citations in management journals, most scholars in human resource management and organizational behavior are unaware of, or have ignored, the programmatic research by a small number of social psychologists on priming subconscious goals (e.g. Bargh, 1992; Gollwitzer, 1999; Shah, 2005). Yet their findings may be of importance to the science and practice of management for at least four reasons. First, there is growing evidence that conscious and subconscious goals are not necessarily correlated. Their effects on job performance appear to be additive (Shantz & Latham, 2009). Second, given the limits of focal awareness (viz., 7 plus or minus 2 units), it is obvious that we rely on our subconscious continually (Locke & Latham, 2004). Third, subconscious goals consume less cognitive resources than are typically consumed by conscious goal pursuit (Anderson, 1985). Hence, they can facilitate an employee's efficiency. Fourth, subconscious goals have been shown to have effects similar to conscious goals (e.g., Bargh, Gollwitzer, Chai, Barndollar, & Troetschel, 2001; Kawada, Oettinger, Gollwitzer, & Bargh, 2004). Bargh (2005) has even gone so far as to argue that theories of conscious choice and goals are a bottleneck or obstructive nuisance to predicting, explaining, and influencing behavior. This article examines the validity of this claim.

Those management scholars who are aware of, and choose to ignore, these findings may do so because the research conducted on subconscious goals has been, until recently, relatively atheoretical in the sense that there is typically one basic hypothesis (e.g., the effectiveness of priming) rather than a detailed theory for formulating and testing hypotheses. Currently, priming is a technique. It is a method waiting for a fully developed theory. This, however, should not be viewed as criticism. As Leonardo da Vinci said centuries ago (Jurich, 2007), "First, I shall do some experiments before pressed farther, because my intention is to cite experience first and then with reasoning show why such experience is bound to operate in such a way." More recently, Locke (2007) and Roe (2009) have forcefully argued that proper theory building is inductive rather than deductive. It should be done by integrating a cumulative body of evidence. Similarly, in his discussion on the necessity for a cumulative science, Mischel (2009: 18) too emphasized the importance of induction:

> In a talk Amos Tversky gave, someone interrupted him in a threatening voice, "But what about theory?" Tversky's answer was quick. Psychology should do what it does best: design good studies and describe interesting phenomena. "Theories" he said, "I can offer a lot. But they are something we should get to after we have a lot of data and we should be very careful when we suggest them."

Mischel concluded that "science thrives when important and interesting questions lead to clever data gathering and consequential findings, and ultimately to a testable (as best one can) theory." The problem is that the extant priming research is not yet cumulating in a way that will answer the questions critical to theory building. Especially critical is to discover the mediators by which a primed goal works as well as moderators that enhance or inhibit its effect on job performance.

The purpose of the present article is fivefold, namely, to (a) explain the historical reasons for management scholars eschewing the study of the subconscious, (b) describe and critique

social psychology experiments on the effect of primed goals on behavior, (c) discuss the results of embryonic research by management scholars who are currently attempting to overcome limitations in social psychology experiments on primed goals, (d) suggest research avenues that have yet to be explored, and finally (e) examine the implications of this research stream for management practice.

Early Research on the Subconscious

At then end of the 19th and the dawn of the 20th century, Freud (1891, 1900/1913) argued for the importance of the unconscious, especially the part that he postulated could never become conscious through introspection, and recommended the interpretation of dreams for understanding psychopathology. James (1890) advocated an opposing view. In one of the earliest textbooks on psychology, he argued for a description and explanation of states of consciousness. He eschewed Freud's hypothetical constructs of the unconscious (e.g., the id) and the use of dreams as a methodology for studying behavior. Instead, James studied his own consciousness through introspection.

That management scholars heeded James's advice is evident through their research and the theories they developed throughout the 20th century (Latham, 2007). Related to the use of introspection (Locke, 2009; Locke & Latham, 2004), management scholars have used attitude surveys, personality tests, and measures of job satisfaction to predict, explain, and influence behavior.

Viteles (1932), for example, rejected Freud's concepts for understanding motives for work in favor of attitude surveys, as did Ryan and Smith (1954). The latter two researchers stated that Freud's observations that people are unaware of their "real" wishes probably reflects the fact that they do not wish to admit or explain them to a therapist. Ryan and Smith called for theories of motivation that take into account the importance of conscious intentions to anticipate future obligations or to avoid them. That the voices of James, Viteles, and particularly Ryan and Smith were heeded by both organizational and social psychologists is evident in action theory (Frese, 2005), theory of reasoned action (Fishbein & Ajzen, 1975), social cognitive theory (Bandura, 1986), and goal setting theory (Locke & Latham, 1990) where conscious intentions or goals are the foci of interest. None of these theories or the empirical research that supports them make reference to the subconscious. Hence, one reason why most management scholars have ignored research on the subconscious is historical. Icons in the behavioral sciences throughout the 20th century have emphasized the necessity for research and theory on conscious motives and needs.

Most management scholars have discarded Freud's theory because its assertions are more scientific mythology than scientific fact (e.g., the Oedipus complex). It lacks any clear, evidential base (see Locke, 2007: Note 1), it lacks predictive power, and its application seldom leads to a positive change in a person's behavior (Bandura, 2004). Thus, this is a second possible reason why most management scholars have shown little or no interest in subconscious processes, particularly Freud's work. Nevertheless, a few organizational psychologists have pursued the study of the subconscious in the workplace, albeit without reference to Freud's theory or methodology. They include Miner, Bray and Howard, McClelland, and Eden.

Projective Measures

Miner was trained as a clinical psychologist. His research output includes the development of a projective test, namely, the Miner Sentence Completion Scale (MSCS). The advantage of a projective test, Miner (2005) argued, is that it taps subconscious implicit motives. The MSCS was specifically developed to measure the implicit motives of managers in relation to their multiple role requirements. Responses given to complete the sentences on the MSCS indicate whether a manager possesses a particular motive pattern such as a favorable or unfavorable attitude toward people in authority, a desire to compete with others, or a desire to exercise power. Miner (1960) found that the MSCS not only predicted performance but also could be used as the core of a training program to increase the motivation to manage.

