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ScienceDirect
Journal of Experimental Social Psychology 43 (2007) 312–318
Journal of Experimental Social Psychology
www.elsevier.com/locate/jesp

In search of the nonconscious sources of goal pursuit: Accessibility and positive affective valence of the goal state ☆

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Received 8 May 2005; revised 6 February 2006
Available online 17 April 2006

Abstract

Two experiments tested the hypothesis that the mere priming of the representation of a goal state motivates people to pursue this state to the extent that it is associated with positive affect. In Experiment 1, all participants completed an affective priming task in which the goal concept of "socializing" was primed and tested for positive valence. Subsequently, they were given an instrumental task which provided the opportunity to pursue that state. It was established that participants put more effort in the task to attain the primed goal state when the implicitly assessed affective valence of the state was more positive. Experiment 2 replicated and extended these effects by showing that a stronger association of the goal state with positive affect—as assessed by the EAST—led to more effort to attain the state, but only when "socializing" was primed.

Keywords: Motivation; Automaticity; Implicit attitudes; Attitude–behavior relation

Where does our motivational behavior come from? What, for example, makes us suddenly get up from our chair and rush to a colleague's office for a quick gossip to beat the nearing lunch time? In most cases, when it comes to the causes of our acts and deeds, we can merely guess. That is, the actual sources of our behavior are often beyond the grasp of conscious awareness (e.g., Wegner, 2002; Wilson, 2002). Accordingly, it is no surprise that our behavioral goals and corresponding actions can originate in the unconscious as well (Bargh, 1990). In the present paper we examine how goal-directed, motivational behavior arises from such nonconscious sources.

Research on nonconscious goal pursuit has mainly, but successfully considered accessibility of the goal representation as a critical parameter in studying the nonconscious sources of motivational activity. A substantial number of studies show that priming goal concepts pertaining to behaviors or outcomes can instigate motivational activity aimed at attaining these goal states, without the actor being aware of this motivation or its origin (see Moskowitz, Li, & Kirk, 2004, for an overview). As a consequence of this priming, people have been found to become more persistent (Bargh, Gollwitzer, Lee Chai, Barndollar, & Trötschel, 2001) and expend more effort on tasks instrumental to attain the goal state (Aarts, Gollwitzer, & Hassin, 2004; Aarts et al., 2005): features that are characteristic for goal pursuit. Thus, accessible goal representations can instigate and guide motivational activity, without people being aware of the source of their goal pursuit.

Although this research has clearly demonstrated that enhanced accessibility of a goal concept promotes the occurrence of nonconscious, motivational behavior, the process by which priming of a goal state produces motivational goal-directed activity has hitherto received only little theoretical analysis and empirical attention. What endows the mere activation of a goal representation

☆ The work in this paper was supported by Grants from the Netherlands Organization for Scientific Research (NWO, 425-21-004; VIDI-Grant 452-02-047).
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0022-1031/$ - see front matter © 2006 Elsevier Inc. All rights reserved.
doi:10.1016/j.jesp.2006.02.005

with its unique power to motivate people to put valuable effort in realizing the goal state? Or in other words, how do people *nonconsciously* detect that the primed state is desired and worth pursuing?

Based on the notion that affective processes play a fundamental role in motivating human action without reaching conscious awareness (e.g., Cacioppo, Gardner, & Berntson, 1999; Dijksterhuis & Aarts, 2003; LeDoux, 1996; Tesser, Martin, & Cornell, 1996; Zajonc, 1980), we have recently proposed that positive affect that is directly attached to a goal state is capable of guiding a person to want, initiate, and work for the realization of the state without the need for a conscious intervention (Custers & Aarts, 2005). That is, inspired by previous work on this topic (Peak, 1955; Pervin, 1989; Young, 1961) we have suggested that a goal representation not only specifies the state or standard that is desired, but also contains the information that it *is* desired (see also Aarts & Hassin, 2005; Custers & Aarts, 2005).

