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The Automated Will: Nonconscious Activation and Pursuit of Behavioral Goals

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It is proposed that goals can be activated outside of awareness and then operate nonconsciously to guide self-regulation effectively (J. A. Bargh, 1990). Five experiments are reported in which the goal either to perform well or to cooperate was activated, without the awareness of participants, through a priming manipulation. In Experiment 1 priming of the goal to perform well caused participants to perform comparatively better on an intellectual task. In Experiment 2 priming of the goal to cooperate caused participants to replenish a commonly held resource more readily. Experiment 3 used a dissociation paradigm to rule out perceptual-construal alternative explanations. Experiments 4 and 5 demonstrated that action guided by nonconsciously activated goals manifests two classic content-free features of the pursuit of consciously held goals. Nonconsciously activated goals effectively guide action, enabling adaptation to ongoing situational demands.

> We must give up the insane illusion that a conscious self, however virtuous and however intelligent, can do its work singlehanded and without assistance.
>
> —Aldous Huxley, *The Education of an Amphibian*

Today, most theories of goal pursuit emphasize conscious choice and guidance of behavior on a moment-to-moment basis (e.g., Bandura, 1986; Carver & Scheier, 1998; Deci & Ryan, 1985; Gollwitzer, 1990; Locke & Latham, 1990; summaries in Gollwitzer & Moskowitz, 1996; Mischel, Cantor, & Feldman, 1996; Oettingen & Gollwitzer, 2001). But at the same time, much of contemporary psychology has come to recognize that a great deal of human functioning is rooted in nonconscious processes as well—that is, those processes that do not require conscious control. Across such varied research domains as attention and encoding (e.g., Shiffrin & Schneider, 1977), the uses of memory (e.g., Schacter, 1987), emotional appraisal (e.g., Lazarus, 1991), attitudes and persuasion (Chaiken, 1980), social perception and judgment (e.g., Bargh, 1994), and causal attribution (e.g., Gilbert, 1989), the consideration of both conscious and nonconscious determinants is the norm rather than the exception. Yet this general trend within psychology has only just begun to reach the domain of goal pursuit (Bargh & Gollwitzer, 1994; Glaser & Banaji, 1999; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999).[1]

In the present article, we suggest a comprehensive approach to goal pursuit that allows for the nonconscious activation and operation of goals as well as the traditional conscious, controlled mode of goal pursuit. We postulate that mental representations of goals can become activated without an act of conscious will, such that subsequent behavior is then guided by these goals within the situational context faced by the individual. In other words, just as most other areas of psychology recognize the nonconscious activation of mental representations, so too is it possible that goal representations do not need always to be put into motion by an act of conscious choice.

Automatic Goal Pursuit

Our argument is that goals can be triggered outside of awareness and then run to completion, attaining desired outcomes (Bargh, 1990; Bargh & Chartrand, 1999; Bargh & Gollwitzer, 1994). No conscious intervention, act of will, or guidance is needed for this

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[1] An apparent historical exception is the distinction made by McClelland, Koestner, and Weinberger (1989) between *self-attributed* (available to self-report) and *implicit* motives (expressed in fantasy and on projective tests). However, McClelland et al. did not argue that goal pursuit takes place both nonconsciously and consciously. Their point was rather that the two forms of measurement tap different kinds of chronic motives, and thus predict different kinds of behaviors and outcomes.

form of goal pursuit. In this view, 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. Thus, at its core, our hypothesis is simply that however a goal is activated, either by conscious or nonconscious means, it will operate effectively to guide a person's goal-relevant cognition, affect, and behavior from that point on.

That sophisticated skills and goal pursuits can, with sufficient experience, operate autonomously is a well-established principle of mental and motor skill proceduralization (e.g., Anderson, 1983; Smith, 1994; Vera & Simon, 1993; Wegner & Bargh, 1998). As Jastrow (1906) argued in his seminal work on the subconscious, "when habit acquisitions reach a subconscious and subvoluntary stage they require merely the initial start . . . to run themselves off the reel" (p. 45). Yet the skill acquisition literature has always assumed that these processes are started in motion by an instigating act of will. Traditionally, then, goal pursuit has been assumed to require an act of conscious will to be instigated, regardless of how autonomously these procedures may then operate. What we are adding to the idea of skill acquisition or proceduralization is that goals can be put into motion without requiring conscious choice and instigation.

How can goals develop the capability of nonconscious activation? We first assume, along with Tolman (1932) and Hull (1931), that goals are represented mentally just as are other concepts (Bargh, 1990; Kruglanski, 1996). Therefore, just as for other forms of knowledge structures (e.g., perceptual categories, semantic concepts, stereotypes; Higgins, 1996), these goal representations can become capable of automatic activation. Moreover, similar principles of automatization should apply: that is, to the extent that the goal representation is consistently and repeatedly activated in the respective situational context, that goal will tend to become activated automatically whenever the person encounters that situation (Shiffrin & Dumais, 1981). In other words, over time the goal representation will develop an automatic association with the features of those situations in which that goal has been repeatedly and consistently chosen and pursued in the past.

Eventually, as with any process receding into the subconscious (Jastrow, 1906), no conscious choice would be necessary; the situational cues would be enough to activate the goal. Ach (1935) even suggested a phase model of this process—which he called *voluntionale Objektion* (or, automation of willing)—in the final phase of which the stimulus has acquired complete command over the goal-directed behavior. As James (1890) argued, the superfluity of conscious choice in this sequence would cause it to drop out of the picture (more recently, see Bargh & Chartrand, 1999). In fact, on the basis of the assumption that goals become automated through their repeated selection in a given situation, such automatic goals should generally be in line with the individual's valued, aspired-to life goals and purposes.

Similarity of Conscious and Nonconscious Goal Effects

Goals that are activated by environmental cues should operate as effectively as when consciously chosen. Chartrand and Bargh (1996) tested the hypothesis that nonconscious activation of information-processing goals would produce the same outcome as conscious pursuit of the same goals. The first experiment was a replication of a classic finding of Hamilton, Katz, and Leirer (1980), in which participants with the explicit goal of forming an impression of the target person had better free recall of the target's behaviors, and also a more thematically organized memory for those behaviors, compared with participants who were instructed to memorize the behaviors. Unlike the original Hamilton et al. study, however, Chartrand and Bargh did not give participants any explicit instructions as to what to do with the presented behavioral information, other than telling them that later they would be asked questions about it.

Instead, the Scrambled Sentence Test priming technique was used (Srull & Wyer, 1979) to activate either the goal of impression formation or of memorization. In this priming task, participants constructed grammatically correct sentences out of sets of five words presented in a scrambled order (e.g., *them tomato evaluate will she*). In the course of this task, on some trials, participants were exposed either to words related to impression formation and judgment (e.g., *evaluate, judge*) in one condition or to words related to memorization (e.g., *retain, absorb*) in the other. Despite there being no difference in the explicit task instructions between the two conditions, the findings replicated those of Hamilton et al. (1980): Those participants who had been previously exposed to impression-related stimuli in the priming task showed significantly higher recall as well as clustering of the behaviors in memory compared with participants primed with stimuli related to memorization.

In Experiment 2, participants engaged in a replication of a standard person memory paradigm (e.g., Hastie & Kumar, 1979). In this paradigm, a series of behaviors either consistent or inconsistent with a given personality trait (e.g., honesty) are presented to participants who are instructed to form an impression of the target person. Participants typically form impressions reflecting the evaluative quality of the behaviors presented (e.g., greater dislike for a target behaving mainly dishonestly than mainly honestly) and also show evidence of forming these impressions on-line while the behavioral information is being acquired, rather than later on the basis of those behaviors they can recall (Bargh & Thein, 1985; Hastie & Park, 1986). However, in the Chartrand and Bargh (1996, Experiment 2) replication, none of the participants were explicitly instructed to form an impression of the target. Instead, one group had been previously primed (subliminally) with words related to impression formation, and a control group was subliminally exposed to words unrelated to impression formation. As predicted, those participants whose impression-formation goal had been subliminally primed (and not the control-group participants) showed the same effects of on-line impression formation as in the previous studies in which participants held a conscious impression-formation goal.