Miner (2005) cited Meyer's (1996) conclusions approvingly regarding the advantage of a projective measure relative to a self-report measure of personality. Meyer argued that projective measures, because they measure subconscious motives, predict long-term behavioral trends, whereas self-reports are better at predicting conscious choices and immediate situational behavior. This is because subconscious motives are developed earlier in life and are physiologically related. However, their alleged predictive advantage over self-reports is not necessarily true, as we shall see.

Between 1956 and 1960, Bray assessed the performance of managers in an assessment center, locked away the scores so upper management would not see them, and subsequently correlated those scores with the job advancement of those managers 25 years later (Howard & Bray, 1988). In addition to having their performance assessed in job simulations, the managers were administered three projective tests along with a measure of a conscious goal for job advancement. None of the three projective measures had a significant correlation with the management level the person attained 25 years later. But a composite measure of the three projective measures did have a significant albeit small relationship with job advancement (Howard, 2005). Moreover,

> In contrast to other measures, a goal measure [based on one interview question] showed a strong correlation with advancement over a 25 year time span (r = .54), even when the influence of cognitive ability was eliminated (r = .43). (Howard, 2005: 8)

Thus, in this case, the best long-term predictor was not a subconscious but rather a conscious goal. For the managers who had left the organization while the study was being conducted to become an entrepreneur, a conscious goal was also a strong predictor of salary.

Among the three projective tests used in the 25-year managerial study described above was Miner's MSCS. A second was the Thematic Apperception Test (TAT) developed by Murray (1943; Morgan & Murray, 1935). McClelland, a social psychologist, conducted research in organizational settings on ways to increase the need for the achievement of entrepreneurs in economically underdeveloped countries such as India (McClelland, 1961; McClelland & Winter, 1969). He adapted the TAT to measure their need for achievement. Collins, Hanges, and Locke (2004) performed a meta-analysis of all known studies (which were small in number) using (a) the MSCS, (b) the TAT, and/or (c) a self-report questionnaire as predictors of entrepreneurial success and entrepreneurial choice. All three measures were found to be significantly, though weakly, related to both criteria. However, no

one method predicted the criteria significantly better than the other. Thus, the three types of measures were likely measuring different aspects of achievement motivation. In an earlier review, Fineman (1977) too reported very low correlations between projective and self-report measures.

Few people have tried to replicate or build on the above findings because scoring a projective test is arguably as much an art as it is a science, the interobserver reliability in the scoring of the projective measures is often low, and the construct validity of the MSCS and the TAT has yet to be shown (Guion, 1965). Thus, reliance on projective measures, not to mention the training required to score them, is a third possible reason why many management scholars have not studied the subconscious.

A fourth explanation for why the necessity to systematically study subconscious goals has been considered superfluous by most management scholars is that conscious, task-specific goals lead to much stronger and more consistent results than the use of projective tests for predicting job performance (Howard, 2005; Locke & Latham, 1990). Moreover, consciously setting a specific challenging goal has been shown to lead to significant increases in job performance (Latham & Locke, 2007; Locke & Latham, 2002). To date, more than 1,000 studies have shown the benefits of doing so in terms of increasing job performance and, when high goals are attained, job satisfaction (Mitchell & Daniels, 2003).

Deception

Eden (1990) has studied how one person can influence the performance of another in the absence of awareness on the part of either party in an organizational setting (e.g., Israeli military). Merton (1948: 195), a sociologist, coined the term *self-fulfilling prophecy* (SFP) to denote this phenomenon. A SFP "is in the beginning false, a false definition of the situation evoking a new behavior which makes the originally false conception come true." In short, a person's actions can fulfill his or her own prophecies or expectations or the prophecies or expectations of significant others.

The Pygmalion effect was coined by Rosenthal and Jacobson (1966), two social psychologists. It refers to the effect of subconscious mental processes that lead a person (e.g., a teacher) to interact with others (e.g., students) in accordance with his or her expectations. Building on Merton's work, Rosenthal found that students tend to respond in accordance with the way they are being treated by their teachers (e.g., as intelligent vs. not intelligent; Rosenthal, 2002).

In a series of studies, Eden successfully replicated this phenomenon in organizational settings. In the typical SFP experiment, Eden, perceived by the leaders as an eminent behavioral scientist, effectively (mis)leads a leader within 5 or so minutes into believing that some subordinates, namely, those he randomly assigned to the experimental group, have high potential. The leader then becomes an unwitting prophet who fulfills his or her own subsequent expectations of these people. That is, the misled leader subsequently, though unknowingly, spends more time and more effort on the designated high potentials, and this helps them achieve more than those people who were randomly assigned to the control group (Eden, 1990).

The effectiveness of the SFP intervention on performance improvement has been corroborated by a meta-analysis of the accumulated results of experimental research in organizational settings (McNatt, 2000). The process works as follows: (a) High leader expectations result in (b) improved leadership of the person, (c) which, in turn, increases a person's self-efficacy, (d) resulting in greater motivation that includes (e) intensification of effort, which is manifested in (f) an increase in performance (Latham, 2007). With regard to Steps a and b, subconscious mental processes result in leaders treating subordinates in accordance with their expectations of them. The practical significance of this technique, however, is limited in that it is based on deception (White & Locke, 2000). As Eden and Sulimani (2002) acknowledged, few management consultants are likely to base their relations with clients on an intervention that deceives people no matter how worthwhile the performance outcomes. Moreover, using Bandura's social cognitive theory as a framework, Eden and Sulimani successfully increased self-efficacy to improve performance. Specifically, in a one-day workshop they successfully taught instructors in the Israeli military ways to consciously motivate trainees to increase their performance through verbal modeling. There was no deception.

