

## The Nonconscious Cessation of Goal Pursuit: When Goals and Negative Affect Are Coactivated

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Extending on the recent investigation into the implicit affective processes underlying motivation and decision making, 5 studies examined the role of negative affect in moderating goal priming effects. Specifically, experimental effects on measures that typify motivational qualities of goal systems, such as keeping a goal at a heightened level of mental accessibility and exerting effort to work for a goal and experiencing desire to attain the goal, showed that the motivation and resultant operation of social goals cease when these goals are primed in temporal proximity of negatively valenced information. These goal cessation effects resulting from the mere coactivation of a goal and negative affect are discussed against the background of present research on nonconscious goal pursuit and the role of accessibility and desirability in the regulation of automatic goal-directed behavior.

*Keywords:* goals, priming, nonconscious, negative affect, motivation

Human behavior is motivated by goals. Modern views consider people's goal pursuits to be governed by consciousness. We all tend to agree that goal setting is characterized by a conscious reflection process and that goal striving is associated with conscious intent. This ubiquitous belief in conscious goal pursuit, however, led modern research to ignore one of the most intriguing and important issues: Where do our goal pursuits actually come from, and how do they emerge? Though we might be conscious of our goals, it is not always clear what causes us to pursue a goal or not. Specifically, as our thinking and doing are produced by brain processes that are not open to introspection, we are often unconscious of the processes underlying our thoughts and motivated behaviors (Blackmore, 2003; Nisbett & Wilson, 1977; Nørretranders, 1991). This raises the possibility that goal pursuits can be triggered by the environment and are guided by unconscious processes (Bargh, 1990; Wegner, 2002; Wilson, 2002).

In the last decade, researchers have begun to empirically explore this idea. Several lines of experimentation have led to the discovery that a variety of social goals, such as cooperation, making money, and socializing, are nonconsciously triggered by environmental cues and direct and motivate our thinking and doing in line

with the goals (Aarts, Chartrand et al., 2005; Aarts, Gollwitzer, & Hassin, 2004; Bargh, Gollwitzer, Lee Chai, Barndollar, & Trötschel, 2001; Fitzsimons & Bargh, 2003; Moskowitz, Li, & Kirk, 2004; Sheeran et al., 2005). Although the evidence for nonconscious goal pursuit is well documented, it is less clear how the mental system motivates and directs people to either pursue a primed goal or not. The present study aims to address this question. Following recent work on implicit affective processes in decision making and goal pursuit (Bechara, Damasio, & Damasio, 2000; Custers & Aarts, 2005b; Ferguson & Bargh, 2004b; Winkielman, Berridge, & Wilbarger, 2005), we analyzed how priming of a goal concept produces motivational activity in cognition and behavior and tested how this activity is modulated if the goal is coactivated with negative affect. In particular, we propose and aim to demonstrate that the desire of a goal is automatically reduced and goal seeking is automatically stopped as a consequence of nonconsciously priming the goal in temporal proximity of the activation of negative affect. Studying the changes in the affective-motivational context surrounding goal priming, we believe, may open new ways to explore how the mental system regulates the motivation and resultant operation of goal pursuit outside conscious awareness.<sup>1</sup>

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<sup>1</sup> Affect can be conceptualized as a quality or valence assigned to an entity (e.g., Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Zajonc, 1980), but it may also be viewed as a feeling state or emotion that people consciously experience (e.g., Isen & Diamond, 1989; Russell, 2003). Throughout the present article, we use the term *affect* in line with the former conceptualization of basic affective reactions, unless otherwise mentioned.

### Priming and Nonconscious Goal Pursuit

Present theory on nonconscious goal pursuit assumes that goal priming effects on motivated cognition and behavior occur because the given goal is mentally represented as a desired state that preexists in a person's mind (Aarts & Dijksterhuis, 2000; Bargh, 1990; Kruglanski et al., 2002). In other words, one can only prime goals when they are there. These preexisting goals are part of a goal system, including knowledge of the goal itself, actions, and opportunities as well as situational features related to the goal. Conceptualizing goals as desired states suggests the operation of two informational features that are not always clearly distinguished in research on nonconscious goal pursuit: a cognitive one and an affective-motivational one (Aarts et al., in press). The cognitive feature contains the representation of the state that serves as a standard or reference point at which the goal system is directed to pursue the goal. The affective-motivational feature provides the signal of whether the state is desired and worth striving for. Thus, nonconscious goal pursuit does not only depend on the accessibility of the representation of a goal but also on the desirability motivating the recruitment of resources to pursue it.

Past research has mainly, but effectively, studied accessibility of goal representations as the critical condition causing nonconscious goal pursuit. Supraliminal as well as subliminal exposure to goal-relevant information have been shown to produce motivational effects that are typical for the operation of goal systems, such as sustained activation of the goal in memory, inhibition of other goals that compete for attention in the given goal system, and enhanced effort to work for the goal (for reviews, e.g., Custers & Aarts, 2005a; Moskowitz et al., 2004). Recently, we started to explore the interactive contributions of accessibility and desirability of goal states in implicit processes of motivated, goal-directed behavior. On the basis of the notion that positive affect plays a primary role in motivating goal-directed behavior (Carver & Scheier, 1981; Peak, 1955; Pervin, 1982; Tesser, Martin, & Cornell, 1996), we proposed that the desire or motivational value of a primed goal state is automatically signaled by the positive valence attached to the goal (Custers & Aarts, 2005b; in press).

To test this idea, we examined whether neutral behavioral states operate as goals if these states are linked to positive affect. In one study, the valence of the behavioral concept of doing puzzles was rendered more positive by exposing participants subliminally to prime words representing the behavior. The prime word was briefly followed by positive stimuli (e.g., *friend*, *summer*). Results showed that, similar to consciously provided goals, this nonconscious positive shaping (or creation) of goals enhanced participants' effort to work for the goal. Subsequent studies revealed that subliminal priming effects on motivated behavior were more pronounced when the primed concept preexisted as a desired state associated with positive affect in participants' minds. These findings indicate that affect forms a basic part of the representation and motivation of nonconsciously activated goals. Thus, priming the goal representation triggers the motivation system and renders the goal operational.

The findings presented above are in agreement with data in neuroscience showing that the mesolimbic dopamine system, particularly the nucleus accumbens, is associated with positively motivated behavior (Robbins & Everitt, 1996; Salamone, Correa, Mingote, & Weber, 2005; Schultz, 1998; Wightman & Robinson, 2002). The dopamine system is known to respond very rapidly to

delivery of rewards or engaging in behavioral states that evoke positive affect, such as eating food and making money. However, this motivation system is also activated instantly by cues referring to desired states, which shows that priming goal representations sets off neurological processes that are crucial for motivated behavior. The dopamine system therefore acts as an amplifier of goal-related information passing through from various cortical and subcortical areas. Activation of this system is thought to encode the desire of the goal and to guide mental and behavioral processes supporting goal pursuit (Berridge, 2001; Joel, 1999; Marie & Defer, 2003; Salamone et al., 2005). Individuals, then, can tune the motivation and operation of a primed goal without conscious intervention, based on fast (affective-motivational) information processing in the brain.

### Nonconscious Cessation of Goal Pursuit and the Coactivation With Negative Affect

Several researchers have noted that humans may cease their goal pursuits when their goals are regularly followed by cues of events evoking negative affect. For example, people experience negative affect when they fail in their goal pursuits. Failure events elicit a variety of distinct negative emotional responses, depending on the standard and orientation a person has established to achieve the goal (Carver & Scheier, 1998; Higgins, 1998; Martin & Tesser, 1996). The negative emotions deriving from the impedimental experiences may cause people to reformulate and work harder on their goals until the negative goal cues become a recurrent issue and disengaging from the goal may be more beneficial. Other researchers have proposed that negative affect accompanying the activation of goal representations can also readily reduce the desire of the goal (e.g., Aarts et al., 2004; De Houwer, Thomas, & Baeyens, 2001). Such negative cues can take different forms and arise from many sources. For example, one may anticipate the danger of ending up with the usual hangover when having the goal of going out and socializing; lose appetite when one learns that one's favorite Sushi-King meal is also ordered by several disliked persons; or be less eager to earn a greater salary when one observes how someone repeatedly tries to make money by exploiting the poor. More generally, the pursuits of a desired goal (e.g., socializing, eating sushi, earning money) are shelved as a result of (repeated) negative evaluations during activation of the goal.

The cessation of goals alluded to above suggests that negative affect dismisses the desire and operation of goals by an act of conscious will. Thus, people decide not to waste energy in keeping a goal alive and recruit resources for goals that are no longer considered to be desirable or expected to be worth striving for (Carver, 2004; Klinger, 1975). Despite this emphasis on conscious intent in guiding goal pursuit in the course of experiencing negative feelings, however, it is possible that negative affect directly ceases nonconscious goal pursuit by moderating the desire and operation of personal goals without conscious intervention. Reducing the desire of a preexisting goal that recurrently coactivates with negative affect is adaptive in weakening the goal's influence when potentially inappropriate, and hence, such a process may be automated. This motivation reduction mechanism may be especially effective in guiding goal systems when awareness of the activation of one's goals is lacking. In the present study, we aim to explore this idea. Specifically, we propose and test that the desire of a preexisting goal that is nonconsciously activated in temporal

proximity of the activation of negative affect is reduced, which, in turn, ceases the operation of that goal automatically.