In both experiments, extensive questioning of the participants during debriefing revealed no signs of conscious awareness of the effect that the priming manipulation might have had on the subsequent task. It is important to note that no participant reported having had the goal of memorizing or of impression formation at any time during the experiment; instead participants mentioned purposes in line with the cover story, such as trying to comprehend the presented sentences. These experiments show that primed information-processing goals produce the same outcomes as goals that have been activated by a conscious act of will. It is noteworthy

that these outcomes could not have been produced by a single, "reflex" behavioral response, but only through a pattern of goal-directed cognitive activity that extended over time.

Classic Features of Goal Pursuit

The Chartrand and Bargh (1996) experiments showed that nonconscious goal activation and operation produced the same outcomes as in previous studies in which those goals were explicitly given to the participants through task instructions. But these different outcomes were produced by giving some participants one goal (e.g., impression formation) and the other participants a different goal (e.g., memorization). These studies therefore demonstrate nonconscious goal-activation effects by observing whether people move in the direction of one versus the other specified outcome. Goal pursuit (i.e., striving for the desired outcome), however, is also characterized by content-free features, such as vigorous acting toward goal attainment, persistence in the face of obstacles, and resumption after disruption (Heckhausen, 1991; Lewin, 1926; Wicklund & Gollwitzer, 1982). Accordingly, in several of our present experiments, participants were assigned one and the same task (e.g., to find as many words hidden in a puzzle as they could), but with the goal to perform well activated nonconsciously for some participants and not activated for others. In this way, we were able to hold the content of the task goal constant across all participants so that we could examine the content-free features of nonconscious goal pursuit and be able to compare these to the known content-free features of conscious goal pursuit.

To provide direct empirical support for these a priori arguments concerning the viability of nonconscious goal activation and operation, we conducted five experiments. The first experiment examined whether a goal to perform well can be activated covertly and without the participants' awareness, and, once activated, operate to enhance their performance on an intellectual task—a classic effect of consciously self-set or adopted goals on mere task performance. For example, as Locke and Latham (1990) observed, people with an additional goal to perform well outperform those merely instructed to do their best.

In Experiment 2, we experimentally manipulated both whether the participant had (or did not have) the conscious goal to behave cooperatively and whether this goal was induced nonconsciously (i.e., primed). Participants then played a resource-management game along with a fictitious partner. In this task, the participant played the role of a fisherman who faced a choice between behaving competitively and maximizing profits (through keeping most or all of the fish caught on each trial) or behaving cooperatively and replenishing the stock of fish in the lake (through returning some or most of the fish). Because half of the participants were given explicit instructions to cooperate and half were not, we could assess whether having a concurrent conscious goal in the same direction is necessary for the operation of a nonconscious goal (as was the case in Experiment 1). We also assessed participants' felt levels of intention to cooperate so that we could gauge the extent to which conscious awareness of the pursuit of a primed, nonconscious goal is a prerequisite for goal-priming effects on behavior.

The third experiment was designed to address two potential alternative explanations for such an effect—the first grants that the effect is due to goal activation, but argues that the goal is nonetheless selected consciously, and the second accedes in the view that the effect is nonconscious but contends that it is not goal driven. According to the first alternative account, the priming manipulation causes a differential perception or construal of the situation (i.e., as one that calls for superior performance), with conscious goal selection then based on the differential construal (Mischel et al., 1996, p. 335; Srull, 1997). According to the second alternative, our goal-priming procedure in Experiment 1 may have activated a trait concept of "high achiever," which in turn makes the perceiver more likely to perform well. There is now abundant evidence (see Experiment 3, *The Behavior-Priming Alternative* below) that trait concepts or stereotypes activated in the course of social perception make the perceiver him- or herself more likely to behave in a concordant way. However, one important general quality of goal pursuit is that goal strength increases, rather than decreases, over time until the goal is attained. Both of the perceptually based alternative accounts would predict a decrease in effect (because of decay in construct activation) over time (Higgins, Bargh, & Lombardi, 1985; Wyer & Srull, 1989). Therefore, using a dissociation paradigm, in Experiment 3 we examined the differential immediate and delayed effects of the identical priming manipulation on both perceptual (construal) and behavioral dependent measures.

In Experiments 4 and 5 we assessed whether nonconsciously activated goals produce the same classic qualities of persistence and resumption as are postulated and observed for consciously set goals (e.g., Gollwitzer & Wicklund, 1985; Wicklund & Gollwitzer, 1982). In Experiment 4 we addressed the issue of persistence on a task in the face of a clear obstacle to goal attainment. In Experiment 5 we analyzed the issue of resumption of a task after a lengthy disruption has occurred and participants have a chance to switch to an intrinsically more attractive alternative.

Experiment 1: Automatic Achievement

Method

Participants. Seventy-eight introductory psychology students (30 men, 48 women) at New York University (NYU) participated in the experiment in partial fulfillment of a course research requirement.

Materials and apparatus. Participants were randomly assigned to either a high-performance–goal or a neutral priming condition. The priming manipulation was carried out through an initial word-search puzzle that each participant completed by him- or herself at the beginning of the experimental session. In each of the three forms of the puzzle, a 10 × 10 matrix of letters was presented, below which was a list of 13 words that were embedded in the matrix. Words could appear with letters in a straight line either from left to right or from right to left reading down or reading up, and diagonally reading either down or up. Each list contained the same set of six neutral words to be found (*building, turtle, green, staple, lamp, plant*), with the remaining seven words relevant (or not) to the concept of high performance. In the high-performance–goal priming condition, these words were *win, compete, succeed, strive, attain, achieve,* and *master.* In the neutral priming condition, these words were *ranch, carpet, river, shampoo, robin, hat,* and *window.*

Three experimental word-search puzzles were constructed in a similar manner, which served as the dependent measure of the study. Unlike the priming task, these experimental puzzles did not explicitly list the target words to be found. Each of these puzzles had a separate theme, given at the top of the page containing the letter matrix, so that all of the hidden words were members of that category. The three categories were foods (e.g., *cake,*

peach, eggs, corn, cabbage), bugs (e.g., *roach, mosquito, beetle, moth, butterfly*), and colors (e.g., *red, purple, yellow, orange, tan*). There were 10 words hidden within each puzzle. The dependent variable was the total number of words the participant found in the three experimental word-search puzzles. The order in which the three puzzles were presented was counterbalanced in the design.

Procedure. From 1 to 3 participants took part in each experimental session. They were greeted at a waiting area and escorted to the experimental room, where each was seated in an individual cubicle. The participants first completed the consent form and then opened the envelope and worked on the priming task, with the experimenter unaware of priming condition. When the participants had found all of the 13 words embedded in the letter matrix, the experimenter instructed them to set the priming task aside, take the experimental word-search puzzles out of the envelope, and to begin work on them.[2]

The instructions for the experimental word-search puzzles informed participants that they would have a total of 10 min to find as many members of the categories named at the top of each of the puzzle sheets as they could, and that they could work on the puzzles in any order and go back and forth between them. At the end of the allotted time, the experimenter collected the puzzles and individually debriefed and thanked the participants.

As part of the debriefing, using a funneled questionnaire protocol, the experimenter probed carefully for any suspicions regarding the relation between the original priming task and the experimental task. First the experimenter asked general questions concerning what the participant thought the experiment was about and then whether the participant thought one part or task in the experiment might have affected another part or task. Finally, if the participant had not spontaneously come up with the connection, he or she was directly asked to guess how the original word puzzle could have been related to the later puzzle tasks. No participant indicated any awareness or suspicion that the words on the priming task were related to the subsequent experimental situation.