Eden's programmatic studies have been essentially exercises in ways to increase self-efficacy through persuasion by a significant other (e.g., the leader). But as Bandura (1986, 1997) has shown, lack of awareness in doing so is not a requirement for obtaining a significant increase in an individual's self-efficacy and subsequent job performance. Because SFP and Pygmalion studies involve deception, and because the effectiveness of these interventions is limited to situations where there has been minimal previous interaction between a "deceived" leader and subordinates (Eden, 2003), there is no reason to use deception in light of the multitude of studies (e.g., Bandura, 1997; Eden & Sulimani, 2002; White & Locke, 2000) that show the effectiveness of transparently increasing a person's self-efficacy for performing a task. Thus, it is not surprising that the vast majority of management scholars to the present day have eschewed the use of deceptive practices for improving employee performance in the workplace. This is a fifth possible reason why management scholars have shied away from interventions that lack transparency, interventions where the employee is unaware that they are taking place. Will they do likewise regarding priming a goal?

Theories of Subconscious Goals

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 motives or goals on behavior. Bargh and Chartrand (2000) defined priming as the temporary subconscious activation of an individual's mental representations by the environment and the effect of this activation on various psychological phenomena. During the time it remains active, it allegedly exerts a passive effect on an individual of which the individual is not aware (Bargh, 1994, 2005).

As noted earlier, currently there is no accepted theory that explains why priming is an effective technique for inculcating a goal. Consequently, different researchers use different

terms in their study of the effect of a goal on performance when a participant is unaware of its existence. Hence, there is either construct proliferation or a problem with construct validity or lack thereof. Is the construct of the unconscious a synonym for nonconscious, preconscious, and subconscious? If the answer is no, how do they differ?

Kihlstrom (1987) made an attempt to answer this question. Using subliminal perception as an example, he described it as stimuli that despite being too weak to be detected nevertheless affect cognitive functioning. This aspect of mental life he labeled preconscious processing of declarative knowledge. Preconscious declarative knowledge, he said, can be subject to processing only by unconscious automatized procedures. Perceptual processing automatically activates preexisting semantic memory structures corresponding to the features of the stimulus event as well as related nodes by virtue of spreading attention. If some of these nodes correspond to the goals and conditions of various production systems, certain procedures may be executed as well. None of this, Kihlstrom argued, requires the involvement of working memory.

With regard to procedural knowledge, Kihlstrom hypothesized that there are a number of complex processes that are inaccessible to introspection in principle under any circumstances. By virtue of routinization, such procedures operate on declarative knowledge without conscious intent or conscious awareness to construct the person's ongoing experience, thought, and action. These mental processes, he said, can be known only indirectly through inference. Consequently, they may be described as unconscious in the strict sense of that term.

If Kihlstrom's assertions are correct, then clearly in certain contexts the use of the term *unconscious* (i.e., never available to awareness) is justified. But these assertions do not apply to all priming studies, especially those that use supraliminal priming. A great deal of information that is stored in the subconscious can be called into awareness when needed.

Currently, there is little or no empirical evidence as to whether these terms can be used interchangeably or whether they are distinctly different concepts, and Kihlstrom's arguments do not appear to have been taken into account by the social psychologists who do priming research. The present authors prefer the term *subconscious* only because no one has shown that there is material stored in the mind that can never become conscious. We define this term synonymously with Bargh's (1992; Bargh & Morsella, 2008) definition of the unconscious, namely, lack of awareness of the influences or effects of a triggering stimulus.

Bargh and Chartrand's (1999) automotive theory states that conscious goals tend to become habitualized through repeated choice of the goal in specific situations. To the extent that the same goal is chosen in a given situation, conscious choice no longer occurs as it is replaced by "automaticity." More recently, Chartrand, Dalton, and Cheng (2007) argued that (a) environmental features (e.g., situations, people) (b) can trigger automatic goal activation, which (c) then directly affects goal-directed cognition and behavior without an individual being aware of this process.

Shah (2005) explained priming effects in terms similar to classical conditioning. A primed goal, he said, is usually pursued 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., pairing) between such settings and goal attainment. The stronger the association, the higher the likelihood that on encountering an appropriate setting, or the means to attain

the subconscious goal, the person automatically pursues the goal without awareness. In short, the environment activates a person's goal as a result of a subconscious analysis of the situation. As have Bargh and Chartrand, Shah argued that to the extent that features of the environment become associated with goal pursuit, conscious choice is no longer a factor in influencing behavior. These explanations are at best mini theories inductively based on the authors' empirical research.

Epstein's (1994) cognitive-experiential self-theory (CEST) is based in part on Bargh's and his colleagues' empirical research. The theory states that there are two interactive cognitive modes of information processing, namely, a reflective, rational conscious mode and an automatic mode that does not require awareness. The former enables people to acquire information intentionally, to form ideas, and to engage in conscious analyses. The latter involves the automatic, effortless acquisition of information from experience without any conscious intention to do so. Their relative dominance is determined by individual differences in style of thinking as well as situational variables. Consistent with Bargh's empirical research, CEST further states that the subconscious level continuously influences processing at the conscious level and that it is intimately associated with experiencing affect of which people are often unaware. If one's activated feelings are pleasant, CEST states that the person is likely to take action to reproduce those feelings. Conversely, if the feelings are unpleasant, the person will likely be motivated to take action to avoid them. There is empirical evidence suggesting that a mediation mechanism (aside from motive arousal) that helps explain the effect of primed goals on behavior is indeed affect. Custers and Aarts (2007) found that people pursue a primed goal only to the extent that it preexists in their minds as a desired state associated with positive affect.