Our ideas build on research suggesting that affective processes can moderate motivated human action without reaching conscious awareness (Damasio, 1994; Dijksterhuis & Aarts, 2003; Fazio, 2001; LeDoux, 1996; Zajonc, 1980). Furthermore, several theorists have argued that affect is not one single dimension that ranges from good to bad but consists of two separate dimensions—a positive and negative one—that independently contribute to motivation and behavior in opposite directions (e.g., Cacioppo & Berntson, 1999; Gray, 1987; Lang, 1995; Schneirla, 1959; Watson & Clark, 1992; Watt, 1998). There is common ground to suggest that positive affect is associated with the preparation and motivation of action, whereas negative affect attached to goal pursuits reduces the motivation of the goal and puts it on hold.<sup>2</sup> Extrapolating from this view, we posit that negative affect ceases the operation of a primed goal as a result of the motivational reduction of the given goal. Specifically, priming the representation of a preexisting (positive) goal triggers the motivation system and renders the goal operational as a desired state (Custers & Aarts, 2005a). However, the motivation or desire of that very goal dwindles if that goal is recurrently coactivated with negative affect, ceasing the operation of the goal. In that case, people are less likely to keep that goal mentally alive, do not exhibit instrumental behavior when given the opportunity to attain the goal, and experience less desire to pursue the goal.

There is some evidence supporting this possibility. Recent studies on the role of negative information in modulating the activity in the dopamine system provide initial clues for our ideas. Although the neurological basis is not yet fully delineated, it appears that negative affect following the activation of a goal changes the effects of dopamine functioning in subcortical and cortical brain circuits involved in goal pursuit (Besson & Louilot, 1995; Delgado, Nystrom, Fissell, Noll, & Fiez, 2000; Gottfried, O'Doherty, & Dolan, 2002; Rotzinger, Bush, & Vaccarino, 2002; Zahm, 2000). In a study conducted by Delgado and colleagues (2000), for example, participants were given the goal to guess whether the value of a card was lower or higher than the number 5. Each guess was directly followed by a monetary reward or punishment. By using a baseline condition, they could assess the impact of the affective feedback on brain components related to motivation. Neuroimaging data showed that activation in the dopamine system was sustained following a goal reward but was sharply decreased following goal punishment. These and other findings suggest that frequent priming of a goal in temporal proximity to the activation of negative affect may dampen activity in brain systems that control the motivation and resultant operation of the goal. Accordingly, if the ability to process changes in the incentive valence is “hardwired” in the brain, then it may also play a fundamental role in automatically moderating the desire and operation of a preexisting goal that is coactivated with negative affect.

Other evidence comes from research on evaluative conditioning (De Houwer et al. 2001; Krosnick, Betz, Jussim, & Lynn, 1992). For example, in the realm of consumer behavior, Baeyens, Vansteenwegen, De Houwer, and Crombez (1996) have established that young children who repeatedly observed a model displaying a negative facial expression upon consuming a specific drink reported less liking toward the goal object than participants who saw the consumer's goal pursuits under normal conditions. This direct change in experienced liking as a result of temporal coactivation

seemed to occur without awareness of the contingency between the object and affect evoked by the facial stimulus, and this effect has been replicated with all sorts of objects and affective stimuli under very short object–stimuli exposure times (De Houwer, Baeyens, & Field, 2005; Dijksterhuis, Aarts, & Smith, 2005). It is important to note, however, that in this research, goal accessibility is not an issue: All participants are exposed to the goal object, and hence, goal priming is not manipulated. In addition, in most studies, it is unclear whether the goal object at issue represents a desired state and preexists in participants' mind (in fact, most studies use neutrally valenced goal objects). Thus, although this research points to the possibility that goals decrease in desire when goal representations are directly followed by negative stimuli, it does not demonstrate changes in motivation and operation of goal systems as a function of goal priming per se.

### The Present Research

We report five studies designed to test the hypothesis that coactivation of a preexisting goal and negative affect undermines the motivation and operation of the goal without the person's conscious awareness of the coactivation. For this purpose, we used a modified evaluative conditioning paradigm that allowed us to repeatedly pair a subliminally presented goal concept with negative affective stimuli. Subliminal presentation was used for two important reasons. First, this procedure rules out the possibility of demand characteristics because participants are unaware of the presented goal during the procedure. Second, changes in measures of goal pursuits found as a result of this procedure would provide evidence for nonconscious cessation of goal pursuits, as participants are unaware of the coactivation of the goal and negative affect. In addition, we took care to select a goal that preexists as a desired state in our research participants' minds, and thus can be rendered accessible by subliminal priming. Previous work revealed that the goal of socializing/going out meets this criterion (Sheeran et al., 2005). Thus, our procedure maximizes the probability of priming a preexisting goal and enables us to study whether this goal priming in temporal proximity to the activation of negative affect ceases goal pursuit automatically.

In our research program, we exposed all participants to the same negative affective stimuli and used the strategy to test goal priming effects by comparing a no-prime (baseline) group with a goal prime group and to test the cessation of the goal by comparing the two groups with a goal prime group for which the goal was directly paired with negative affect. Furthermore, we followed a multiple parameter approach involving effect measures that typify motivational qualities of goal systems (e.g., Aarts et al., 2004; Atkinson & Birch, 1970; Bargh et al., 2001; Brehm & Self, 1989; Shah, Friedman, & Kruglanski, 2002). Specifically, we examined effects on (a) sustained mental accessibility of the socializing goal (see Study 1) and subsequent inhibition of this goal as a result of interfering with another goal that is rendered more focal (i.e., the goal of studying; see Study 2); (b) actual behavioral effort to work for the goal (see Studies 3–4); and (c) the experienced desire of the goal itself (see Study 5).

<sup>2</sup> Under some circumstances, negative affect (such as represented by specific emotions) may also motivate behavior. We return to this issue in the General Discussion section.

## Study 1

In Study 1, we tested the hypothesis that the goal representation remains accessible when the primed goal operates as a desired state and that this operational feature of goals disappears quickly when coactivation with negative affect reduces the motivation to pursue the goal.

Several studies of the accessibility of goals provide clues as to the mental status of goal-related material in the case of a person who is no longer motivated to pursue goals (J. R. Anderson, 1983; Goschke & Kuhl, 1993; Marsh, Hicks, & Bink, 1998; Maylor, Darby, & Della Sala, 2000). First, it is demonstrated that the instigation of a desired goal causes persistent activation of the goal representation in memory—in comparison to the mere activation of semantic knowledge, which shows a rapid decay of activation over very short periods of time, usually within a couple of seconds (Forster, Booker, Schacter, & Davis, 1990; Higgins, Bargh, & Lombardi, 1985; Mckone, 1995; Wyer & Srull, 1986). However, when a person becomes less motivated to pursue the goal (e.g., socializing), that goal concept should, in principle, behave as any other semantic (nonmotivational) concept. From a functional point of view, such an observation makes perfect sense: When a goal no longer represents a state one desires to attain, one does not need to keep that particular goal at a heightened level of accessibility in order to increase the probability of acting on it when encountering goal-relevant opportunities (e.g., asking a friend to meet up later in the bar). Thus, if the coactivation of a goal and negative affect indeed reduces the motivation and resultant operation of the goal, then the accessibility of the goal should wear off rapidly to baseline level.

In a modification of the evaluative conditioning paradigm, participants were given a dot-detection task that required them to focus on the computer screen while neutral and negative words appeared on the screen (Custers & Aarts, 2005a). Unbeknownst to them, during this task they were presented with words related to the socializing goal or not. In this way, three goal conditions were created: (a) a no-goal-prime condition with only neutral and negative words; (2) a goal-prime neutral condition with neutral and negative words, in which neutral words directly followed the goal primes; and (3) a goal-prime-negative condition with neutral and negative words, in which the goal was directly followed by negative valenced words. Note that in all three conditions, participants were exposed to the same negative words and that the goal-negative and goal-neutral conditions only differ in terms of direct coactivation of the goal and negative affect. Accordingly, the no-goal (control) prime condition served as a baseline and thus allowed us to test goal priming effects in the goal-prime-neutral treatment and the cessation of the goal when coactivated with negative affect. After a delay, participants were given a lexical decision task to tap the accessibility of the socializing goal. Following previous work of this kind, it was assumed that the time taken to recognize the goal concept in this task would reflect relative accessibility of representations of the goal (e.g., Aarts & Dijksterhuis, 2003; Shah et al., 2002). Faster responses reflect higher accessibility.

On the basis of the functional view as to the accessibility of goals discussed earlier, we expected that the representation of the goal of socializing would only remain accessible when participants were primed and motivated to attain the goal. However, if the

coactivation of the goal and negative affect reduces the motivation of the goal, then the operation of the goal should cease, and the accessibility of the goal representation would be reduced to baseline level.

## Method

*Participants and design.* Fifty-eight Dutch undergraduates participated in the study and received either 4 Euro (about U.S. \$5) or course credits for their participation. Participants were randomly assigned to either a no-goal prime, goal-prime-neutral, or goal-prime-negative condition.

*Materials.* On the basis of previous work (Sheeran et al., 2005), five different words were used to prime the goal of socializing: *socializing*, *going out*, *partying*, *celebrate*, and *dancing* (all single words in Dutch). Furthermore, based on a pilot study, we selected five negative nouns (*pain*, *disease*, *trash*, *sorrow*, and *thief*) as well as 5 neutral nouns (*ballpoint*, *bucket*, *entrance*, *window*, *sidewalk*).

*Procedure.* On arrival at the laboratory, participants were told that they would take part in research conducted by different research teams and that they had to perform several unrelated tasks on a computer. The computer program assigned participants to conditions randomly and provided the instructions for the tasks. Participants worked in separate cubicles in which the experiment was presented on a computer with an 85-Hz CRT screen. The experiment consisted of two consecutive tasks: a goal manipulation task and a lexical decision task.