Results

The number of words found by the participants was analyzed by a 2 (prime) × 2 (gender) analysis of variance (ANOVA). Gender of participant was included as a factor because, historically, gender differences have often been obtained in the manifestation of achievement orientation—at least as it has been classically operationalized and measured (Alper, 1974; Heckhausen, 1991, p. 214; Horner, 1972, 1974; Stewart & Chester, 1982). As predicted, the main effect of prime was reliable, $F(1, 74) = 9.64$, $p = .003$. High-performance–goal primed participants found a mean of 26.0 words, compared with a mean of 21.5 words for participants in the neutral priming condition. Neither the main effect for gender, $F(1, 74) = 2.99$, $p = .09$, nor the interaction, $F(1, 74) = 1.66$, $p = .20$, attained significance.

Discussion

The performing-well–goal priming manipulation was successful in producing enhanced performance on the task. Experiment 1 establishes that performance goals can become activated without the necessity of conscious and deliberate choice and then operate to regulate behavior toward attainment of the desired outcome. All participants faced the same situational pressures and were given identical instructions to find as many words as possible on the task. Yet, when the goal to perform well was activated without their awareness, performance of participants in the experimental condition was substantially better than that of the control group. Importantly, no goal-primed participant evidenced any awareness of the goal-priming manipulation or its potential impact on their subsequent task performance. They did not recognize the connection between the priming and experimental task, and most appeared perplexed by the suggestion during debriefing that the priming task might have influenced their behavior and were surprised when they learned of the experimental hypotheses.

However, that participants were not aware of the activation of the performance goal does not necessarily mean that they were not aware of its operation during the word-search puzzles. What was needed on this point was evidence bearing on the degree to which goal-primed participants were aware of pursuing that goal during the task.

Additionally, one could argue from the design of Experiment 1 that goal-priming effects on behavior might have as a prerequisite a concurrent conscious goal orientation in the same direction. All participants had been instructed to find as many words in the puzzle as possible. Perhaps, then, goal-priming effects "piggyback" on a conscious purpose that is already in place, and can not emerge on their own.

Experiment 2: Automatic Cooperation

Overview

We used a resource-dilemma task (Komorita & Parks, 1995, pp. 195–197) in which participants could harvest from a common resource pool that had to be replenished periodically (i.e., fishing from a lake with a limited number of fish). Participants played against a presumed other participant. The dilemma was that if the participant and the opponent each took out the maximum amount of the resource possible for themselves on each trial, it would quickly run out. In other words, the game allows the participant to either compete against the opponent to gain the highest possible profit, cooperate for the good of all by turning profits back into restocking the resource, or attempt a strategy that would maximize self-profit and common good. Every effort was made to give participants the freedom to choose any strategy they wished; the experimenter took pains not to suggest or imply one approach over the others.

The design of the study was a 2 (priming: none vs. cooperation) × 2 (conscious goal: none vs. cooperation) between-subjects factorial design, and the dependent measure was the participant's degree of replenishing the resource, as measured by the number of fish returned to the lake. After they had completed the task, we assessed the participants' self-reported extent to which they followed the goal of cooperation during the game. With regard to the first issue of whether goal-primed participants are aware of pursuing the goal during the task, the design enabled a comparison of goal-primed versus no-goal-primed participants' subsequent re-

[2] Previous studies using the same performance priming and neutral priming tasks (Bargh & Gollwitzer, 1994, Studies 2 and 3) had found them to be of equivalent difficulty, with no differences in the mean time to completion, $ts < 1$. Thus any obtained performance differences between the two priming conditions on the subsequent word-search puzzles cannot be attributed to the differential difficulties of the priming word-search tasks (e.g., possible motivational differences caused by differences in perceived ability or self-efficacy on the task).

ports of intentions to cooperate during the task and also a test of the degree to which such intentions were related to actual cooperative behavior. With regard to the second issue of whether primed goal operation requires that goal to be concurrently consciously held, the design enables a test of the goal-priming effect in the absence of such a conscious goal.

Method

Participants. Sixty male students at the University of Konstanz participated in return for 7 DM (approximately $4). Mean age of participants was 24.1 years. Two participants were scheduled for each experimental session to bolster the cover story that they would be engaging in a negotiation game with another participant.

Procedure. Participants were taken to individual cubicles, each equipped with a computer that was said to be connected to that of the other participant. On each table, participants found the written instructions for the negotiation task (the fishing game). Before the participants were allowed to begin this task, the experimenter introduced the "psycholinguistic task," explaining that it was a new test being developed by a different professor. This was in actuality the priming manipulation, a variation of the Scrambled Sentence Test (Srull & Wyer, 1979), in which participants constructed grammatically correct four-word sentences from each five-word item. There were a total of 30 items on the test, 10 of which either contained words related to the concept of cooperation (in the experimental condition) or were neutral with respect to cooperation (in the control condition). The cooperation-related primes were *dependable, helpful, support, reasonable, honest, cooperative, fair, friendly, tolerant,* and *share.* The corresponding stimuli on the neutral priming task were *salad, umbrella, city, gasoline, wet, purposeful, switch, lead, mountain,* and *zebra.* Participants were randomly assigned to complete either the cooperative-goal or the neutral priming task.

After they had completed the priming task, participants were given written instructions for the next task, a resource-management game. In these instructions, they were asked to take the role of one of two fishermen licensed to fish a small lake with a total stock of 100 fish. They were told that the rule was that the number of fish in the lake could never go below 70, or else all profits made from prior catches would be confiscated. Several seasons of fishing were played, in each of which the participant always caught 15 fish. He had to decide on each of these trials how much of the catch he would keep for personal profit and how much he would return to the lake to help restock it. Decisions were made based on a table supplied to the participant, which showed the consequences of keeping fish versus replenishing the lake. The table entries giving the effect of returning n fish to the lake on a given trial on the change in the number of fish in the lake were generated from the equation $5n - 30$ (e.g., keeping 7 and returning 8 results in an increase of 10 fish in the lake). In the no-conscious-goal condition, the game was started at this point.

For participants in the conscious-cooperation-goal condition, the written instructions continued by stating that it was important that both participants cooperate in observing and maintaining the critical limit of 70 fish in the lake. They were told to set themselves the following goal: "I intend to cooperate as much as possible."

For each season, the catch of 15 fish was indicated in the middle of the computer screen, with a boat icon on the left and a fish icon on the right. The participant then entered a number into a box next to each icon indicating how many of the 15 would be kept and how many were to be returned to the lake. The computer emitted a distinctive tone as soon as the participant had finished entering his responses; also, at a random point during the trial the computer emitted a different tone, which signaled that the "other participant" had made his choices. After both tones had sounded, the computer showed a message about the updated status of the stock of the lake. The message was always the same: "There continue to be more than 70 fish in the lake." In addition, the participant's total number of fish taken from the lake (i.e., profits) were indicated. Participants were not informed about how many seasons (trials) the game would last. The game was ended after the 5th season; the computer program recorded the total number of fish returned.

Thereafter, participants completed a postexperimental questionnaire with the following three items: "How important was it for you to behave cooperatively during the resource management game?" rated on a scale of 1 (*not important*) to 7 (*very important*), "How successful were you in behaving cooperatively?" rated on scale of 1 (*not successful*) to 7 (*very successful*), and "How committed did you feel to the goal of behaving cooperatively?" rated on a scale of 1 (*not committed*) to 7 (*very committed*). After they had answered these items they were probed for suspicions with respect to a relation between the priming task and the resource-management game. None of the participants gave indications of any awareness of such a relation.