In explaining this finding, Custers and Aarts (2007) drew on recent findings in neuroscience that indicate that the mesolimbic dopamine system is involved in the processing of the affective valence of a behavioral state to produce goal-directed, motivated behavior (Berridge, 2003; McFarland & Kalivas, 2003; Salamone & Correa, 2002). Through connections with the dopamine system, Custer and Aarts theorized that primed behavioral states associated with positive affect excite cortical brain structures that encode the state's incentive salience (desiredness) and modulate the effort exerted in pursuing it. Their research showed that positive affect is capable of directly affecting the desire and effort to attaining a primed behavioral state.

Dijksterhuis and Nordgren's (2006) unconscious (what we call subconscious) thought theory states that a conscious goal results in superior analytic thinking, whereas unconscious thought is optimal for solving problems that are complex for an individual. This is because conscious thought is constrained by low capacity. The theory further states that attention is the differentiator between these two thought processes. Unconscious thought occurs in the absence of attention or when attention is focused elsewhere. Both conscious thought and unconscious thought, the theory states, are goal directed. However, the core of this theory, based largely on deduction, is highly questionable. Conscious thought is required for complex decision making, along with subconscious processing. No business leader would launch a new product without enormous thought and planning. Failure to do so would be a disaster.

Payne, Samper, Bettman, and Frances-Luce (2008) have already found two important boundary conditions for the alleged superiority of and unconscious goal for solving complex

problems. Conscious thought was shown to perform as well as subconscious thought when the former was self-paced rather than artificially constrained, and it outperformed subconscious thought in a choice environment where performance depended on magnitude of information. The researchers concluded that it is important to take into account the interaction of forms of processing with task demands (e.g., choice environments) before giving prescriptive advice. Their admonition points to the desirability of building theory on, rather than prior to conducting, empirical research.

Activation of Subconscious Goals

Subconscious goals are typically activated through either a subliminal or a supraliminal priming technique (Chartrand & Bargh, 2002). Subliminal priming usually involves presenting the primed material on a computer outside the field of focal vision, so the participant does not report awareness of it. For example, the means word (e.g., *run*) in a means–goal relationship (*run* → *fit*) might be shown subliminally, and the dependent variable is the participant's response latency to the word (*fit*; Shah & Kruglanski, 2002). Bargh and Morsella (2008) criticized the use of this technique because subliminal stimuli, they said, do not naturally occur. They are typically too weak or brief in natural settings to affect behavior. Hence, the two authors favor supraliminal priming.

Supraliminal priming involves consciously providing participants in the experimental group with information, but in a way that seems to have no relation to the experimental task that follows. For example, in one frequently used method, participants are asked to find and circle a number of achievement-related words (e.g., *win*, *compete*, *succeed*) in a word matrix. In another frequently used method, participants in the prime condition are asked to unscramble four-word sentences, each containing one achievement-related word (e.g., *want*, *I*, *to*, *win*; "I want to win"; where *win* is the primed word in the sentence). Participants in the control group are given neutral words (e.g., *pretty*, *green*, *lamp*, *the*; "the pretty green lamp") in matrices or "scrambled" sentences. Then all participants are given a seemingly unrelated task to perform.

At the end of the experiment, participants may be administered questions concerning their awareness of the priming, the supraliminally primed words, and the purpose of the study. Those who report any awareness are removed from the experiment. Typically, primed participants perform significantly better on the dependent variable than do those in the control group.

Most social psychology studies of subconscious goals have used supraliminal rather subliminal priming. Some involve mimicry, that is, seeing if participants who observe a stooge shaking a foot or smiling exhibit those same behaviors during a subsequent discussion in the absence of awareness during the pre and post measure, as compared to participants in the control group (Bargh & Chartrand, 1999). Other studies involve norm activation, such as showing participants a picture of a library and subsequently measuring their response time to such library-relevant words as "quiet" (Aarts & Dijksterhuis, 2003). As noted earlier, priming presumably activates goals in the subconscious that are representations of desired end states, thereby eliciting action consistent with goal attainment (Förster, Liberman, & Friedman, 2007). Researchers in social psychology have shown that priming a trait (e.g.,

aggression), stereotype (e.g., the elderly), or behavior (e.g., moving one's foot) increases the likelihood that a participant will subsequently perform the prime in the absence of awareness of the influence.

Additive and Competing Effects of Conscious and Subconscious Goals

One of the most rigorously supported theories that answers the question of what motivates people at work has been provided by Locke and Latham's (1990, 2002) goal setting theory. In brief, this theory states that the answer is the goals to which employees are committed. This is because a goal is a conscious regulator of behavior. This theory, however, acknowledges but does not take into account the effect on an employee of a subconscious goal that may or may not be congruent with a conscious goal (Latham & Locke, 2007).

Kruglanski, Shah, Fishbach, Friedman, Chun, and Sleeth-Keppler's (2002) goal systems theory states that goal representations are governed by the same rules as other mental representations and that automatic associations can develop between goals and other representations that are frequently and mostly used at the same time. These interconnections may be either facilitative or inhibitory, depending on the relations between the goals involved. When the attainment of a conscious goal is related to the attainment of a subconscious goal, pursuing one goal leads to an integration of a related goal concept. Opposing goals, however, may compete for cognitive resources. The likely result is that the two goals will inhibit one another. A series of five experiments found that people refrained from acting on a subconscious goal for "sweets" more when the conscious goal of dieting was indirectly triggered by the primed goal than was the case when no goal was triggered (Fishbach, Friedman, & Kruglanski, 2003).

Légal, Meyer, and Delouvée (2007) also examined the way in which a primed and a conscious goal combine to affect behavior. They hypothesized that when the two are compatible, their effects should be additive. When the two are incompatible, there are two competing hypotheses: (a) a conscious goal eliminates priming effects and (b) a primed and a conscious goal are processed in a relatively independent manner. Thus, the effect of subconscious priming should decrease but not necessarily disappear in the presence of an incompatible conscious goal. Consequently, there should be two main effects, but people with conflicting goals should perform less well than those with nonconflicting goals.