*Goal manipulation task.* Participants were told that they were participating in a task designed to examine the detection of briefly flashed dots on the computer screen. Allegedly to make the task more complex, they were told that a series of words would be presented on the screen and that they had to indicate whether a dot was presented either above or below these words. Thus, a dot could be presented or not, and when it was presented, it could occur either above or below a word. In actuality, this feature of the procedure ensured us that participants paid attention to the screen and the words during the goal manipulation task (see below). The computer determined whether and where a dot would be presented randomly. After reading the instructions, participants first practiced the task with unrelated stimuli words and then worked on 50 experimental trials.

In these 50 trials, the five negative and five neutral words were all presented five times. In the goal-prime-negative condition, the five goal words were each presented subliminally on five trials in direct combination with the five different negative words (25 trials). Furthermore, five different random letter strings were each presented in combination with the five different neutral words (25 trials). In the goal-prime-neutral condition, the socializing words were paired with neutral words (25 trials), and the random letter strings were paired with negative words (25 trials). Finally, to test the effect of goal priming, we included the no-goal-prime condition, in which random letter strings were linked to both negative (25 trials) and neutral words (25 trials). In each condition, then, participants were exposed to neutral and negative words. In one condition, the goal state was not primed; in another condition, the goal was primed and not directly coactivated with negative affect; and in a third condition, the goal was also primed but directly coactivated with negative affect. The order of presentation of the 50 trials was randomized.

Each trial consisted of the following events: First, a cross was presented on the screen for 500 ms, signaling the beginning of the trial. Next, a row of Xs appeared on the screen for 500 ms, immediately followed by the subliminal prime word—either a goal word or a random letter string (e.g., GBLPNSKR)—that was displayed for 23 ms (two cycles on a 85-Hz screen). After that, again a row of Xs appeared for 200 ms (postmask), followed by the supraliminal word—either a neutral or a negative word—that was presented for 150 ms. Next, 23 ms after this word had disappeared, a dot was or was not presented for 23 ms (the dot was not postmasked, and therefore it was easily visible). Finally, participants were asked whether they had seen a dot or not (by pressing a *yes* or *no* key), and 1,000 ms later, a new trial began.

**Lexical decision task.** After the goal manipulation task, there was a delay of 60 s. Next, participants received instructions for the lexical decision task in which they had to respond to 50 words. Twenty-five of the words were existing words, and 25 were nonsense words. For every word appearing on the screen, participants were asked to decide as fast and as accurately as possible whether the word was an existing word or not. Participants pressed keys on the PC's keyboard, marked *yes* or *no*. All words appeared at the same location on the screen, preceded by a fixation point (a row of Xs), for 500 ms. Response latencies were measured in milliseconds from the onset of the words to the time participants pressed a key. The time interval between word trials was 1.5 s. Five of the existing words were the goal words used in the goal manipulation task. The other 20 existing words were not related to the goal of socializing, and thus served as filler control words to test the specificity of the goal manipulation effects. The goal and control words were matched on word length. All words were presented in random order and were preceded by two practice trials. To circumvent that goal words were presented too close after each other, we fixed the position of these words on the 10th, 20th, 30th, 40th, and 50th trial. Circa 2.5 min (including instructions) had passed, then, before participants responded to the first goal word.

**Debriefing.** After the lexical decision task, participants were debriefed and checked for awareness of the goal words presented in the goal manipulation (dot-detection) task. As in our previous work, using this subliminal presentation procedure (Custers & Aarts, 2005b), none of the participants had seen the goal words. Furthermore, none of them indicated that the (negative and neutral) words presented on the screen during the dot-detection task had influenced their responses on the lexical decision task. Thus, if effects on the accessibility of the goal occur as a function of the different goal conditions, then they seem to be occur outside of participants' conscious awareness (Bargh & Chartrand, 2000).

## Results

As a reminder, we predicted that the accessibility of the goal after a delay would be reduced to baseline (no-goal condition) when the goal and negative affect are coactivated. The goal will only be kept at a heightened level of accessibility when the goal is primed and not directly followed by negative affect. To test this, the average response latency on the goal words and the control words were subjected to a 3 (goal: no, neutral vs. negative) between-participants  $\times$  2 (type of word: goal vs. control) within-participants analysis of variance (ANOVA). Incorrect (no) responses across these words were excluded from the analyses (5%

of the responses; no differences between conditions). To lessen the influence of outliers, response latencies lower than 300 ms and higher than 1,200 ms were also excluded (less than 1% out of all responses; no differences between conditions). The analysis yielded a main effect of goal that approached significance,  $F(2, 55) = 2.05, p = .14, \eta^2 = .07$ . More important, the Goal  $\times$  Type of Word interaction effect was significant,  $F(2, 55) = 3.98, p = .02, \eta^2 = .13$ . The main effect of type of word was not significant ( $F < 1$ ). Figure 1 presents the means of each cell in the design.

To gain further insight into the two-way interaction effect and to test our specific hypothesis, we conducted planned contrast tests to analyze the predicted effect of goal (no goal = negative goal > neutral goal) on the latencies for each type of word. These tests revealed that responses to the goal words were faster in the neutral goal condition than in the no-goal and negative-goal conditions,  $F(1, 56) = 7.21, p = .01$ , whereas this effect of goal on the filler control words was unreliable ( $F < 1$ ).

## Discussion

The results of Study 1 supported our prediction. Priming the goal of socializing led to sustained mental accessibility of the goal. However, when the goal coactivated with negative affect, the accessibility of the goal representation dropped to baseline (no-goal-prime condition). Note that the negative goal treatment did not cause participants to inhibit (lower than baseline) the goal. This suggests that the coactivation of the goal and negative affect ceased the operation of the goal and therefore mimicked the no-prime condition in which the goal was not put in operation. These findings are consistent with a functional account of goals, claiming that goal representations are kept at a heightened level of activation to support goal pursuit only if that goal is desired or forms a current incentive but that this activation declines rapidly when the motivation to pursue the goal is gone (e.g., J. R. Anderson, 1983; Atkinson & Birsch, 1970; see also Curtis & D'Esposito, 2003, for a possible neuroscientific account for this process).

## Study 2

Study 2 was designed to further investigate and extend the evidence of sustained accessibility on goal priming and the decline of this motivational aspect of goals in the case of reducing the desire of the goal. For this purpose, we followed the work on the

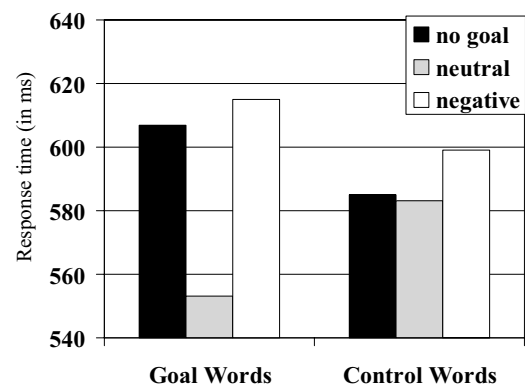


Figure 1. Response latencies as a function of goal treatment and type of word in Study 1.

role of mental accessibility as a source of interference during goal-relevant information processing. Several studies suggest that goal information that is accessible and interferes with the selection of, and attention to, current goals is inhibited to effectively guide goal pursuits (Danner, Aarts, Bender, & De Vries, 2006; Mayr, 2002; Shah et al., 2002). For instance, Mayr (2002) examined the inhibition of action rules in a task-switch paradigm as a function of accessibility. He showed that task switches resulted in the inhibition of action rules of the previous task when these rules were recently used (i.e., when these rules were still accessible) but not when the action rules were engaged in less recently (i.e., when these rules were not accessible). Thus, the rationale here is that a previously used task rule is inhibited if it causes interference (i.e., is accessible) when switching to another task rule. If the previous task rule does not interfere (i.e., is not accessible), then there is no need to inhibit it.

Shah and colleagues (2002) tested the role of inhibition as part of their goal system model. They asked participants to nominate goals they wanted to attain (e.g., studying, going out), thereby enhancing the accessibility of the competing goals under investigation. Next, they performed a lexical decision task, requiring participants to indicate whether a target represented a word or not. Among these targets were one of the listed goals (e.g., going out), and this goal was preceded by short flashes of the other goal (e.g., studying) they listed before. Shah et al. reasoned that if the study goal is rendered more focal by the short flashes, and the goal of going out is accessible and thus interferes with studying in the goal system, then the goal of going out should be inhibited (i.e., lower accessibility than baseline). This is exactly what the authors observed. These findings suggest that a goal (e.g., socializing) that is accessible and competes for attention with another temporary, more focal goal (e.g., studying) is inhibited to prevent interference during goal pursuit. In line with these findings, we hypothesized that when the goal of socializing is accessible (as a result of priming), this goal interferes with the subsequent instigation of the goal of studying. As a consequence, the socializing goal is inhibited.

More important, the data of Study 1 showed that the coactivation of the socializing goal and negative affect reduced the accessibility of the goal. This means that under these conditions, the socializing goal is less likely to interfere with the goal of studying, and according to the functional view on inhibition, the socializing goal does not need to be inhibited upon the activation of the study goal. To test this idea, in Study 2, participants performed the lexical decision task in which they were subliminally exposed to the word *studying* just before they responded to socializing goal words. In line with Shah et al. (2002), we assumed that exposure to this word renders the study goal more focal, which, in turn, inhibits the socializing goal of going out, but only if that goal is accessible (and interferes) at the moment of activating the study goal. Specifically, we expected the goal-prime-neutral condition to produce slower responses to the socializing words compared with the (baseline) no-goal-prime and the goal-prime-negative conditions (i.e., when there is no or less interference of the socializing goal because of lower accessibility).

## Method

*Participants and design.* Eighty-nine Dutch undergraduates participated in the study and received either 4 Euro (about U.S. \$5)

or course credits for their participation. Participants were randomly assigned to either a no-goal-prime, goal-prime-neutral, or goal-prime-negative condition.