In a recent series of experiments we have investigated this idea by testing whether manipulating the affective valence of neutral behavioral states influences people's motivational activity to attain those states (Custers & Aarts, 2005). Using an evaluative conditioning paradigm (see De Houwer, Thomas, & Baeyens, 2001), the affective valence of behavioral states was unobtrusively manipulated by presenting them subliminally to participants, paired with neutral or positive words. In other words, we directly attached positive affect to neutral goal states outside of participants' awareness. We established that when the affective valence of behavioral states was shaped more positively, participants showed enhanced motivational activity to attain those states.

In one of these studies (Custers & Aarts, 2005; Study 4), effects of shaping a behavioral state more positively were tested on the amount of effort expended to realize the state by observing performance on a task that was instrumental in attaining it. For some participants the affective valence of the behavioral state of "doing puzzles" was shaped more positively but for others it was not. After this manipulation, participants learned that they would complete a mouse-click task and that—if sufficient time was left—they would engage in an additional puzzle task. Thus, in this setting working faster (or harder) on the mouse-click task was instrumental in realizing the opportunity to engage in the puzzle task (see also Aarts et al., 2004). Results showed that participants worked faster on the mouse-click task if the affective valence of the behavioral state of doing puzzles was shaped more positively. Because the affective shaping of goals occurred outside of participants' conscious awareness, the findings provide support for the suggestion that the positive affective valence of an activated behavioral goal can serve as a nonconscious source of motivational activity aimed at realizing this goal.

In the present research, we aim to extend these findings in two important ways. First, in our previous work (Custers & Aarts, 2005) goals were created by rendering neutral goal states more positive. In the present studies we used a different approach by measuring the affective valence of preexisting goals. A positive correlation between the measured affective valence of an accessible goal state and expended effort to attain that state would provide further support for the claim that people pursue accessible goals to the extent that they preexist in their minds as a state associated with positive affect. Second, measuring—instead of manipulating—affective valence allowed us to separately investigate the effects of accessibility and affective valence of the goal state on motivational behavior. In our previous studies (Custers & Aarts, 2005), in which we used an evaluative conditioning paradigm, potential goal states were always rendered accessible by the manipulation of affective valence because they were primed subliminally together with positive or neutral word. Hence, whereas this previous work has shown that affective valence of the goal state predicts motivational behavior under conditions of increased accessibility of its representation, the present studies aimed to test the hypothesis that affective valence *only* guides motivational behavior when the goal state is mentally accessible. Such a finding would link the recent research on the role of positive affect in motivational behavior to the literature on goal priming by showing that people pursue states that are primed, but only to the extent that they preexist in their minds as a desired states associated with positive affect, i.e., as goals.

Experiment 1

As a first test of our hypothesis we investigated whether the affective valence of a goal state predicts motivational behavior aimed at attaining that state when the state is mentally accessible as a result of subliminal priming. For this purpose, we used an affective priming task to measure the affective valence of the concept of socializing (a concept that may be represented as a desired state or goal; Sheeran et al., 2005) and at the same time subliminally prime it. In the affective priming task (originally developed by Fazio, Sanbonmatsu, Powell, & Kardes, 1986) people categorize affective targets, that are preceded by affective primes, in terms of good or bad. The affective priming effect holds that people are faster and make less errors when the targets are preceded by an affectively congruent prime, but are slower and make more errors when targets are preceded by an incongruent prime (see for overviews Fazio, 2001; Klauer & Musch, 2003). Because the effect can show upon both response times and error rates depending on the participants' trade off between speed and accuracy, we used a response window technique to force participants to respond quickly (see Draine & Greenwald, 1998), thereby capitalizing on effects on error rates. Affective priming effects have been obtained with subliminal or masked primes (Frings & Wentura, 2003; Otten & Wentura, 1999; Wentura, Kulfanek, & Greve, 2005), which suggests that the affective valence of subliminally presented goal states could be inferred from people's responses to the targets.