Using a 2×3 design, the researchers primed participants for either accuracy or inaccuracy in moving a ring along a twisted wire. General rather than specific conscious goals were assigned: be very accurate and be moderately accurate. In addition, there was a "no instructions" control condition. Additive effects for the two goals were found when they were congruent; subtractive effects were obtained when they were incongruent. A limitation of this experiment is that there was no conscious goal for inaccuracy to parallel the priming condition.

Unresolved Issues

A limitation of social psychology experiments on primed goals is that they rarely include a manipulation check for awareness (Förster et al., 2007). An exception is a laboratory

experiment by Bargh (1996). Immediately after making achievement-related sentences from scrambled words, 19 participants were asked to complete a version of the contingency awareness funnel debriefing, modeled after Page (1969): (a) Did the participant suspect that the purpose of the experiment was different from what the experimenter had explained? (b) Did the scrambled words have any relation to each other? (c) What possible ways could the sentence made from the scrambled words influence your behavior? (d) Whether the participant could predict the direction of an influence, if the experimenter had intended one. (e) What the words in the scrambled word-sentence task could have related to, if anything. (f) Did the participant suspect or notice any relation between the scrambled word-sentence task and the concept of age (the prime was elderly)? Bargh reported that only 1 of the 19 participants showed any awareness of a relationship between the task and the purpose of the experiment.

A second limitation of this literature is that no steps have been taken to assess whether a primed goal actually affects the subconscious. To what extent are experimenter bias and demand effects affecting the results? Even if neither is taking place, we do not know what is being manipulated by a subconscious prime.

A third limitation, related to Bargh's research, is the lack of specificity regarding methodology. The ideal percentage of achievement sentences to be completed from scrambled words has not been established. The percentage appears to vary from 53% to 67% in Bargh's published studies. Other priming researchers have recommended an even higher percentage.

Bargh et al. (2001) found that a subconscious achievement goal has many of the qualities of a conscious goal (i.e., led to higher performance, increased in strength over a 5-minute period, led to persistence in the face of obstacles, and led to a resumption of goal pursuit following an interruption). Nevertheless, this finding does not justify Bargh's (2005) claim that theories of conscious choice and goals are a bottleneck or obstructive nuisance to predicting, explaining, and influencing behavior. Thus, a fourth limitation is that researchers in this domain have yet to compare the effect of a specific, conscious goal to one that is subconscious on performance. Goal setting theory (Locke & Latham, 1990) has been ignored in the extant studies. This is unfortunate because Bandura's (1986, 1997) research as well as Latham's (Latham, Seijts, & Crim, 2008; Seijts & Latham, 2001; Winters & Latham, 1996) have shown that conscious thought is indispensable for the acquisition of competencies. It is much less essential when engaging in routinized habits. But it is a must when habitual behavior is ineffective for mastering a new task. Groopman (2008: 9), in a qualitative study of the decision making errors by medical doctors, wrote, "As we hear from a range of physicians, relying too heavily on intuition [subconsciously stored information] has its perils. Cogent medical judgments meld first impressions . . . with deliberate analysis. This requires . . . time to think."

A fifth limitation from the standpoint of practice is the short time lag for measuring a change in the dependent variable following a primed goal, typically only a few minutes (e.g., Bargh, 1994; Bargh et al., 2001). This is likely because of the fact that the social psychologists have feared that a prime may not endure in memory. If the effect of a subconscious goal is relatively short lived, the practical significance for studying this phenomenon in the workplace is questionable. In contrast to a subconscious goal, the effect of a conscious goal on high performance has been shown to last for years (Howard & Bray, 1988; Latham, 2007; Latham & Baldes, 1975).

A sixth criticism of this literature is that the dependent variables used in social psychology experiments are of questionable relevance to an individual's performance in an organizational setting (e.g., length of time to walk to an elevator from a researcher's laboratory immediately after the presentation of a primed goal such as yawning; choosing healthy versus unhealthy food following a prime to diet; use of a remote association test for measuring response latency to solution-related versus solution-unrelated words).

A seventh limitation of the social psychology research on subconscious goals is that studies have yet to be conducted on whether other conscious processes in goal setting (Locke & Latham, 1990) and social cognitive theories (Bandura, 1986) can be primed (e.g., self-efficacy). Priming research by management scholars, however, is beginning to take into account many of these limitations.

Management-Related Research

Stajkovic and Locke, skeptical of the above findings in social psychology, worked with Blair (Stajkovic, Locke, & Blair, 2006) to conduct an experiment, based on both goal setting theory and the priming literature, to manipulate a conscious, specific, easy, do best, and difficult goal crossed with a subconsciously primed goal and no priming. The purpose was to see if each had separate effects. Using Bargh's methodology, priming in the Stajkovic et al. study was done using scrambled words, 60% of which were achievement related, to make sentences. They found that both specific conscious goals and subconsciously primed goals significantly affected performance on a brainstorming task. They also obtained an interaction effect between the two goal conditions. This was likely because of priming being ineffective for participants who were assigned easy goals. We have no explanation for this finding. (Subsequent priming studies have not used easy goals.) In addition, these researchers found that the effect of a specific high conscious goal was stronger than that of a primed goal. These findings were replicated in a 24-hour follow-up experiment where the participants were asked to recall the words in the sentences and the assigned conscious goals. This finding undermines the contention that a conscious goal is a bottleneck to predicting, understanding, and influencing behavior.

Next, Stajkovic, Locke, and Blair (2009) examined what occurs when a subconscious and a specific conscious goal are in conflict. A conscious, specific difficult goal versus no goal was set for both speed and accuracy, as were primed goals. In addition, there was a no-prime condition. This study differs from Bargh et al.'s (2001) Experiment 2, where they used a general rather than a specific conscious goal—and found no effect. Likewise, Légal et al. (2007) and Kruglanski et al. (2002), as noted earlier, examined a general rather than a specific conscious goal. Stajkovic et al. (2007) found that when priming worked, conflicting speed and accuracy goals undermined performance compared to the condition where the primed and specific goals were congruent. Surprisingly, one type of priming was more effective for speed (i.e., scrambled sentences) and another type (i.e., word matrix) was more effective for accuracy (Stajkovic, Locke, Blair, & Piccolo, 2009). There is no readily apparent explanation for this finding at this early stage in priming research.