*Procedure.* As in Study 1, participants first learned that they took part in research conducted by different research teams. In particular, it was told that they would participate in several unrelated tasks and that they would be asked about their study goals for the upcoming exams at the end of the experimental session. The short announcement about the study goals was implemented to enhance the probability of rendering the goal of studying more focal by subliminal exposure to the word *studying* just before measuring the accessibility of the socializing goal (see also Shah et al., 2002). After some general instructions and practice with the computer program, participants started with the experiment. First, they engaged in the dot-detection task used in Study 1 to manipulate the socializing goal. After a 1-min break, participants started working on the lexical decision task.

The lexical decision task was similar to the one used in Study 1, with one important modification. The word *studying* was briefly flashed before an existing word was presented on the screen. The word *studying* appeared for 23 ms, preceded and followed by a string of Xs for 500 ms (pre- and postmask), and then the existing word appeared on the screen. In the nonexisting-word trials, the studying primes were replaced by a string of random letters.

Finally, participants answered some general questions about their study plans and were then debriefed. As in the previous study, none of the participants reported any suspicion of the goal manipulation task or awareness that it was related to the lexical decision task. Also, they were unaware of the presentation of the goal words in the dot-detection task, nor were they aware of the studying word used as primes in the lexical decision task.

## Results

The average response latency on the socializing goal words and the control words were subjected to a 3 (goal: no, neutral vs. negative) between-participants  $\times$  2 (type of word: goal vs. control) within-participants ANOVA. Incorrect (no) responses across these words were excluded from the analyses (4% of the responses; no difference between conditions). In order to lessen the influence of outliers, response latencies lower than 300 ms and higher than 1,200 ms were also excluded (less than 2% of the responses; no difference between conditions). The analysis yielded a main effect for goal that approached significance,  $F(2, 86) = 2.85, p = .06, \eta^2 = .06$ . More important, the Goal  $\times$  Type of Word interaction effect was significant,  $F(2, 86) = 3.62, p = .03, \eta^2 = .08$ . The main effect of type of word was not significant ( $F < 1.80, \eta^2 = .02$ ). Figure 2 presents the means of each cell in the design.

To gain further insight into the two-way interaction effect and to test our specific prediction, we conducted planned contrast tests to analyze the effect of goal (no goal = negative goal < neutral goal) on the latencies for each type of word. These tests revealed that responses to the goal words were slower in the neutral-goal condition than in the no-goal and negative-goal conditions,  $F(1, 87) = 8.82, p = .004$ , whereas this effect of goal on the filler control words was unreliable ( $F < 1.61, ns$ ).

## Discussion

The pattern of results indicates that the instigation of the goal of studying led to the inhibition of the goal of socializing when that goal

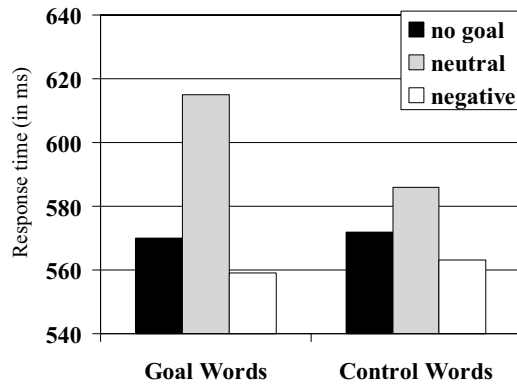


Figure 2. Response latencies as a function of goal treatment and type of word in Study 2.

was accessible as a result of previous priming (Shah et al., 2002). Like in the no-goal-prime condition, however, coactivation of the socializing goal and negative affect did not lead to inhibition of the goal. These findings extend those of Study 1 by showing that participants' goal of going out did not remain accessible when the goal coactivated with negative affect, and therefore did not interfere. Moreover, these results advance researchers' understanding of the regulation of non-conscious goal pursuit: The observation that the goal of going out was not inhibited upon the instigation of the goal of studying suggests that the mere coactivation of a competing goal with negative affect facilitates the pursuit of a focal goal without the need to beat the interference that would otherwise ensue from enhanced (sustained) accessibility of the competing goal.

### Study 3

The predicted effects of Studies 1 and 2 were based on a functional perspective on the role of goals in motivating mental processes supporting effective goal pursuit. Thus, the differences between the goal-prime-neutral and goal-negative conditions reflected non-conscious effects on goal operation arising from reduced desire of the socializing goal. In Study 3, we further explored this idea by examining the use of opportunities to attain the goal on a behavioral level. Specifically, we aimed to test whether participants who are primed with the socializing goal exhibit enhanced behavioral effort to increase the probability of goal attainment, but not when their goal and negative affect are coactivated.

The conditioning procedure of the previous studies was used to prime the goal of socializing in temporal proximity to the activation of negative affect. Participants then engaged in a filler "mouse-click task" and were told that they would participate in a lottery task thereafter in which they could win tickets for a student party, but only if there was still enough time left. It is known that effort-enhancing effects of goals become manifest when a person has to deal with time constraints that require an acceleration of performance to reach the goal (Latham & Locke, 1975; Payne, Bettman, & Luce, 1996). In the present experiment, we made use of this rationale: Participants for whom the socializing goal is primed are more likely to treat the lottery as an opportunity to attain the goal and to spend less time on the mouse-click (filler) task because that would enable them to engage in the goal-relevant task (see also Aarts, Chartrand et al., 2005). However, according to

our reasoning about nonconscious cessation of goals, these goal priming effects are expected to vanish when the goal and negative affect are coactivated—that is, when the motivation of the goal decreases and thus ceases the operation of the goal.

Study 3 served one further purpose. Specifically, we included mediator variables to explore alternative accounts for the observed goal cessation effects. For instance, although all participants are exposed to the same negative words, priming a goal in temporal proximity to the activation of negative affect may modify their mood and/or arousal, which, in turn, may influence their performance (Bargh & Cohen, 1978; Berlyne, 1960; Clore, Schwarz, & Conway, 1994; Isen, 1999; Neiss, 1988). Such changes in subjective experienced mood and/or arousal may arise, for example, when one recognizes that the personal desire to pursue the goal is reduced and one does not know the cause of this effect (i.e., the coactivation with negative affective words). Effects on the speed of the mouse-click task may thus be attributable to variances in these subjective variables. Hence, for the present purpose, two potential variables seemed relevant to test for mediator effects: mood and arousal.

### Method

**Participants.** Seventy-five Dutch undergraduates were randomly assigned to one of three goal conditions and received either 4 Euro (about U.S. \$5) or course credits for their participation.

**Procedure.** After some general instructions and practice with the computer program, participants started with the experiment that consisted of three consecutive tasks: the goal manipulation task, a mouse-click (filler) task, and a lottery task. After the goal manipulation task, participants learned that the experiment was almost completed and would be followed by one more task. Participants were also told that at the end of the session, they would have the opportunity to participate in a lottery, in which they could win tickets for a student party in the city center. It was further explained, however, that this task would be given only if sufficient time was left. All participants then completed the second required portion of the experiment, a set of 10 simple mouse-click tasks in which they had to click on tiles according to a specified pattern. They did not know in advance how long the mouse-click task would take. Our main dependent variable was the effort expended to reach the goal-related task. This measure was operationalized as participants' speed on the mouse-click task.

Immediately after the mouse-click task, a modified version of the Affect-Arousal Scale (Salovey & Birnbaum, 1989) was administered. The questionnaire contained six items differentiating feelings of mood and arousal on 9-point scales. The mood items were bad–good, sad–happy, and displeased–pleased. The arousal items were calm–excited, tired–energetic, and sedate–aroused. Participants responded to each item in terms of how they felt at that moment. Next, participants took part in a lottery.

Finally, participants were thoroughly debriefed. The debriefing showed that participants had not seen the goal words. In addition, none of them indicated that the dot-detection task had influenced their performance on the mouse-click task.

### Results

**Effort of goal pursuit.** Our main dependent variable was the time it took participants to complete the mouse-click task. The

ANOVA showed that the effect of goal was significant,  $F(2, 72) = 4.41$ ,  $p = .02$ ,  $\eta^2 = .11$ . To test our specific hypothesis, we conducted a planned contrast test to analyze the predicted effect of goal (no goal = negative goal > neutral goal) on the speed of working on the mouse-click task. This test revealed that participants worked faster in the neutral-goal condition than in the no-goal and negative-goal conditions,  $F(1, 73) = 8.72$ ,  $p = .004$ . Figure 3 shows the mean speed for each condition.

*Controlling for mood and arousal effects.* With the assessment of the mood and arousal scales, we wanted to test for potential mediators. We first conducted a multivariate analysis of variance, using goal condition (goal: no, neutral vs. negative) as the independent variable and the average of the three mood items ( $\alpha = .74$ ) and the average of the three arousal items ( $\alpha = .72$ ) as the dependent variable. Next, we performed analyses of covariance (ANCOVAs) on the effort measure, with the mood and arousal measures as covariates.

ANOVAs revealed no significant main effect on the two dependent variables ( $F_s < 1.07$ ), indicating that reports on mood and arousal were unaffected by the different goal treatments. ANCOVAs yielded the same pattern of significant results for goal after controlling for mood,  $F(2, 71) = 4.69$ ,  $p = .01$ , and after controlling for arousal,  $F(2, 71) = 4.33$ ,  $p = .02$ . Taken together, these analyses indicate that the observed pattern of results is attributable neither to changes in mood nor to variations in arousal.