Results and Discussion

The total number of fish returned was analyzed by a 2 (priming condition) × 2 (conscious goal condition) ANOVA. It revealed a main effect for priming, $F(1, 56) = 3.93$, $p = .05$, as well as a main effect for conscious goal, $F(1, 56) = 5.99$, $p < .02$. The interaction was nonsignificant ($F < 1$). As can be seen in Table 1, both the priming and the conscious-goal manipulations were successful in producing cooperative behavior. Not surprisingly, we observed greater cooperation when participants were given the explicit conscious goal to cooperate. More importantly, this effect was also obtained by the goal priming manipulation, providing a second demonstration of nonconscious-goal activation along a different dimension of behavior than in Experiment 1. Moreover, in line with our hypothesis that nonconscious-goal activation does not require the preexistence of a conscious goal in the same direction (the piggybacking issue), participants in the no-conscious-goal condition showed the same increase in cooperation due to goal priming as did participants in the conscious-goal condition.

When we analyzed participants' responses to the three postexperimental questions concerning their experienced intentions to cooperate during the task (Cronbach's $\alpha = .74$), there were no reliable differences as a function of priming or conscious-goal conditions, all Fs < 1.37. The three-item means on the 7-point scale ranged from 4.6 to 5.2, indicating that all participants regardless of priming or conscious-goal condition reported equivalent intentions to cooperate. The lack of a difference on this measure due to priming suggests that participants were not only unaware of the activation of the primed goal, but also of its operation during the experimental situation. However, the lack of

Table 1
Cooperation in Replenishing the Resource, by Goal Priming and Conscious Goal Conditions, Experiment 2

	Conscious goal			
	None		Cooperation	
Primed goal	*M*	*SD*	*M*	*SD*
None	24.9	6.0	32.1	9.8
Cooperation	31.1	9.6	35.1	9.5

Note. Means represent total number of fish returned to the lake.

a difference between those participants explicitly instructed to cooperate (i.e., the conscious-goal condition) and those not given such instructions raises the issue of whether the intention questionnaire was sufficiently sensitive to capture actual differences in the motivation to cooperate during the task.

Therefore, to more fully address the relation between the experienced strength of the intention to cooperate and actual cooperative behavior, we computed within-cell correlations between these two measures. For participants who were not given the conscious goal to cooperate, there was only a small negative relation between self-reported intentions to cooperate and actual amount of cooperation ($r = -.11$ overall, $-.16$ for no-priming condition, $-.10$ for goal-priming condition; all $ps > .25$). Thus there is no evidence to suggest that the goal-priming effect on cooperative behavior was mediated by an effect on conscious intentions to cooperate. With respect to participants in the conscious-goal condition, however, a positive correlation between intentions and behavior was observed (overall $r = .33$, $p < .05$; $r = .21$, $p < .24$ for no-priming condition, $r = .35$, $p < .10$, for goal-priming condition).

Because the number of participants on which these correlations are based is somewhat small, these results should be interpreted with caution. Still, they suggest an important difference between conscious and nonconscious goal pursuit; namely that there may be a relation between one's experienced level of intention and one's actual behavior only when the goal is consciously held. Most importantly, it seems apparent that there is no association between consciously experienced strength of goal intention and the actual effect of goal priming on behavior. However, the positive relation obtained in the conscious-goal condition between self-reported goal strength and actual cooperative behavior allows two different interpretations. On the one hand, this relation is consistent with the notion that perceived strength of goal intention affects the degree to which one acts on that intention (Locke & Latham, 1990); on the other hand, it is possible that participants in the conscious-goal condition are attributing to themselves, in a post hoc manner, the degree of intention based on the amount of cooperative behavior just exerted. Interestingly, without conscious awareness of the goal being pursued, the goal-primed participants apparently could not even do that.

Experiment 3: Dissociating Motivational From Perceptual Accounts

The Construal Alternative

It might be argued that our obtained task-performance differences were produced by means other than nonconscious goal activation. Instead, the priming manipulation could have activated the semantic category of performance (in Experiment 1) or cooperation (in Experiment 2) and thereby influenced the participant's construal or understanding of the requirements of the experimental situation (Kelly, 1955; Mischel, 1973). The priming manipulations used in Experiments 1 and 2 to activate goals are very similar to those that have been used to prime social perceptual constructs, such as honesty, kindness, and shyness, in impression-formation research (e.g., Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). In a large number of studies, such priming manipulations have been shown to produce differential perceptions of ambiguously relevant behavior (Bargh, 1989; Higgins, 1989; Wyer & Srull, 1989). Therefore, it is possible that our participants in Experiment 1 (as compared with the control condition) had interpreted the situation as one calling for a particularly strong performance and on the basis of this different perception made a conscious decision to attain the highest score possible. A similar possibility exists for the cooperation-primed participants in Experiment 2, although the obtained lack of relation between the subsequent self-reports of participants as to their experienced cooperation-goal orientation and their actual amount of cooperative behavior speaks against this possibility. Nevertheless, it must be acknowledged that any such memory-based self-report measure of prior conscious states is not the most sensitive or powerful measure of actual awareness during the experimental tasks (Ericsson & Simon, 1980). Therefore, to provide stronger evidence against the construal alternative, we designed Experiment 3 to rule it out experimentally.

The Behavior-Priming Alternative

A second potential alternative account holds that although the effect on task performance was nonconscious in nature, it was not a motivational or goal effect but rather a priming of a form of behavior (e.g., to work hard). Many studies have now shown that the activation of a trait construct in the course of social perception makes it more likely that the perceiver will behave in a traitlike manner him- or herself (Bargh, Chen, & Burrows, 1996; Chartrand & Bargh, 1999; Dijksterhuis & van Knippenberg, 1998; summary by Dijksterhuis & Bargh, 2001). For example, Bargh et al. (1996, Experiment 1) primed the trait concept of either rudeness or politeness (or neither, in a control condition) and found participants in the first condition significantly most likely to subsequently interrupt a conversation.

The theoretical basis for predicting such effects is the close association or even overlap between perceptual and actional or motor representations for the same type of behavior. This was termed the principle of *ideomotor action* by James (1890) and championed more recently by Berkowitz (1984)—a notion that has received strong support recently from perceptual–motor (Müsseler & Hommel, 1997; Prinz, 1990) and neuropsychological research on action control in both humans and other animals (Jeannerod, 1997; Rizzolatti & Arbib, 1998). Rizzolatti and Arbib (1998), for example, found that the same set of "mirror" neurons in the premotor cortex becomes active in Macaque monkeys when they reach for an object as when they watch the experimenter reach for the same object.

Critically, both of these alternative explanations—construal and behavioral priming—hold that the priming effects observed in the present Experiments 1 and 2 are mediated by the activation of a related perceptual representation. Therefore, it is necessary to demonstrate that our goal-priming manipulation produces its effects in a manner not mediated by perceptual priming. Experiment 3 sought to do so by means of a process dissociation paradigm (Dunn & Kirsner, 1988), which made use of a key qualitative difference between the fate of activated perceptual representations and of motivational tendencies—that the latter, but not the former, increase in strength over time when they are not acted on.

Overview

Given the perceptually based alternative accounts of our findings, the strictest and most conservative test of our hypothesis of direct, unmediated environmental goal activation would be to hypothesize a dissociation between the perceptual and the behavioral consequences of the identical priming manipulation. If the effect of the same independent variable goes in one direction (e.g., decreasing) for one dependent variable as a function of a third variable, and in the opposite direction (e.g., increasing) for the other, then the former cannot be the cause or mediator of the latter (Dunn & Kirsner, 1988). To provide such a test, in Experiment 3 we assessed the time course (the third variable) of the perceptual and the behavioral effects, respectively, of the high-performance–goal priming manipulation of Experiment 1.

According to Atkinson and Birch's (1970) "dynamic theory of action," goal-directed action tendencies consume their strength to the degree they are acted on, reaching their lowest level of activation immediately after the goal is attained. Until the goal is acted on, however, the action tendency is posited to increase in strength over time, thus pressing for realization. Perceptual (and other nonmotivational) constructs, on the other hand, can only remain at the same activation level or decrease in activation over time (Anderson, 1983). For example, in the synapse model of construct accessibility of Higgins et al. (1985), activation declines over time as a negative function of the frequency of use; in the storage bin model of Wyer and Srull (1989), construct accessibility is also said to decline over time, albeit for different theoretical reasons. No model of priming or accessibility effects on perception or construal predicts an increase in effect over time (Bargh, 1994; Higgins, 1989, 1996; Wyer & Srull, 1989).