Two subsequent questions addressed in their research program were the following: Can other conscious concepts in organizational psychology be primed? And do conscious variables mediate the effect of a subconscious goal on performance? Self-efficacy, given its

prominent role in psychology, was examined (Stajkovic, Locke, Bandura, & Greenwald, 2007), as were potential mediating mechanisms (self-set goals, conscious self-efficacy) in the relationships between primed self-efficacy and performance, and primed achievement goals and performance (Stajkovic, Locke, Bandura, & Greenwald, 2009). Their results revealed that primed self-efficacy had a significant effect on both self-efficacy and performance. Furthermore, the effect of primed self-efficacy on performance was fully mediated by conscious self-efficacy, but not by self-set goals. In contrast, a primed achievement goal affected self-set goals and performance. The effect of primed goals on performance was fully mediated by self-set specific goals, but not by conscious self-efficacy. These findings suggest that (a) subconscious concepts may, at times, work through their conscious counterparts to affect performance and (b) they may be concept specific. Primed efficacy affected conscious self-efficacy, but not self-set goals.

Encouraged by the laboratory results obtained by Stajkovic et al. (2006) but still doubtful of their viability in the workplace because of the short time lag for assessing the effect of the independent variable on the dependent variable, Shantz and Latham (2009) conducted a field experiment to determine whether the laboratory results for a conscious and subconscious goal generalize to the workplace. This research was necessary because the demand effects of the workplace, a strong situation (Mischel, 1973), might mitigate the effect of a subconscious goal on an employee's performance. The subconscious goal in this study was primed through the use of a photograph of a woman winning a race rather than through creating achievement-related sentences from scrambled words. The relevance of this latter task to the work setting might be questioned by employees.

In a pilot experiment involving working adults, those who were primed by a backdrop photograph of a woman winning a race wrote significantly more ideas for a brainstorming task than did those who were given a blank page to list their ideas. Similarly, in the field experiment, employees in a call center raised significantly more money during a work shift when the backdrop of the woman winning the race was presented to them than was the case for those in the control group where the instructions for their shift work were presented on a blank sheet of paper. Using a variation of the verbal funnel debriefing (Bargh, 1996; Page, 1969) described earlier, the researchers found that none of the employees in the experimental condition reported an awareness of the photograph, let alone the hypotheses that were being tested. The specific, conscious goals that were assigned also affected performance. Thus, the effects of the two types of goals were additive, though the conscious goal effect was stronger than the subconscious goal on performance.

The findings obtained in this field experiment and the preceding laboratory experiments by Stajkovic et al. (2006) support both Meyer's (1996) and Miner's (2005) contentions that conscious and subconscious motivation are not typically correlated. Rather, they appear to be different psychological phenomena. Hence, there appears to be a necessity for studying the effect of subconscious goals, in addition to conscious goals, in work settings. The finding by both Stajkovic et al. (2006) and Shantz and Latham (2009) that a conscious goal has a greater effect on performance than a subconscious goal calls into question Bargh's (2005; Chartrand & Bargh, 2002) claim that an individual's behavior is largely, if not solely, affected by subconscious functions: "Most of a person's everyday life is determined not by their conscious intentions and deliberate choices but by mental processes that . . . operate outside of conscious awareness and guidance" (Bargh & Chartrand, 1999: 462). Contrary to

Bargh and Chartrand's claim, introspection reveals that an individual makes hundreds of conscious decisions daily, even though the subconscious is always at work.

Shantz and Latham (2009) used McClelland's (1987, 1989) theory and method of measuring implicit (subconscious) motives as a framework for conducting their field experiment. Consistent with Miner's position, McClelland's theory states that implicit and explicit motives are two different concepts. Hence, they do not necessarily overlap, as noted earlier. The theory further states that implicit motives, such as need for achievement, are optimally measured by a projective test, the TAT (see Collins et al., 2004, noted above; Schultheiss & Brunstein, 2001).

As previously noted, a criticism of the preceding experiments in social psychology on priming goals is that steps are not taken to determine whether the subconscious is indeed affected by a prime. The experimenter at best only checks for a participant's lack of awareness of it. Consequently, Shantz and Latham (2009) conducted a second study where they administered the TAT following the prime of a woman winning a race. They found that need for achievement imagery was significantly higher in the primed than in the control condition. This finding is consistent with Schultheiss and Brunstein's (1999, 2001) information processing model that they developed on the basis of McClelland's theory of implicit motives. McClelland's model posits that verbal cues inherent in a conscious as well as an implicit motive influence both declarative and nondeclarative measures of motivation. Schultheiss and Brunstein labeled the mechanism by which this process occurs referential processing. Verbal labels are retrieved and attached to nonverbal percepts; conversely, mental images are generated in response to words (Paivio, 1986). In short, referential processing, they said, is the active effort to connect the verbal and nonverbal domains of experience. In doing so, implicit and explicit motivational systems become aligned.

Two further limitations of research on primed goals, as noted earlier, are the lack of controls for demand effects and experimenter bias. In the extant research on subconscious goals, the experimenter has been present when the participants were performing the task. Second, with the exception of the Shantz and Latham (2009) field experiment, where no employee showed signs of awareness of the hypotheses or experimental procedures, researchers have discarded data from a participant who indicated an awareness of the hypotheses. It is not known whether any of the experimenters were subconsciously biased to discard data from participants who did not respond "correctly" (e.g., posed too many questions awkward to the experimenters; responded to a questionnaire or interview in ways opposite to the hypothesis). Moreover, an experimenter's presence plus the participants' knowledge they were in an experiment may have cued them unknowingly to perform in ways supportive of the hypothesis that was being tested.