### Discussion

The results of Study 3 extend the previous findings by showing that priming of the goal to socialize increased the likelihood of using a goal-related opportunity by exerting behavioral effort but that these effects vanished when the goal and negative affect coactivated. More important, the pattern of results indicates that the behavior in the goal-prime-negative condition was equal to the no-goal-prime (baseline) condition. This suggests that, consistent with the findings of Studies 1 and 2, the goal-prime-negative treatment ceased the operation of the goal as a result of the reduction of the desire of the goal (we return to this point in Study 5). Furthermore, the subliminal presentation of the goal did not allow participants to become aware of the source of these effects, and the goal treatment did not change participants' mood and arousal. These findings further support the hypothesis that coactivation of a goal and negative affect is capable of diminishing the

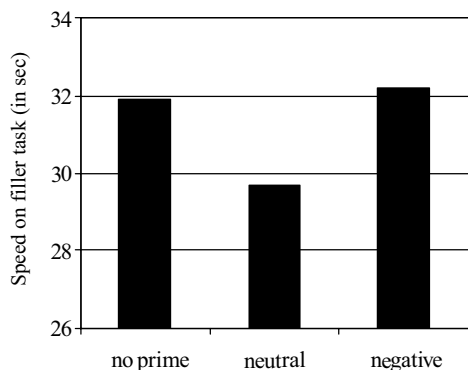


Figure 3. Speed on filler task as a function of goal treatment in Study 3.

motivation and operation of that goal without participants' awareness of the process causing these effects.

It should be noted that the goal-prime-negative condition in the previous three studies used a coactivation procedure in which participants were primed with the socializing goal for 23 ms, which was followed 200 ms later by the negative words. Given this short time interval between the goal prime and the presentation of negative words, it may be argued that the goal representation was not primed at all because of the attention-grabbing function of the negative words that has been reported in the literature (Pratto & John, 1991; Wentura, Rothermund, & Bak, 2000; Williams, Matthews, & MacLeod, 1996; but see, A. K. Anderson, 2005; Harris & Pashler, 2004). That is, the negative words may have impaired the processing of the goal primes, which provides an alternative explanation for the finding that the effects of the goal-prime-negative condition were similar to the no-goal-prime condition.

To investigate this attention account, we designed a fourth study in which we made sure that the goal primes were processed in the negative condition. Specifically, we included (besides the trials in which the goal was primed and immediately followed by negative words) trials in which the goal was primed followed by neutral words. According to the attention account, in this condition one would predict an increase in opportunity-seeking behavior similar to that in the goal-prime-neutral condition because although the primes would not be processed when followed with negative words, they would be when followed by neutral words that do not have attention-grabbing power (see Study 3). However, if the negative affect that coactivated with the goal actually ceases goal pursuit, one would expect no effect on behavior compared with the no-goal condition, even though the goal was additionally primed on trials with neutral words.

### Study 4

#### Method

*Participants.* Sixty-three Dutch undergraduates were randomly assigned to one of the three goal conditions and received either 4 Euro (about U.S. \$5) or course credits for their participation.

*Procedure.* The procedure and instructions were identical to those used in Study 3, with one exception. In the goal-prime-negative condition, we now primed the goal of socializing in all 50 trials, half of them followed by neutral words (thus equaling the goal-prime-neutral condition) and half of them followed by the negative words. Thus, in this condition, participants were primed with the goal of socializing, and half of the time, these primes were directly coactivated with negative affect. After the goal manipulation task, the experiment proceeded with the mouse-click task and the lottery. Our main dependent variable was again participants' speed on the mouse-click task.

As in the previous studies, the debriefing showed that participants were unaware of the presentation of the goal state words. In addition, none of them indicated that the dot-detection task had influenced their performance on the mouse-click task.

#### Results and Discussion

Participants' time to complete the mouse-click task was subjected to the ANOVA. This analysis yielded a significant effect,



$F(2, 60) = 4.34, p < .02, \eta^2 = .13$ . To test our specific hypothesis, we conducted a planned contrast test to analyze the predicted effect of goal (no goal = negative goal > neutral goal) on the speed of working on the mouse-click task. This test revealed that participants worked faster in the neutral-goal condition than in the no-goal and negative-goal conditions,  $F(1, 61) = 8.47, p = .005$ . Figure 4 shows the mean speed for each condition.

The results of Study 4 replicate and extend the previous findings of Study 3 by ruling out the possibility that the direct coactivation of the goal and negative words impaired the processing of the goal primes, as the goal was primed in the goal-prime-negative condition as well (just like in the goal-prime-neutral condition). These findings thus further support our contention that it is the direct coactivation of a goal and negative affect that ceases goal pursuit without participants' awareness of the process causing these effects.

### Study 5

So far, four studies corroborated the idea that priming a goal in concert with negative affect reduces the desire (or wanting) of the goal, thereby ceasing the operation of the goal. Although we proposed that this motivation reduction effect does not require conscious intervention, we do not claim that people cannot experience the reduction in goal desire. This experienced desire may be manifested if, all else being equal, the representation of the goal gains access to consciousness. Such access is gated by attention and occurs when people are directly asked to indicate their desire of the goal (Aarts et al., 2004; Baars, 1998; Wegner & Smart, 1997). In that case, people will consult and rely on the current status of the given goal system, and if this system resonates or emits lower levels of motivational value because of the previous coactivation with negative affect, then they are likely to experience less desire of that goal in comparison to the no-goal prime (control) and goal-prime-neutral conditions. In these conditions, individuals experience higher (and equal) levels of wanting regardless of priming because the goal preexists as a desired state and can be expressed in the explicit wanting assessment that renders the given goal consciously accessible (see also Aarts et al., 2004). Accordingly, goal priming is expected to reduce the desire of the goal if the goal is primed in temporal proximity to the activation of negative affect, which Study 5 was designed to test.

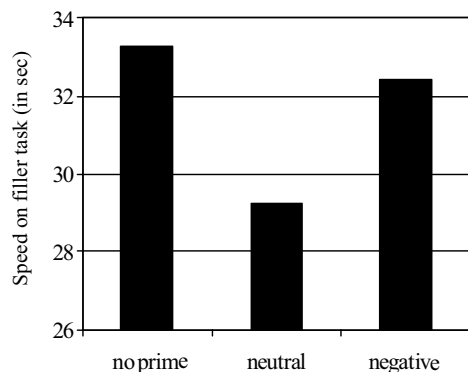


Figure 4. Speed on filler task as a function of goal treatment in Study 4.

Study 5 served another purpose. In the previous studies, we used negatively valenced words that referred to specific objects (e.g., *thief, trash*). It may be argued that exposure to these words evoked the desire to pursue object-specific actions (e.g., chasing the thief, putting the trash outside). The finding that the goal-negative treatment ceased the operation of the goal thus could be explained by a shift in desirability or motivation from the socializing goal to these object-specific action goals (cf. Fishbach, Shah, & Kruglanski, 2004). Although such a goal-shift process may be part of the prioritization of goals, the goal cessation hypothesis put forth here posits that it is the coactivation of negative affect per se that reduces the desire of the nonconsciously activated goal. More compelling evidence for this idea would be offered by demonstrating that the reduced desire also shows up when the socializing goal is attached to words that have intrinsic negative valence but do not refer to specific objects. Therefore, Study 5 compared the specific words with more general evaluative words (e.g., *bad, wrong*) that are less likely to be perceived in terms of specific actions.

### Method

**Participants.** Two hundred seven Dutch undergraduates were randomly assigned to one of the cells of the 3 (goal: no, neutral vs. negative)  $\times$  2 (type of affective words: specific vs. general) between-participants design. They received either 4 Euro (about U.S. \$5) or course credits for their participation.

**Procedure.** After some general instructions and practice with the computer program, participants started with the experiment. The experiment consisted of two consecutive tasks: the goal manipulation task and a task measuring the level of goal desire. In the specific-word condition, the goal manipulation task was identical to that of the previous studies. In the general-word condition, the specific words were replaced by the following general negative words: *bad, wrong, unpleasant, dull, nasty*. Immediately after the goal manipulation task, participants were confronted with an inventory of behavioral goals, aimed to assess how the desire or wanting for these goals may change over time and differ among students. Therefore, participants were asked to indicate as quickly as possible how much they want to accomplish several behavioral goals. Speeded responses were used because time pressure has been found to enhance the relation between implicit processes and explicit judgments (e.g., Wilson, Lindsey, & Schooler, 2000). Responses could be given on a 11-point response scale, ranging from 1 (*not at all*) to 11 (*a lot*). They did not know in advance what and how many goals they had to respond to. As the critical goal question, participants were asked to report their desire as to the socializing goal of going out. In addition, they also indicated their desire as to the goal of exercising and going shopping (two goals that, in effect, are unrelated to the goal of socializing and going out). Responses to these last two desire questions were averaged and served as controls, which allowed us to test the specificity of the reduced desire effect. The three questions were randomly presented. Finally, participants were debriefed. The debriefing showed that participants had not seen the goal words. In addition, none of them indicated that the dot-detection task had influenced their responses on the wanting questions.

*Results and Discussion*

The goal ratings were subjected to a 3 (goal: no, neutral vs. negative) × 2 (type of affective words: specific vs. general) between-participants × 2 (type of goal rating: socializing vs. unrelated) within-participants ANOVA. The analysis yielded a main effect of goal,  $F(2, 201) = 8.10, p = .001, \eta^2 = .08$ , and a main effect of type of goal rating,  $F(1, 201) = 10.48, p = .003, \eta^2 = .05$ . These main effects, however, were qualified by the Goal × Type of Goal Rating interaction effect,  $F(2, 201) = 5.79, p = .004, \eta^2 = .05$ . Of most importance, this interaction effect was not qualified by type of affective words ( $F < 1$ ). Figure 5 presents the Goal × Type of Goal interaction effect, with the means for the two affective word conditions separately.