The dissociation we predicted, if goal-priming effects are not mediated by perceptual construal, is straightforward. The effects of the same priming manipulation should decrease over time for a social–perceptual (impression-formation) dependent variable, but they should increase over time for a dependent variable reflecting goal-directed action tendencies. Experiment 3 was a test of this crossover dissociation prediction. Some participants were initially primed with performance-goal-related stimuli, whereas the other participants were exposed only to neutral words. Then, within each priming condition, some participants worked on the experimental task immediately, whereas the others did so only after a 5-min delay.

The type of experimental task on which participants worked was a key factor in the design. Half of the participants engaged in an impression-formation task, in which they read about a target person described in a way that was ambiguous with regard to his motivation to achieve. On this task, we expected to find the standard effect of delay on priming effects (Bargh, Lombardi, & Higgins, 1988; Higgins et al., 1985): stronger immediately following priming and significantly attenuated (perhaps entirely dissipated) after 5 min.

The other participants completed a word-search task in which they attempted to find as many words among a set of letter tiles from the board game Scrabble (Hasbro, Inc., Providence, RI) as they could. On this task, we predicted the opposite effect of postpriming delay. That is, we expected that although performance-goal-primed participants would find a greater number of words than would nonprimed participants at the short delay (replicating the findings of Experiment 1), this effect would be even greater at the longer delay.

Method

Participants and design. A total of 288 participants (102 men, 186 women) took part in the experiment in partial fulfillment of a course requirement in an NYU introductory psychology course. The design was a 2 (priming: high-performance goal vs. control) × 2 (task: impression formation vs. word search) × 2 (delay: none vs. 5 min) × 2 (gender) between-subjects factorial.

Materials and apparatus. The performance-goal and neutral priming manipulation word-search puzzles were the same as those used in Experiment 1.

The delay manipulation involved having participants draw their family tree as completely as they could. Careful consideration went into the selection of this particular filler task. This task should not itself allow any expression of a performance goal, otherwise goal-primed participants could act on and satisfy the goal during the filler task by means of performing well on it. If that were to occur, it would reduce our chances of observing any goal-priming effect in the delay condition, because the goal, once satisfied, would return to baseline levels of activation (Liberman & Förster, 2000) and lose its impact on subsequent word-search performance. Therefore, in pretesting we sought a task that was involving enough to clear the priming task from working memory but at the same time provided as little opportunity as possible for satisfaction of the primed goal of high performance. Of the various engaging filler tasks considered (math and word puzzles, anagrams, story completion), the family-tree task best satisfied these constraints.

Starting at the bottom of a blank page with their immediate family (father, mother, brothers and sisters) they were to go back generationally as far as possible in naming their ancestors (i.e., maternal and paternal grandparents, great-grandparents, etc.) in the form of a branch diagram. They were told to complete the tree in a horizontal direction as well, if they could; that is, to give uncles, aunts, and cousins.

Two dependent variables were used: one social–perceptual, one behavioral. The perceptual measure was an impression-formation task in which participants read a behavioral description of a target person, designed and pretested to be ambiguous with regard to the target's being a high achiever. The story was patterned after those used in previous studies of priming effects in impression formation (Bargh, Bond, Lombardi, & Tota, 1986; Srull & Wyer, 1979). The story included high-performance–goal related behaviors (e.g., studying all night) that could be understood either as evidence of an achieving nature or instead as due to situational pressures (e.g., not having studied much previously):

> I ran into my old friend Donald last night on the way back to my apartment. He looked a little tired and worn out, so I asked him what he'd been up to. He said that he had just come from a midterm exam in his geography course, and had pulled an all-nighter to cram for it. I asked him how he thought he had done, and he said that he felt really good about it until he asked others in the class how they had done, and everyone felt they did well. But he's getting an A-minus so far, so he probably did okay. We went to get some coffee at a nearby cafe. We started talking about our plans for after graduation, because we are both juniors so it's only a year away now. Donald always had a job lined up with his father's insurance company, but now he was thinking about trying to get into a law or business school. I thought this was pretty funny because he hadn't taken any law or business classes, but Donald thought he had a shot. He said he has a pretty good GPA and he thought he could take all those classes next year. After we finished our coffee and paid our tab, I headed off to my apartment. Donald and I agreed to get together again soon.

The impression rating form on which participants gave their opinion of Donald consisted of six traits, each rated on a scale ranging from 1 (*not at*

all) to 11 (*extremely*). Half of these pertained to the degree to which Donald was a high achiever (*hard-working, competitive, lazy* [reverse scored]) and the other three were achievement-irrelevant filler items (*friendly, considerate*, and *kind*).

The behavioral dependent measure consisted of the same three experimental word-search puzzles used in Experiment 1.

Procedure. Participants were greeted in a waiting area by the experimenter, who escorted them to the experimental room, where they completed the consent form. Next, the experimenter explained that the study would consist of three unrelated tasks. The order in which participants completed the first two was different in the delay and the no-delay conditions. Participants who had been randomly assigned to the no-delay condition were first given the family-tree task to complete; they were told they would have 5 min to complete this task. Next, these participants completed the priming task to which they had been randomly assigned (high performance goal vs. neutral). Participants in the delay condition first completed the priming task to which they had been randomly assigned and then the 5-min family-tree task. Finally, participants completed either the performance (word-search) or the impression-formation task, again depending on to which of these they had been randomly assigned. As in Experiment 1, they had 10 min to complete this task. Participants in the no-delay condition completed the dependent measure immediately following the priming task, whereas those in the delay condition did so 5 min after the priming task.

In all cases, once their third task had been completed, participants were probed by the experimenter following the same procedure as in Experiment 1 for any awareness of or suspicions about the purpose of the study and for any relations they might have noticed between the various tasks. No participant showed any awareness or suspicion of any such relation. Participants were then debriefed as to the hypotheses and purposes of the experiment, and were thanked.

Results and Discussion

Scores on the performance task (number of words found) and impression-formation task (mean rating of the target person on the three achievement-related scales) were standardized (using z scores) prior to analysis. An ANOVA with prime (high performance goal vs. neutral), delay (none vs. 5 min), task (behavioral vs. impression) and gender as the between-subjects factors was conducted on these standardized scores. This analysis revealed a reliable main effect of prime, $F(1, 272) = 10.27$, $p = .002$; a reliable Prime × Task interaction, $F(1, 272) = 7.86$, $p = .005$; and a marginally reliable Delay × Task interaction, $F(1, 272) = 3.48$, $p = .06$. All of these effects were qualified, however, by the predicted Prime × Delay × Task interaction, $F(1, 272) = 5.67$, $p = .018$, which is depicted in Figure 1. All other effects were nonsignificant (Fs < 1).