To overcome these two limitations, Latham and Piccolo (2009) conducted a field experiment involving call center employees where the experimenters had no contact with the employees. The experiment was conducted by the employees' supervisor who was blind to the hypotheses being tested. Data were collected on a dependent variable hypothesized to increase as a result of a primed goal, namely, performance defined by the number of donor pledges. In addition, unlike the Shantz and Latham (2009) field experiment, this study was conducted over an entire work week rather than one work shift.

Locke and Latham's (1990, 2002) goal setting theory, which stresses the importance of goal specificity, as well as McClelland's (1987, 1989) theory and method of measuring

implicit motives were used as frameworks for designing and implementing this study. In the field experiment, consistent with goal setting theory, only a subconscious goal specific to the work that was being performed (i.e., a photograph in the upper-right-hand corner of the instructions for calling potential donors showed three people in a call center wearing standard headsets) led to significantly higher fund-raising performance for the work week. The increase in performance of those employees with a subconscious achievement goal (i.e., a photograph in the upper-right-hand corner of the instructions for calling potential donors showed a woman winning a race) was only marginally significant. No change in performance occurred in the control group. Thus, it does not appear that the findings obtained in research involving priming can be attributed to experimenter bias or demand effects. It appears that, consistent with goal setting theory, priming that is goal specific to the task is more effective than priming that is less task specific. Furthermore, these results do not appear to be because of experimenter bias or demand effects. Finally, the effect of a subconscious goal on performance appears to last longer than 5 or so minutes—it lasted for an entire work week.

To more conclusively determine whether the photographs primed a specific goal or a more general achievement goal, Latham and Piccolo (2009), in the same study, conducted a laboratory experiment. Using the same primes that were used in the field experiment to determine if they led to differential strengths in achievement motives, as measured by the number of achievement-related words in a TAT generated story, the participants were given the following instructions: "This is a test of imagination. Here is a picture; look at it carefully. Make up as dramatic a story as you can for it."

Responses to the TAT revealed that priming can indeed affect a specific subconscious goal. The prime for doing one's job (a photograph of three employees making phone calls) led to a significantly higher number of (a) work-related and (b) money-related words in the stories people wrote than was the case for the stories written by people primed for achievement (photo of a woman winning a race) or those written by those in the control group. Those in the control group wrote stories with significantly fewer achievement words than those in the primed, achievement, goal condition who saw a woman winning a race. In short, consistent with goal setting theory and the previous results, Latham and Piccolo found that a subconscious goal that is specific to a person's work leads to a significantly higher number of imagery stories of work and money than a less specific goal or a no-prime control condition. Thus, the underlying mechanism of a primed goal in this study appears to be goal specificity and/or the arousal of a need for achievement.

Research Avenues That Have Yet To Be Explored

Priming appears to be a straightforward technique for inculcating the achievement motive (and other motives) as a state. Nevertheless, there are many unanswered questions. For example,

1. What methods of priming are effective?
   a. What is the ideal number or percentage of prime words in the scrambled sentences method or the matrix method? Typical studies using scrambled words to write achievement-oriented sentences have about 60% prime words, and some researchers claim that 90% is preferable (Chartrand, personal communication, March 7, 2008). If the latter is correct, it is dubious that most participants are unaware of the prime.

b. Do different types of priming work equally well, and, if not, why not? Stajkovic et al. (2009) found that sentence formulations from scrambled achievement-related words were effective at priming speed but not accuracy in a proofreading task. Yet a word matrix was effective in priming accuracy and more so than priming for speed. Similarly, as noted earlier, Latham and colleagues found that different photographs have different effects on performance (Latham & Piccolo, 2009; Shantz & Latham, 2009). Are there optimal priming methods for different motives, or are they in some cases functionally equivalent? This issue is important because if the results from a priming study are not significant, one needs to know whether the fault lies in the theory, the methodology, or both. Complicating matters, it may be that different priming manipulations tap into different parts of the mind and thus different areas of the brain, which in turn have differential effects on behavior. For example, if a priming manipulation taps into the prefrontal cortex (which handles rational, long-term consequences), it would be less effective for concepts in the limbic system (which handles emotional, short-term choices) system. It is also possible that a prime is operationalized by the anterior cingulated part of the brain, which determines whether incoming information is delegated to the prefrontal, cortex, or limbic system (Coy, 2005). Different concepts may have different propensities to be primed.

2. What is the effect on job performance of participants' awareness of the nature or purpose of the experiment?
   a. Routinely, aware participants in studies of subconscious goals are discarded. There are few data on how the aware participants perform. Lombardi, Higgins, and Bargh (1987) and Strack and Hannover (1996) have argued that awareness will have a reactive effect. That is, performance will decrease. Yet this seems odd, considering the positive effect that demand effects typically have on a participant's performance in a laboratory experiment (e.g., conscious goal theory experiments). Is there a deleterious effect in a work setting when an employee becomes aware of a prime? To test this idea, Stajkovic et al. (2009), using scrambled sentences, primed 20%, 40%, 60%, 80%, and 100% with accuracy-related words. A one-way ANOVA of their data did not show a significant *F*-ratio, even though the 100% mean was somewhat lower than the others. Furthermore, not reported in the Shantz and Latham (2009) field experiment is that data were collected for a second work shift, the day immediately following the debriefing of the employees. The results did not change. Those who had been primed with an achievement goal continued to perform significantly higher than did the employees in the control group, even though the individuals in the latter group were now aware of what had taken place in the experimental group.
   b. Bargh (1996) himself has acknowledged that the crucial factor in concluding that the results of an experiment show subconscious goal effects on performance is the participant's lack of awareness of the influence of a prime. Do the questions typically asked by researchers correctly identify the participants' actual degree of awareness? The same questionnaire is typically used in most studies of primed goals, but different types of questions may need to be asked. Bandura (1986) has argued that awareness is not a discrete phenomenon; rather, there are gradations of awareness. Appropriate or inappropriate ways of assessing the aware or unaware continuum have yet to be addressed. Förster et al. (2007) have suggested seven novel manipulation checks for determining whether a goal has been primed (e.g., an increase in value for things that are conducive to goal attainment; a decrease in value for things detrimental to goal attainment). To date, these suggestions have not been tested.
3. What are the mediators and moderators of subconscious goals?