To gain further insight into the two-way interaction effect and to test our specific prediction, we conducted planned contrast tests to analyze the effect of goal (no goal = neutral goal > negative goal) on each type of goal rating. These tests revealed that the desire of the socializing goal was lower in the negative-goal condition than in the no- and neutral-goal conditions,  $F(1, 205) = 24.53, p < .001$ , whereas this effect of goal on the unrelated goals was unreliable ( $F < 1.61, ns$ ). In addition, testing this planned contrast effect for the specific and general affective words conditions separately showed that the desire of the socializing goal was lower in the negative-goal condition than in the no- and neutral-goal conditions,  $F(1, 204) = 9.73, p = .002$  and,  $F(1, 204) = 15.19, p < .001$ , respectively. In other words, the specific as well as the general negative affective words reduced the desire of the socializing goal.

In summary, these results confirm our hypothesis that if a goal coactivates with negative affect, then this will lead to a reduction in the desire of this specific goal. This reduced desire occurs irrespective of the type of negative affective words that were used. The observation that object-specific (e.g., *thief, trash*) and general words (e.g., *bad, wrong*) both reduced the desire of the socializing goal makes it less likely that the cessation of goal pursuit observed

in Studies 1–4 emerged merely because the goal-negative treatment evoked object-specific actions that shifted the desirability from the socializing goal to these action goals.

Of importance, our findings showed that the goal turned out to be experienced as equally (and relatively highly) desired in the goal-prime-neutral and no-goal-prime (control) condition. This indicates that priming did not cause people to experience more desire of the goal when assessed by the explicit goal desire question. The equal desire of the goal in the no-goal prime and goal-prime-neutral conditions shows that the goal preexisted as a desired state in participants' minds, which they readily relied on to arrive at the experience of goal desire. This line of reasoning is supported by other recent research (Aarts et al., 2004; Bargh et al., 2001; Custers & Aarts, 2005b) and suggests that priming the representation of a goal solely enhanced the operation and, as a consequence, the probability of pursuing the goal. As the results of Studies 1–4 indicate, the no-goal prime (control) and goal-prime-neutral conditions therefore differed on sustained accessibility and opportunity-seeking behavior.

General Discussion

We examined how priming of a preexisting desired goal produces motivational activity in cognition and behavior and how this activity is modulated if the goal is primed in temporal proximity to the activation of negative affect. Specifically, across five studies we replicated and extended past research on nonconscious goal pursuit by observing that subliminal priming of a goal enhanced motivational activity directed toward the goal, as was established by sustained accessibility of the goal, inhibition of the goal as a result of competing with a more focal goal, and increased effort to use goal-related opportunities. However, the desire of the goal decreased and the effect of goal priming vanished when the goal was primed in temporal proximity to the activation of negative affect. Taken together, the present research provides new and

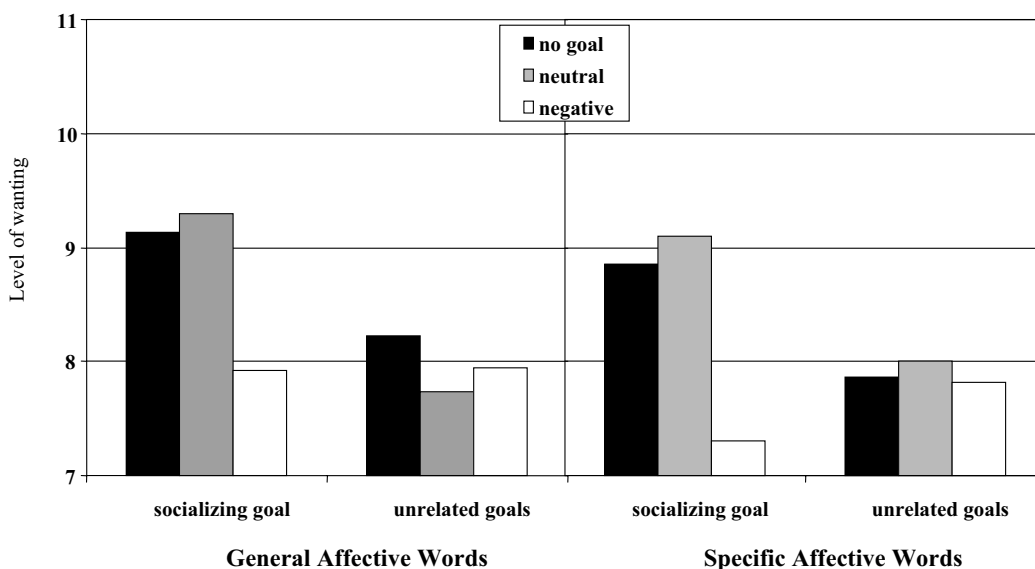


Figure 5. Level of wanting as a function of goal treatment, type of affective word, and type of goal in Study 5.

important findings showing that the motivation and subsequent operation of social goals may cease when these goals are linked to negative affect by mere coactivation.

In general, our findings concur with contemporary perspectives that consider negative affect (or feelings) accompanying a goal object as a crucial step in the process of ceasing the operation of the goal (e.g., Bandura, 1986; Carver & Scheier, 1998; Klinger, 1975; Martin & Tesser, 1996). In most of this research, the cessation of personal goals are studied as a result of (recurrent) negative affective experiences accompanying explicit goal setting and reflection, which may emphasize that goal pursuits are ceased by an act of conscious will. However, the idea that negative affect may demotivate and cease nonconsciously triggered goal pursuits directly has hitherto received little theoretical analysis and empirical attention. In the present research, we examined and established support for this idea. Our research program thus extends and integrates present inquiries into nonconscious goal pursuit with modern research on evaluative conditioning and the role of implicit affective (neuropsychological) processes in guiding incentive value, decision making, and motivated human action (Berridge, 2001; Damasio, 1994; De Houwer et al., 2001; Delgado et al., 2000).

Furthermore, past research suggests that one effective way to regulate nonconscious goal pursuits involves a process of inhibition (e.g., Shah, 2005; Shah et al., 2002), in which the instigation of a focal goal automatically inhibits the representation of other accessible desired goals that compete for attention in the given goal system (see also Study 2). According to this view, the regulation of goal pursuit is based on controlling the accessibility of interfering goal representations. The present research offers another route to the regulation of nonconscious goal pursuit. Specifically, we observed that priming a goal in concert with negative affect reduces the desire or motivation of the goal and thus people cease to pursue the given goal further. These findings thus extend our understanding of the regulation of nonconscious goals by illustrating that the direct modulation of the desirability of goals could be another effective way to guide the goal system in the situation at hand.

### *The Role of Accessibility and Desirability in Priming Goal Pursuits*

Most contemporary research into nonconscious goal pursuit capitalizes on the idea that goal pursuit can be primed by exposure to concepts related to the goal. In so doing, research on goal priming may be characterized as an exploratory adventure (“Let’s present people with achievement, cooperation, power, food, or computers and see what happens”) in which principles of conscious motivation and goal pursuit are considered to explore the conditions that render the primed concept more or less likely to operate as a goal (“Participants should keep their goal alive, enhance their effort, and experience interference with other goals”). Though we believe that such an enterprise is important to advance the idea of nonconscious goal pursuit, a more detailed understanding of the underlying mechanisms may help to generate specific predictions about the nature of goal priming effects and to better distinguish these effects from other recent accounts of automatic behavior, such as the perception–behavior link view (Bargh, 1997; Dijksterhuis & Bargh, 2001). The present research analyzed the changes in the affective-motivational context surrounding goal priming to explore new ways to arrive at such an understanding. Our present as well as other recent findings

(Aarts, Chartrand et al., 2005; Custers & Aarts, 2005b, in press) may give rise to considering the role of implicit affect in the emergence of nonconscious goal pursuit. We briefly discuss what we have discovered below.

As argued above, goal priming studies usually start with the idea that enhancing the accessibility of the representation of a goal concept (in which a goal refers to a behavioral state or outcome) causes people to strive for and pursue the goal. However, whether the primed concept is perceived as a goal depends on the person who is primed. That is, concept priming leads to motivational activity in cognition and behavior only if the concept represents a desired state in the perceiver’s mind. If not, concept priming resembles mere knowledge priming and may lead to behavioral changes, according to the perception–behavior link account, in a passive and reflexive way. In a recent research program, Custers and Aarts (2005b, in press) addressed this point and showed that a primed behavior representation behaves as a behavioral goal or desired state only if the representation is attached to positive affect. Enhancing the mental accessibility of such a goal representation—either consciously or nonconsciously—is capable of directly motivating goal-directed activity (cf. Shizgal, 1999).

As an important addition, the present data show that the operation of goals ceases when they are coactivated with negatively valenced information. Furthermore, the data revealed that this negative-goal treatment rendered the goal less desired, that is, participants indicated to be less motivated to pursue the primed goal. In the analysis elaborated here, which borrows from proposals by others examining affective processes in human behavior (Cacioppo & Berntson, 1999; Gray, 1987; Lang, 1995; Watson & Clark, 1992), affect is treated as two separate dimensions—a positive and negative one—that independently contribute to the motivational value of a goal system. Specifically, positive affect attached to a primed goal actuates the motivational activity to pursue the goal, whereas negative affect coactivated with the goal dampens this motivational activity. Therefore, it may be expected that when goal concepts are neutral or do not represent desire states, the coactivation of negative affect would not tune down the motivation to attain the goals, as the motivational activity is not triggered to begin with (cf. Custers & Aarts, 2005b). In this view, then, the desire of the preexisting (positive) goal abates when the goal is primed in temporal proximity to the activation of negative affect. The initial interest in the goal dwindles if a “no-go signal,” so to speak, is delivered repeatedly in the course of motivating the goal system, causing people to stop keeping the goal mentally alive, not to exhibit behavior to attain the goal, and to experience lower levels of desire. Thus, people seem to have a natural mechanism to only adopt and strive for goal concepts that boil down to a desired state that is, when the primed concept directs and motivates goal-directed activity (Aarts et al., 2004; Bargh et al., 2001).