As can be seen in Figure 1, this three-way interaction is entirely due to the priming condition, in which delay affected impression-formation and word-search performance in opposite directions, a simple Task × Delay interaction, $F(1, 272) = 7.72$, $p < .01$, with no effect of delay in the neutral priming condition (Fs < 1). Replicating previous trait-concept and goal-priming studies, the priming effects on both impression-formation and word-search performance are equally strong at no delay, with a simple main effect of Prime: $F(1, 272) = 4.76$, $p < .04$, simple Task × Delay interaction ($F < 1$); one-tailed $t(57) = 2.06$, $p < .025$, for impression-formation task; $t(82) = 1.72$, $p < .04$, for the word-search task. Most importantly for the present hypotheses, however, primed participants' achievement-related impressions of the target person became less extreme over time, $t(57) = 1.83$, $p < .04$,

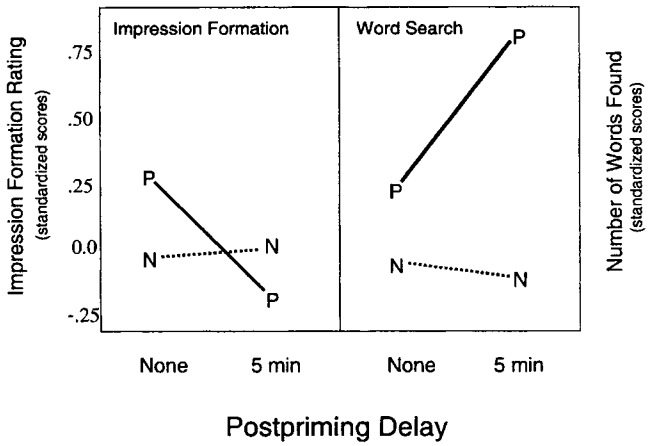

Figure 1. Mean impression rating of target person's achievement orientation in judgment task in standard units (left panel) and mean number of words found in performance task in standard units (right panel) by priming condition (P = high-performance goal, N = neutral) and postpriming delay, Experiment 3.

whereas the performance of primed participants on the word-search task increased over time, $t(91) = 2.50$, $p < .01$.

The absence of any increase in performance as a function of delay in the neutral priming condition argues against any role played by the filler (family-tree) task in generating the performance increase obtained in the goal-priming condition. If the filler task had itself somehow contributed to a performance orientation, this effect should have been seen in the neutral priming condition as well. Rather, the filler task evidently was not relevant to performance concerns, and thus permitted the increase over time in task performance in the goal-primed condition.

These results show, in line with many previous priming studies in the impression formation literature, that the perceptual effects of priming decay over time. Participants primed with high-performance–goal related stimuli who were assigned to the impression-formation task considered the target person to be more of a high achiever than did control participants. As expected, this effect completely vanished after a 5-min delay. Moreover, replicating our previous findings, we observed in the word-search-task condition an immediate effect of priming on task performance. However, in line with our hypothesized dissociation between the perceptual and the motivational effects of performance priming, this priming effect significantly increased after the 5-min delay.

Given that the effect of the priming manipulation over time on the perceptual task was in the opposite direction to that on the performance task, the priming effects on task performance here as well as in Experiments 1 and 2 were unlikely to have been mediated by an activated perceptual, nonmotivational construct. Rather, the results of Experiment 3 suggest that the increased performance in the high-performance–goal priming condition was due to the nonconscious activation of the goal to perform well.

Experiment 4: Persistence in the Face of Obstacles

Our argument is that nonconsciously triggered goal pursuits carry critical features of consciously guided goal pursuits. The

latter have unique properties as pointed to by different theories and research programs (see summaries by Atkinson & Birch, 1970; Bandura, 1990; Gollwitzer, 1990; Gollwitzer & Bargh, 1996; Gollwitzer & Moskowitz, 1996; Heckhausen, 1991; Kuhl, 1986; Lewin, 1951; Pervin, 1989; Wicklund & Gollwitzer, 1982). One hallmark of conscious goal pursuit is that the individual will persist on the task, striving for the desired goal, in spite of obstacles.

In Experiment 4, we again primed participants (or not) with stimuli related to high performance and then had them work on a word-finding task. But in a departure from our previous experiments using this experimental task (Experiments 1 and 3, in which participants were given 10 min to find words), participants were told to stop working on the task after 2 min, through the room-to-room intercom system. We used this shorter time period so that performance-primed participants could not satisfy the primed goal to perform at a high level, so that this goal would still be active at the time of the stop signal. Unbeknownst to participants, they were being watched by means of a hidden video camera positioned at the front of the room. The dependent measure was whether the participant continued to work on the task, trying for even higher task performance (i.e., the total number of words found), after the stop signal had been given.

Note that the primed goal—to perform well on the task by finding the highest number of words—would be in conflict with the experimental instructions to stop working on the task. Our hypothesis was that the automatic, unintended operation of the goal to perform well would cause participants to persevere on the task, despite this obstacle, and so be more likely than unprimed participants to continue working after the stop signal had been given.

Method

Participants. Seventy-six students (26 men, 50 women) enrolled in introductory psychology at NYU took part in the experiment in partial fulfillment of a course requirement.

Materials and apparatus. The high-performance–goal and neutral priming manipulations were the same as those used in Experiment 1. The dependent measure, a variation of the board game Scrabble, consisted of eight wooden pieces, each with a different letter embossed on it. Participants received the same set of five consonants and three vowels, and from this set they were to construct as many different English words as they could, writing them down on a response sheet with 40 numbered spaces for answers.

The experimental room was composed of three desks facing the front of the room, divided by partitions so that participants could not see each other, but so that the experimenter could see each participant. There was an intercom mounted on the wall behind the desks. The experimenter sat at the other end of the 5 m × 3.8 m room at a large desk. Next to and behind the experimenter's desk was a small bookshelf containing various books and slide-projector equipment. One of the slide carousel boxes was placed upright along with the books; this box actually contained a video camera directed at the three participant desks. The camera lens was positioned behind a square of black mesh so that it was effectively hidden from view. The camera was connected to a monitor in an adjacent control room and to a video recorder that recorded each experimental session. Also in the control room was an intercom unit that could be used to communicate with the participants in the experimental room.

Procedure. From 1 to 3 participants took part in each experimental session. They were greeted in a nearby waiting area by the experimenter and shown into the experimental room. First, they completed the consent form. As they were completing it, the experimenter told them that she was running another study simultaneously, and would be in and out of the room during the session. At this point, the experimenter left the room to turn on the video recorder in the control room.

The experimenter returned and placed the priming task (word-search puzzle) face down on each of the participants' desks. The high-performance–goal priming and neutral priming versions of the puzzle had been shuffled together in a random order, and this single stack of puzzle forms had been placed face down on the experimenter's desk by a third person, so that the experimenter was not aware of which version of the priming task was given to which participant in a session. The experimenter explained that the participants would be engaging in two tasks, the first a word-search puzzle, and the second a variation on the game of Scrabble in which they were to make words out of letter pieces. Participants completed the word-search puzzle, and when they all had finished, the experimenter collected the puzzles and distributed the response sheets for the next task.

At this point, each participant was given one of three identical sets of eight letter pieces and was instructed to construct as many words as possible within 2 min. The experimenter also told participants that unlike the board game of Scrabble, it did not matter how long the words were, or whether the more difficult letters (indicated by point values in a corner of each wooden letter tile) were used in the words—all that mattered was the total number of words they could list.

Next, the experimenter said that she would now have to go check on the other study being run at the same time, and that if the 2-min time limit had expired before she could return, time would be called over the room's intercom. The experimenter told participants to begin and left the room, shutting the door behind her. Going to the control room, the experimenter waited the 2 min and then said "stop" in a clear voice over the intercom. She then waited an additional 3 min before returning to the experimental room—during this time the video recorder continued to record the participants' behavior. On the experimenter's return the response sheets were collected and the participants were debriefed, questioned for suspiciousness following the same procedure as in the previous experiments (no participant showed any awareness or suspicions concerning the priming procedure or experimental hypotheses), and thanked.

Results and Discussion

The videotapes were coded for whether or not each participant stopped working on the Scrabble word-finding task when the signal to stop was delivered over the intercom. Continuing on the task was operationally defined as looking for and writing down a new word after the signal—if a participant had been writing a word before the stop command and completed it afterwards, this was not taken as continuing past the signal.

The proportions of participants who persisted on the task past the instructions to stop were analyzed with a Prime (high-performance goal versus neutral) × Gender ANOVA. This analysis revealed only the predicted main effect for prime, $F(1, 75) = 10.36, p = .002$; for all other effects, $F < 1$. A substantially greater proportion of participants in the high-performance–goal priming condition (57%) than in the neutral priming condition (22%) continued to work on the task after the stop signal was given.