a. If, as the results from studies by Latham and colleagues show, priming arouses specific types of imagery on projective tests, do scores on these tests mediate priming effects as they logically should? This would validate the hypothesis that the key to priming effectiveness is arousing a subconscious motive.
b. Are priming effects also mediated by the same factors as conscious goals?
c. What types of moderators (e.g., natural primes from the environment, conscious intentions) affect the duration of a prime or inhibit priming effects?
d. Similarly, consistent with goal setting theory and CEST, are there tasks that moderate the effect of a subconscious goal on performance? On all the tasks used to date in social as well as organizational psychology experiments where a goal was primed, the participants possessed the knowledge to attain it. Will a subconscious goal be effective in increasing job performance on a task for which a person must acquire the knowledge or skill to perform effectively? In other words, can people be primed to seek new knowledge just as they can be primed to execute actions based on what they already know?

On the latter issue, Gollwitzer's (1999) studies in social psychology suggest that priming may lead to the later automatic implementation of a goal or intention that the person knows how to execute. An implementation intention is a mental link that is created between a specific situation and an intended goal-directed response (i.e., "If I am in this situation, then I will . . ."). In short, an implementation intention specifies when, where, and how behavior is likely to lead to goal attainment once an appropriate situation is encountered. Once an intention is formed, people switch from conscious, effortful control of conscious goal-directed behavior, becoming "automatically" controlled by preselected cues. When the cues are activated, motivation guides a person's behavior toward goal attainment. Gollwitzer has consistently found that conscious goal setting that is accompanied by implementation intentions on tasks that are complex, as opposed to those that are straightforward for people, leads to a higher rate of goal attainment than conscious goal setting alone. The complexity of the task for a person enhances rather than inhibits this effect. The reason for this is not known. Logically, it would seem that the very process of planning a complex action enhances commitment to the goal, but a meta-analysis did not find empirical support for this hypothesis (Webb & Sheeran, 2008). Gollwitzer (personal communication, March 22, 2009) believes that

> it is the heightened accessibility of the situation specifically, the if-part and the strong metal link that is created to the then-part that make the immediate and effortless action initiation without further conscious intent—a given that pays off most when the going gets though (cognitive load is high).

e. Both goal setting theory (Locke & Latham, 1990) and empirical research (Locke & Latham, 2002) explain the moderating effect of performance feedback on the effectiveness of goal setting. What type of feedback, if any, moderates the duration of a subconscious goal effect on performance in a work setting?

4. Are there individual differences that moderate priming effects?
   a. CEST states that messages that are appealing to those people who process information primarily experientially may be relatively ineffective for those who process information primarily in the rational mode and vice versa. Future research on primed goals is needed to test these assertions.

b. Similarly, are subconscious goals moderated by, or do they mask, personality variables such as goal orientation and conscientiousness? Is intelligence a moderator of the effects of priming on job performance?

5. What is the practical significance of subconscious goals?
   a. The results of two field experiments (Latham & Piccolo, 2009; Shantz & Latham, 2009) suggest that management should hang achievement-related images on screen savers, mouse pads, and office equipment. Better still, they should hang pictures of the desired work that is to be done. Before doing so, research is needed on the type of pictures that do and do not prime a goal. Moreover, knowledge is needed on the duration of a photograph's effectiveness on job performance.
   b. Are there an optimal number of photographs (e.g., 1, 10, 100)?
   c. Is there a time interval requiring one photograph to be replaced by another? Further research on the priming effects of different pictures or ways to present them is needed, as there may be other operationalizations that would create an even stronger priming effect.
6. Finally, does this research domain suffer from construct proliferation or construct validity?

Implications for Management Practice

A practical reason for seeking answers to the above questions is that we know that the amount of attention that a person can allocate to the processing of information is limited (Sarason, 1980). Once attentional demands from two or more tasks exceed attentional resources, the tasks interfere with one another. Subconscious goals, on the other hand, consume little or no attentional resources. If performance goals can be primed without requiring attentional resources, this suggests that providing both a subconscious performance and a conscious learning goal would be useful, not only in terms of their additive effects on routine performance but also in novel situations where employees need to acquire the requisite knowledge and/or skill to perform effectively.

In short, research on subconscious performance goals would appear to be important in organizational settings because these goals might allow for additional complex cognitive activity to take place outside of conscious awareness. But there is a potential risk to the implementation of findings from research in this domain: People may be inappropriately manipulated.

Consider scenarios where priming is used in training manuals for a company's sales force (e.g., words such as *customer focus*, *generate sales*, *win business* are systematically inserted) or in written communication to engineers or scientists in an R&D division (insert the words *creative*, *discover*, *develop*). Similarly, Latham and colleagues have already shown the benefit of different types of photographs for priming increases in job performance. Should we as scientists be concerned with how these findings may some day be misused by leaders in organizations?

As Latham and Ernst (2006) commented, the day may come when we scientists are among those adversely affected by our own research. Will university deans and department chairs be able to use the findings from studies in this area to effectively motivate faculty to serve on an excessive number of committees or teach a course beyond the normal faculty work load? Will union leaders similarly use priming as a technique for motivating the rank and file to vote up or down on a proposed strike? In Latham's field experiments, the employees expressed both curiosity and amusement during the debriefing session. Would they have

done so had the prime been used effectively for influencing them to volunteer to work overtime? From the standpoint of implementation, these and related questions regarding subconscious goals are as important as those that are necessary for the advancement of science.

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