### *Limitations and Future Directions*

The present investigation was conducted as a first attempt to analyze the role of negative affect in nonconscious goal pursuit. Our research still has a preliminary status and thus leaves a number of questions open for further examination. First, in the present studies, we conceptualized affect as a quality or valence assigned to an entity and used goal-unrelated words that have intrinsic valence. Our findings thus bear on the role of negative valence, and the specificity of the present findings to nonconscious cessa-

tion of goal pursuit may be because of the particular affective treatment of the goals. It is possible that the affective influence on the motivation and cessation of the primed goal posited here differs from negative affect emanating from other sources, such as emotions that have functionally different qualities. There is research to suggest that distinct negative emotions (e.g., anger) can trigger general approach motivations that signal to the person that something needs to be done to improve the situation at hand. In other words, certain negative emotions may encourage rather than discourage goal pursuit (Carver, 2004; Frijda, 1986; Harmon-Jones & Allen, 1998; Simon, 1967). Of interest, in a recent study, Winkielman et al. (2005) exposed participants who were aware of being thirsty to subliminal facial expressions of such negative emotions and showed, similar to the valence effects obtained in the present studies, a decline in motivation to drink. Provided that goals can be nonconsciously activated in temporal proximity of the activation of negative affect resulting from such emotions, future research could explore whether and how the mere coactivation modifies the desire and operation of the goal.

A second issue pertains to our contention that the desire and resultant operation of a preexisting goal is modulated automatically if that goal is nonconsciously activated and directly followed by negative affect. Although we believe that the present findings support this claim, we have to concede that it is unclear whether participants were aware of the reduced desire itself and the cessation of goal pursuits. Study 5 showed that the negative-goal treatment decreased participants' experienced desirability of the goal, which suggests that they were aware of the effect of the treatment. It should be noted, though, that these effects were established as participants were explicitly asked to indicate their desire of the goal and the representation of the goal was "forced" to gain access to consciousness. Although mainly studied in isolation, there is some evidence that goal-related processes (e.g., evaluation, perception, memory use, judgment, and behavior) can be automatic and do not require conscious control (Custers & Aarts, 2005a; Ferguson & Bargh, 2004a; Moskowitz et al., 2004). Therefore, it is conceivable that the desirability and operation of goal pursuits can be dismissed without conscious awareness as well. This line of thought suggests that (the initiation and cessation of) goal pursuit is rooted in, and guided by, the unconscious, but consciousness can provide meaning and direction by reflecting on the output of these processes (e.g., Aarts, Custers, & Wegner, 2005; Baars, 1998; Wilson, 2002). Further research could shed light on this important issue by studying the conditions that render people aware of their goals and how these conditions moderate nonconscious goal pursuit.

Finally, the present research focused on cognitive and behavioral effects resulting from one particular goal, that of socializing. Furthermore, the goal of socializing preexisted as a desired state that our sample of students encounter continuously (Chulef, Read, & Walsh, 2001). It is important to note, however, that this should not be taken to mean that the desire and operation of every goal can be reduced and that individuals are forever (and ever) discouraged to pursue their goals when these goals are coactivated with negative affect. The present findings and conclusions thus do not simply generalize to all types of goals that people may have. Future research needs to find out whether the effects of goals as a result of coactivating with negative affect are moderated by basic goal features, such as the degree of initial desire and chronic accessibility of the goal, and for how long the effect may last. Our research, which tested relatively short-term effects, suggests that

negative affect attached to the goal of going out reduces the desire and operation of the goal for more than 2 min.

### Concluding Remarks

We observed that subliminal goal priming effects disappear when that goal is primed in temporal proximity to the activation of negative affect. Perhaps the most important theoretical significance of the present research lies in demonstrating that our mental apparatus is capable of not only initiating motivational activity directed at goals but also ceasing this activity on the basis of affective information processing without conscious assistance. The study on affective processes only has just begun to reach the domain of nonconscious goal pursuit and calls for further theoretical and empirical specification. We feel that the present analysis may offer some new directions in this emerging field.

### References

- Aarts, H., Chartrand, T. L., Custers, R., Danner, U., Dik, G., Jefferis, V., & Cheng, C. M. (2005). Social stereotypes and automatic goal pursuit. *Social Cognition, 23*, 464–489.
- Aarts, H., Custers, R., & Wegner, D. M. (2005). On the inference of personal authorship: Enhancing experienced agency by priming effect information. *Consciousness and Cognition, 14*, 439–458.
- Aarts, H., & Dijksterhuis, A. (2000). Habits as knowledge structures: Automaticity in goal-directed behavior. *Journal of Personality and Social Psychology, 78*, 53–63.
- Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology, 84*, 18–28.
- Aarts, H., Dijksterhuis, A., & Dik, G. (in press). Goal contagion: Inferring goals from others' actions—and what it leads to. In J. Y. Shah & W. Gardner (Eds.), *Handbook of motivation science*. New York: Guilford Press.
- Aarts, H., Gollwitzer, P. M., & Hassin, R. R. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology, 87*, 23–37.
- Anderson, A. K. (2005). Affective influences on the attentional dynamics supporting awareness. *Journal of Experimental Psychology: General, 134*, 258–281.
- Anderson, J. R. (1983). *On the architecture of cognition*. Cambridge, MA: Harvard University Press.
- Atkinson, J. W., & Birch, D. (1970). *A dynamic theory of action*. New York: Wiley.
- Baars, B. J. (1998). Metaphors of consciousness and attention in the brain. *Trends in Neurosciences, 21*, 58–62.
- Baeyens, F., Vansteenwegen, D., De Houwer, J., & Crombez, G. (1996). Observational conditioning of food in humans. *Appetite, 27*, 235–250.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bargh, J. A. (1990). Automotives: Preconscious determinants of social interaction. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 93–130). New York: Guilford Press.
- Bargh, J. A. (1997). The automaticity of everyday life. In R. S. Wyer, Jr. (Ed.), *The automaticity of everyday life: Advances in social cognition* (Vol. 10, pp. 1–61). Mahwah, NJ: Erlbaum.
- Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253–285). New York: Cambridge University Press.
- Bargh, J. A., & Cohen, J. L. (1978). Mediating factors in the arousal-performance relationship. *Motivation and Emotion, 2*, 243–257.

- Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Trötschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81*, 1014–1027.
- Bechara, A., Damasio, H., & Damasio, A. R. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral Cortex, 10*, 295–307.
- Berlyne, D. E. (1960). *Conflict, curiosity and arousal*. New York: McGraw-Hill.
- Berridge, K. C. (2001). Reward learning: Reinforcement, incentives, and expectations. In D. L. Medin (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 40, pp. 223–278). San Diego, CA: Academic Press.
- Besson, C., & Louilot, A. (1995). Asymmetrical involvement of mesolimbic dopaminergic neurons in affective perception. *Neuroscience, 68*, 963–968.
- Blackmore, S. (2003). *Consciousness: An introduction*. New York: Oxford University Press.
- Brehm, J. W., & Self, E. (1989). The intensity of motivation. *Annual Review of Psychology, 40*, 109–131.
- Cacioppo, J. T., & Berntson, G. G. (1999). The affect system: Architecture and operating characteristics. *Current Directions in Psychological Science, 8*, 133–137.
- Carver, C. S. (2004). Negative affects deriving from the behavioral approach system. *Emotion, 4*, 3–22.
- Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. New York: Springer-Verlag.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.
- Chulef, A. S., Read, S. J., & Walsh, D. A. (2001). A hierarchical taxonomy of human goals. *Motivation and Emotion, 25*, 191–232.
- Clore, G. L., Schwarz, N., & Conway, M. (1994). Affective causes and consequences of social information processing. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., Vol. 1, pp. 323–418). Hillsdale, NJ: Erlbaum.
- Curtis, C. E., & D'Esposito, M. (2003). Persistent activity in the prefrontal cortex during working memory. *Trends in Cognitive Sciences, 7*, 415–423.
- Custers, R., & Aarts, H. (2005a). Beyond priming effects: The role of affect and goal-discrepancies in implicit processes of motivation and goal-pursuit. *European Review of Social Psychology, 16*, 257–300.
- Custers, R., & Aarts, H. (2005b). Positive affect as implicit motivator: On the nonconscious operation of behavioral goals. *Journal of Personality and Social Psychology, 89*, 129–142.
- Custers, R., & Aarts, H. (in press). In search of the nonconscious sources of goal pursuit: Accessibility and positive affective valence of the goal state. *Journal of Experimental Social Psychology*.
- Damasio, A. R. (1994). *Descartes' error: Emotion, reason, and the human brain*. New York: Putnam.
- Danner, U. N., Aarts, H., Bender, M., & De Vries, N. K. (2006). *Multiple options to goal attainment: Repeated selection of target means causes inhibited access to alternatives*. Manuscript submitted for publication.
- De Houwer, J., Baeyens, F., & Field, A. P. (2005). Associative learning of likes and dislikes: Some current controversies and possible ways forward. *Cognition & Emotion, 19*, 161–174.
- De Houwer, J., Thomas, S., & Baeyens, F. (2001). Association learning of likes and dislikes: A review of 25 years of research on human evaluative conditioning. *Psychological Bulletin, 127*, 853–869.
- Delgado, M. R., Nystrom, L. E., Fissell, C., Noll, D. C., & Fiez, J. A. (2000). Tracking the hemodynamic responses to reward and punishment in the striatum. *Journal of Neurophysiology, 84*, 3072–3077.
- Dijksterhuis, A., & Aarts, H. (2003). On wildebeests and humans: The preferential detection of negative stimuli. *Psychological Science, 14*, 14–18.
- Dijksterhuis, A., Aarts, H., & Smith, P. K. (2005). The power of the subliminal: On subliminal persuasion and other potential applications. In R. Hassin, J. S. Uleman, & J. A. Bargh (Eds.), *The new unconscious* (pp. 77–106). New York: Oxford University Press.
- Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 33, pp. 1–40). New York: Academic Press.
- Fazio, R. H. (2001). On the automatic activation of associated evaluations: An overview. *Cognition & Emotion, 15*, 115–141.
- Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50*, 229–238.
- Ferguson, M. J., & Bargh, J. A. (2004a). How social perception automatically can influence behavior. *Trends in Cognitive Sciences, 8*, 33–39.
- Ferguson, M. J., & Bargh, J. A. (2004b). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology, 87*, 557–572.
- Fishbach, A., Shah, J. Y., & Kruglanski, A. W. (2004). Emotional transfer in goal systems. *Journal of Experimental Social Psychology, 40*, 723–738.
- Fitzsimons, G. M., & Bargh, J. A. (2003). Thinking of you: Nonconscious pursuit of interpersonal goals associated with relationship partners. *Journal of Personality and Social Psychology, 84*, 148–164.
- Forster, K. I., Booker, J., Schacter, D. L., & Davis, C. (1990). Masked repetition priming: Lexical activation or novel memory trace? *Bulletin of the Psychonomic Society, 28*, 341–345.
- Frijda, N. H. (1986). *The emotions*. New York: Cambridge University Press.
- Goschke, T., & Kuhl, J. (1993). Representation of intentions: Persisting activation in memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19*, 1211–1226.
- Gottfried, J. A., O'Doherty, J., & Dolan, R. J. (2002). Appetitive and aversive olfactory learning in humans studied using event-related functional magnetic resonance imaging. *Journal of Neuroscience, 22*, 10829–10837.
- Gray, J. A. (1987). *The psychology of fear and stress* (2nd ed.). New York: Cambridge University Press.
- Harmon-Jones, E., & Allen, J. J. (1998). Anger and frontal brain activity: EEG asymmetry consistent with approach motivation despite negative affective valence. *Journal of Personality and Social Psychology, 74*, 1310–1316.
- Harris, C. R., & Pashler, H. (2004). Attention and the processing of emotional words and names: Not so special after all. *Psychological Science, 15*, 171–178.
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 30, pp. 1–46). New York: Academic Press.
- Higgins, E. T., Bargh, J. A., & Lombardi, W. (1985). The nature of priming effects on categorization. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 11*, 59–69.
- Isen, A. M. (1999). Positive affect. In T. Dalgleish & M. Power (Eds.), *Handbook of cognition and emotion* (pp. 521–539). Chichester, England: Wiley.
- Isen, A. M., & Diamond, G. A. (1989). Affect and automaticity. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 124–152). New York: Guilford Press.
- Joel, D. (1999). The limbic basal-ganglia-thalamocortical circuit and goal-directed behavior. *Behavioral and Brain Sciences, 22*, 525–526.
- Klinger, E. (1975). Consequences of commitment to and disengagement from incentives. *Psychological Review, 82*, 1–25.
- Krosnick, J. A., Betz, A. L., Jussim, L. J., & Lynn, A. R. (1992). Subliminal conditioning of attitudes. *Personality and Social Psychology Bulletin, 18*, 152–162.

- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Kepler, D. (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 331–378). San Diego, CA: Academic Press.
- Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. *American Psychologist*, *50*, 372–385.
- Latham, G. P., & Locke, E. A. (1975). Increasing productivity and decreasing time limits: A field replication of Parkinson's law. *Journal of Applied Psychology*, *60*, 524–526.
- LeDoux, J. (1996). *The emotional brain*. New York: Simon & Schuster.
- Marie, R. M., & Defer, G. L. (2003). Working memory and dopamine: Clinical and experimental clues. *Current Opinion in Neurology*, *16*, S29–S35.
- Marsh, R. L., Hicks, J. L., & Bink, M. L. (1998). Activation of completed, uncompleted, and partially completed intentions. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *24*, 350–361.
- Martin, L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer (Ed.), *Advances in social cognition* (Vol. 9, pp. 1–48). Hillsdale, NJ: Erlbaum.
- Maylor, E. A., Darby, R. J., & Della Sala, S. (2000). Retrieval of performed versus to-be-performed tasks: A naturalistic study of the intention-superiority effect in normal aging and dementia. *Applied Cognitive Psychology*, *14*, S83–S98.
- Mayr, U. (2002). Inhibition in action rules. *Psychonomic Bulletin & Review*, *9*, 93–99.
- Mckone, E. (1995). Short-term implicit memory for words and nonwords. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 1108–1126.
- Moskowitz, G. B., Li, P., & Kirk, E. R. (2004). The implicit volition model: On the preconscious regulation of temporarily adopted goals. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 36, pp. 317–404). New York: Academic Press.
- Neiss, R. (1988). Reconceptualizing arousal: Psychobiological states in motor performance. *Psychological Bulletin*, *103*, 345–366.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*, 231–259.
- Nørretranders, T. (1991). *The user illusion: Cutting consciousness down to size*. New York: Penguin.
- Payne, J. W., Bettman, J. R., & Luce, M. F. (1996). When time is money: Decision behavior under opportunity-cost time pressure. *Organizational Behavior and Human Decision Processes*, *66*, 131–152.
- Peak, H. (1955). Attitude and motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 149–189). Lincoln: University of Nebraska Press.
- Pervin, L. A. (1982). The stasis and flow of behavior: Toward a theory of goals. In R. A. Dienstbier & M. Page (Eds.), *Personality: Current theory and research* (pp. 1–53). Lincoln: University of Nebraska Press.
- Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology*, *61*, 380–391.
- Robbins, T. W., & Everitt, B. J. (1996). Neurobehavioral mechanisms of reward and motivation. *Current Opinion in Neurobiology*, *6*, 228–236.
- Rotzinger, S., Bush, D. E., & Vaccarino, F. J. (2002). Cholecystokinin modulation of mesolimbic dopamine function: Regulation of motivated behavior. *Pharmacology and Toxicology*, *91*, 404–413.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, *110*, 145–172.
- Salamone, J. D., Correa, M., Mingote, S. M., & Weber, S. M. (2005). Beyond the reward hypothesis: Alternative functions of nucleus accumbens dopamine. *Current Opinion in Pharmacology*, *5*, 34–41.
- Salovey, P., & Birnbaum, D. (1989). Influence of mood on health-relevant cognitions. *Journal of Personality and Social Psychology*, *57*, 539–551.
- Schneirla, T. C. (1959). An evolutionary and developmental theory of biphasic processes underlying approach and withdrawal. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 1–43). Lincoln: University of Nebraska Press.
- Schultz, W. (1998). Predictive reward signal of dopamine neurons. *Journal of Neurophysiology*, *80*, 1–27.
- Shah, J. Y. (2005). The automatic pursuit and management of goals. *Current Directions in Psychological Science*, *14*, 10–13.
- Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedent and consequences of goal shielding. *Journal of Personality and Social Psychology*, *83*, 1261–1280.
- Sheeran, P., Aarts, H., Custers, R., Webb, T. L., Cooke, R., & Ravis, A. (2005). The goal-dependent automaticity of drinking habits. *British Journal of Social Psychology*, *44*, 47–63.
- Shizgal, P. (1999). On the neural computation of utility: Implications from studies of brain stimulation reward. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 500–524). New York: Russell Sage Foundation.
- Simon, H. A. (1967). Motivational and emotional control of cognition. *Psychological Review*, *74*, 29–39.
- Tesser, A., Martin, L. L., & Cornell, D. P. (1996). On the substitutability of self-protective mechanisms. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 48–68). New York: Guilford Press.
- Watson, D., & Clark, L. A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology*, *62*, 489–505.
- Watt, D. F. (1998). Affect and the limbic system: Some hard problems. *Journal of Neuropsychiatry*, *10*, 113–116.
- Wegner, D. M. (2002). *The illusion of conscious will*. Cambridge, MA: MIT Press.
- Wegner, D. M., & Smart, L. (1997). Deep cognitive activation: A new approach to the unconscious. *Journal of Consulting and Clinical Psychology*, *65*, 984–995.
- Wentura, D., Rothermund, K., & Bak, P. (2000). Automatic vigilance: The attention-grabbing power of approach- and avoidance-related social information. *Journal of Personality and Social Psychology*, *78*, 1024–1037.
- Wightman, R. M., & Robinson, D. L. (2002). Transient changes in mesolimbic dopamine and their association with “reward”. *Journal of Neurochemistry*, *82*, 721–735.
- Williams, J. M. G., Matthews, A., & MacLeod, C. (1996). The emotional Stroop task and psychopathology. *Psychological Bulletin*, *120*, 3–24.
- Wilson, T. D. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Belknap Press.
- Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review*, *107*, 101–126.
- Winkielman, P., Berridge, K. C., & Wilbarger, J. (2005). Unconscious affective reactions to masked happy versus angry faces influence consumption behavior and judgments of value. *Personality and Social Psychology Bulletin*, *31*, 121–135.
- Wyer, R. S., & Srull, T. K. (1986). Human cognition in its social context. *Psychological Review*, *93*, 322–359.
- Zahn, D. S. (2000). An integrative neuroanatomical perspective on some subcortical substrates of adaptive responding with emphasis on the nucleus accumbens. *Neuroscience and Biobehavioral Reviews*, *24*, 85–105.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, *35*, 151–175.

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