The results are consistent with the hypothesis that the nonconsciously activated goal to perform well causes participants to be more likely to persevere in the face of obstacles to achieve higher task performance. Note that if we had not prevented participants from attaining superior performance on the word-search task through giving them insufficient time to find many words, we would not have expected differences in persistence after the stop signal—the goal to perform well would have been satisfied and

therefore dissipated in strength (Atkinson & Birch, 1970; Liberman & Förster, 2000). Moreover, it is difficult to account in nonmotivational terms for the greater persistence evidenced by the participants in the high-performance–goal priming condition in nonmotivational terms. The strength of this persistence effect is underscored by the relatively unimportant task that participants were pursuing—finding words out of letters in an experiment. That such strong tendencies to persist were obtained on this task, given that it was of only moderate self-relevance to the participants, speaks to the strength of the goal to perform well produced by our priming manipulation. Moreover, in the present experiment the explicit instructions to stop on the intercom signal should have generated a consciously held goal to stop working on the task at that point. Nonetheless, the nonconsciously activated performance goal managed to unfold its effects in the face of this presumed antagonistic conscious goal.

Experiment 5: Resumption of Interrupted Goals

Another classic quality of goal pursuit is the high probability of resumption after task disruption (Gollwitzer & Liu, 1995; Lewin, 1935, p. 60, 1951; Mahler, 1933; Ovsiankina, 1928). Self-completion theory (Wicklund & Gollwitzer, 1982) proposes that a person's readiness to resume an interrupted activity is the premier indicator of high goal commitment. Accordingly, in Experiment 5 we tested whether nonconsciously activated goal pursuits also acquire this tendency to be resumed. This would demonstrate that nonconsciously pursued goals are also associated with high commitment, because the person goes back to the task to see it completed (i.e., attain the goal).

We again used the Scrabble word task in Experiment 5, using an interruption paradigm (Adler & Kounin, 1939; Cartwright, 1942; Henle & Aull, 1953; Ovsiankina, 1928; Torrey, 1949) in which participants could return to this relatively intellectually demanding task or instead move on to an activity that is more fun. We chose a nonperformance-related alternative task that was fun to perform so as to exclude the possibility that participants returned to the original task simply because they enjoyed working on it and not because of meeting the nonconscious goal to perform well (Ovsiankina, 1928). Our prediction was that the nonconsciously activated goal to perform well would result in a greater tendency to resume the word-finding task, foregoing the more enjoyable alternative activity.

Method

Participants. Sixty-five undergraduate NYU students participated in the experiment in return for partial course credit in an introductory psychology course. Data from 3 participants who indicated suspicion about the interruption manipulation during postexperimental debriefing were excluded. Of the remaining 62 participants, 36 were female and 26 were male.

Apparatus and materials. The high-performance–goal and neutral priming stimuli were presented to participants in the context of word-search puzzles, the same as used in Experiments 1, 3, and 4.

The Scrabble word-construction task was again used as a challenging intellectual task. We selected a cartoon-rating task as a potential attractive alternative task. A pretest was conducted to determine the degree of enjoyment of working on each task. A separate sample of 20 participants rated each task as to which one they would prefer to do, on a scale from −4 (*not at all enjoyable*) to 4 (*very enjoyable*). Judging the degree of humor of a set series of cartoons ($M = 2.5$) was anticipated to be significantly more enjoyable than forming words from Scrabble letter tiles ($M = 1.2$), $t(18) = 2.32$, $p < .04$.

The Scrabble and cartoon tasks were both presented to participants by means of an overhead projector, which cast images onto a white wall panel 2.8 m away. The projector was connected to a switch that was taped securely to the inside of the desk at which the experimenter was seated. This switch was, in turn, plugged into an outlet behind the experimenter and was positioned so that it could be turned off without the participants noticing. The only lighting in the room was by a dimly lit table lamp that was kept on during the entire session.

Procedure. Each participant was greeted by one of two experimenters and shown into the experimental room. The experimenter informed the participant that the study concerned language ability and that the participant would work on two separate and unrelated tasks. On completing the consent form, the participant was given a word-search puzzle (either the high-performance–goal or the neutral priming manipulation) under the guise of a practice session for the first task. After the participant had completed the priming task, the experimenter introduced the Scrabble word-construction task.

As in the previous experiment, each participant was instructed to write down as many words as he or she could create from the set of seven letters shown on the overhead projector. All participants saw the same set of seven letters. The participant was instructed to signal the experimenter when he or she felt that all possible words had been found. After these instructions had been given, the experimenter turned on the overhead projector to begin the task.

We disrupted participants very early on (i.e., 1 min later). The experimenter surreptitiously turned off the projector by means of the switch hidden under the desk and feigned surprise at the apparent failure of the overhead equipment (i.e., accidental disruption; Ovsiankina, 1928). After making an attempt to fix the equipment, the experimenter concluded out loud to the participant that the projector bulb had burned out, and she left the room to find a replacement. She instructed the participant at this point to refrain from writing down any more words while she was gone.

After 5 min, the experimenter returned with another bulb and proceeded to fix the projector. At this point, it was explained to the participant that because of the unforeseen delay, there was not enough time to complete both tasks during the session. The participant was thus given the choice of which task to work on—resuming the Scrabble task or going on to the next task, which involved judging cartoons for how funny they were. This choice was recorded by the experimenter, and the participant proceeded to work on his or her chosen task.

At the end of the session, all participants were questioned by the experimenter for any awareness of or suspicion that the priming task had affected their performance of the subsequent task or tasks. Finally, the experimenter fully debriefed the participant as to the purpose of the study.

Results and Discussion

The dependent variable was the participant's choice of task following the interruption: the Scrabble word-construction task on which they had already started or the objectively more enjoyable cartoon-humor rating task. An ANOVA was conducted with prime (high-performance goal vs. neutral) and participant gender as the independent variables. This analysis revealed a reliable main effect of prime, $F(1, 58) = 6.63$, $p < .02$. As predicted, a considerably higher proportion of high-performance–goal primed participants (66%) chose to continue working on the interrupted Scrabble task than did nonprimed participants (32%). This effect of high-performance–goal priming was not different for men and women, Prime × Gender $F < 1$. A hypothesis-irrelevant main effect for

Gender was also obtained, $F(1, 58) = 5.37$, $p = .02$, such that overall more women than men chose the Scrabble task.

Participants with a nonconscious goal to attain high performance were considerably more likely to return to the incomplete intellectual task after the interruption than were nonprimed participants. This finding replicates the classic finding of Ovsiankina (1928) in the case of conscious goal pursuit.

General Discussion

Taken together, the results of the five experiments support the proposal that behavioral goals can become activated without any consciously made choice required. Once activated, these nonconscious goals operate in ways known for consciously chosen goals. They promote goal-directed action (achievement in Experiment 1, cooperation in Experiment 2), they increase in strength until acted on (Experiment 3), they produce persistence at task performance in the face of obstacles (Experiment 4), and they favor resumption of disrupted tasks even in the presence of more attractive alternatives (Experiment 5).

The Interplay of Conscious and Nonconscious Goal Pursuit

In four of the experiments, participants were given the explicit goal of finding as many words as possible on puzzle tasks. Through goal-priming manipulations, some participants had the nonconscious goal to perform the assigned task well. For these participants, then, the nonconscious goal was superimposed on an already activated parallel conscious task goal. Nevertheless, the nonconsciously activated higher order goal (to perform well) managed to significantly affect task performance in the direction of the goal.

One should not conclude from this, however, that nonconscious-goal effects always require as a necessary condition an already operating conscious goal to perform the given task. In Experiment 2, the primed goal of cooperation affected participants' behavior in the no-conscious-goal condition even though the task was described in a manner that left open how it could be performed—competitively, cooperatively, or a mixture of the two. As it turned out, the goal-priming effect on cooperative behavior did not differ in its strength when there was a concurrent explicit goal to cooperate versus when there was not. Similarly, participants in the Chartrand and Bargh (1996) experiments were not given any explicit instructions (i.e., a conscious goal) to process social information in a particular way, only to read the behaviors because questions about them would be asked later. Participants nevertheless pursued the induced nonconscious goal either to form impressions or to memorize the target behaviors.

Nonconscious goals do not always operate in an environment in which they are in harmony with current conscious purposes, of course. Often they are in conflict with other, ongoing influences and purposes, some of them even nonconscious as well. Moskowitz et al. (1999) examined the interaction of chronic goals to be egalitarian and fair-minded toward members of minority groups, with the automatic activation of stereotypes concerning those groups. In two studies using a sequential priming paradigm, participants with a chronic (automatically activated) fairness goal managed to inhibit the expression of automatically activated stereotypic beliefs.

Nonconscious Goal Setting Versus Nonconscious Goal Pursuit

For the most part, the present studies focused on the question of whether performance and cooperation goals could be activated outside of conscious choice and awareness to then operate in ways similar to when those goals are pursued deliberately and consciously. It was clear from the extensive questioning of participants during debriefing that they had not become aware of the activation and setting of the performance or cooperation goal. However, this does not mean that participants could not have become aware of their pursuit of these goals at some point during performance of the experimental tasks.

Experiment 2 speaks to the issue of the conscious awareness of the operation of a primed goal. In that study, participants primed with the goal to cooperate made significantly more cooperative responses than did nonprimed participants, and those given the explicit conscious cooperation instructions did cooperate more than did those without such a conscious goal. After completing the resource-management task, participants' self-reports of the degree to which they had intended to cooperate during the task were collected and related to the actual levels of cooperative behavior they had shown.

Critically, only those participants given the conscious goal to cooperate showed a relation between their felt strength of intention to cooperate during the task and their observed levels of cooperative behavior. The self-reported intentions of participants with a nonconsciously held goal to cooperate were unrelated to their actual cooperation, even though these participants showed a nonconscious cooperation-goal effect on their behavior. These findings suggest that nonconscious-goal effects on behavior do not require the individual to become consciously aware of the fact that this goal is being pursued in the situation. They also support the notion that participants who are unaware of the activation of nonconscious goals will remain unaware of their subsequent operation to guide behavior.

In addition, these findings seem to suggest that one will judge the strength of one's goal intention to be in line with the amount of exerted goal-directed behavior only if one is aware of the goal intention to begin with (i.e., the conscious goal condition). In other words, an ongoing behavior needs to be identified as serving a certain goal so that the intensity of behavioral exertion may be taken retrospectively by the individual as an indication of his or her goal strength. The construction of one's own degree of intentionality based on the amount of behavior exerted, therefore, would seem possible only when one knew all along what one was attempting to do.

It seems to us that this may be an important difference between conscious and nonconscious goal pursuit. Being consciously aware of the purpose of one's actions puts a person in a better position to reflect on the implications of achieved outcomes. For instance, the inference that one is a cooperative person may be more likely following conscious pursuit of the goal of cooperation than when the identical outcomes are produced on the basis of nonconsciously operating cooperation goals.

Putting Perception-Behavior Effects in a Motivational Perspective

The present findings of nonconsciously produced superior task performance bear similarity to recently reported priming effects on behavior (Dijksterhuis & Bargh, 2001), predicted from the hypothesis of a direct and passive connection between perception and social behavior (e.g., Berkowitz, 1984). In this regard, it is noteworthy that the present studies used achievement- or cooperation-related words as priming stimuli, and by doing so managed to activate outside of awareness the goal to perform well or to cooperate, respectively. Accordingly, it would seem that any stimulus related to a given concept will activate not only the semantic features of the concept, but also dynamic properties such as goals and plans related to the concept. For instance, using *achievement* as a prime activates not only related concepts such as success, effort, pride, and so on, but also the intention to do well, to find solutions to problems, and to overcome obstacles in the way.

This suggests a second manner in which goals can be activated nonconsciously. We have assumed thus far that goal representations become linked to representations of those situations in which the goal has been pursued often in the past (Bargh, 1990). However, it seems probable that representations of types of people, such as professors (Dijksterhuis & van Knippenberg, 1998), and stereotypes, such as for the elderly (Bargh et al., 1996), contain knowledge of the goals and intentions of those people, and thus the activation of these representations in the course of perception might also activate those goals and intentions. If so, the observed priming effects on behavior previously ascribed to the activation of perceptual constructs alone may have been caused instead by the conjoint activation of perceptual and dynamic concepts.

The possible involvement of goal-construct activation in perception–behavior priming effects may help take some of the mystery out of behavior-priming effects that unfold over time; for example, participants walking slowly when leaving the experimental session after being primed with elderly stereotypic content (Bargh et al., 1996) or answering a greater number of Trivial Pursuit questions after being primed with professor stereotypic content (Dijksterhuis & van Knippenberg, 1998). The explanation of these findings in terms of the nonconscious activation of single behavioral responses as a consequence of related perceptual activity is not entirely free of difficulty—that is, what is the "behavior" that is activated by the professor stereotype that causes superior test performance? However, the present findings of nonconscious goal pursuit, which operates over time in interaction with environmental events and information, provide a possible additional mechanism for such effects. For example, the professor stereotype might include goals typically ascribed to professors, such as a desire to do intellectual work and the determination to solve problems and find correct solutions, and these activated goals might then guide performance over time on the experimental task.

The Adaptiveness of Nonconscious Goal Pursuit

We believe that in general nonconscious goal pursuit is adaptive because it keeps the individual tied to the present, freeing conscious processing to ponder the past or plan for the future. As James (1890) noted, "the more of the details of our daily life we can hand over to the effortless custody of automatism, the more our higher powers of mind will be set free for their own proper work" (p. 122). These higher powers can of course be used for on-line goal setting and guidance in the present, but they can also serve to reflect on past experiences and to prepare for future ones.

In goal pursuit that is linked to the here and now through the automatic activation of internal goal representations, the cause of the resultant behavior is inherently interactional—not caused by either situation or person in isolation, but by their combination. In other words, behavior guided by nonconscious goals is not "habit" as conceptualized in behaviorist stimulus–response models of environmentally guided action (Bargh, 2001; Bargh & Ferguson, 2000; Skinner, 1938) in the sense of single and inflexible behavioral responses to single environmental events, but instead is behavior that is flexibly responding to environmental events as they unfold in the ongoing situation. In the present experiments, the effects of the primed performance goals were obtained over an extended time period, over the course of a given task, and in response to novel—not routinized—task demands.

The more general question is how exactly nonconsciously activated goals operate in complex and uncertain environments to produce their outcomes. Certainly the activation not only of the goal itself but also of the relevant subgoals, plans, and strategies to attain the goal is necessary—that is, the entire goal system would have to become engaged (e.g., Carver & Scheier, 2000; Shah & Kruglanski, 2000). The mental representations corresponding to these plans and strategies would have perceptual as well as behavioral components to be sensitive to and flexibly guide responses in line with ongoing environmental events. In the present experiments, the goal to perform well or to cooperate was active and operating in a relatively novel task environment, yet participants were able to pursue the respective goals.

Because of the limitations of conscious processing, and the strain on these limited resources in times of difficult self-regulation tasks, to shift the regulation of goal pursuit from conscious control to automatic control can be an adaptive way of ensuring effective goal pursuit even under new, complex, or difficult circumstances. For one thing, automatic regulation of one's goal pursuits should not be subject to the startling limitations recently discovered for self-control resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998). Automatic goal pursuit should also be a particularly reliable means of ensuring goal attainment, because it does not depend on the additional, and often uncertain, step of conscious decision making and attentional guidance at the moment of truth.

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