By employing this subliminal affective priming task we were able to examine the relation between the affective valence of the goal and the amount of effort expended to attain the goal, under conditions of increased accessibility of the goal state. The amount of effort was measured using the mouse-click task that has been successfully used to measure subtle effects of goal priming on motivation (Aarts et al., 2004; Custers & Aarts, 2005). Although in this task participants can speed up their performance to take the opportunity to reach a given goal, subjective reports indicate that they are usually unaware of these enhanced motivational effects. Based on the notions introduced above, we predicted that when a subliminally primed goal has a more positive affective valence, participants will put more effort in a task (i.e., work faster) instrumental in attaining the goal.

Method

Participants and design

Forty-one Dutch undergraduates participated, earning €4 or course credits.

Materials

Based on previous work (Sheeran et al., 2005) five different verbs related to the goal of socializing were used to measure the affective valence of socializing and going out: "socializing," "going-out," "partying," "celebrating," and "dancing" (all single words in Dutch). Along with five negative and five positive nouns these socializing related words served as primes in the affective priming task. As targets, 10 negative and 10 positive adjectives were employed that were used as experimental targets by Moors and De Houwer (2001; Experiment 1).

Procedure

Participants worked in separate cubicles in which the experiment was presented on a computer with a 100-Hz screen. The experiment consisted of three consecutive tasks: the affective priming task, a mouse-click (filler) task, and a goal-relevant lottery task. Participants first worked on the affective priming task and learned afterwards that the experiment was almost completed and contained one more task. In addition, they were told that at the end of the experiment they would have the opportunity to engage in a lottery task, in which they could win tickets for a student dance-party in the city center, but that this lottery task would only be given if sufficient time was left. All participants then completed the mouse-click task, in which they had to work through a series of screens by clicking 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 lottery task (operationalized as participants' speed on the mouse-click task). After the mouse-click task, all participants completed the lottery task. At the end of this task they were informed that the winners of the lottery would be announced 1 week after the experiment.

Affective priming task

Participants learned that it was their task to evaluate the presented adjectives by pressing the "good" or "bad" key on the keyboard within a response window of 150 ms. No mention of the subliminal primes was made. The affective priming task was closely modeled after Frings and Wentura (2003; see also Draine and Greenwald, 1998). A trial consisted of the following subsequent presentations: a forward mask of random letters for 100 ms, the prime for 30 ms, a backward mask for 20 ms, and the target word for 300 ms. After presentation of the target word an exclamation mark appeared that signaled the beginning of the 150-ms response window. If participants responded within this window the exclamation mark turned red, signaling that their response was on time. If their response was too slow, the exclamation mark never changed color. If it was too early, the target word was erased and the exclamation mark never appeared. Participants were instructed to press the correct key within the response window, but also told that responding within the window was more important than being accurate. A new trial started 450 ms after the end of the response window.

The task started with 40 practice trials in which participants could familiarize themselves with the task at hand and practice on responding within the response window. Then the experiment started, which consisted of 10 blocks of 40 trials. In each block, the five words related to socializing, five non-words, as well as the five positive and negative words were each presented twice: once with a randomly selected positive and once with a randomly selected negative adjective. After each block participants received feedback about their percentage of correct answers and their average response time. Additionally they were told that their rate of correct responses should be in the range of 65–85%.

Awareness check

Following previous work (Aarts et al., 2004; Bargh et al., 2001; Custers & Aarts, 2005) participants completed an *awareness check* on the computer after the mouse-click task. They were asked to indicate on a 9-point response scale, ranging from *not at all* (1) to *absolutely* (9), whether they worked fast on the previous task to ensure that they could participate in the lottery task. Participants' (anonymous) responses thus served as a measure of conscious motivation to strive for the goal.

Debriefing

Finally, participants were thoroughly debriefed. The funneled debriefing indicated that none of the participants realized the true nature of the study. Furthermore, none of the participants indicated a relation between the affective priming and the mouse-click task.

Results

Affective valence of the goal state

If the goal would be positive, then the goal primes should decrease the number of errors on trials with positive

(congruent) targets, and increase the number of errors on trials with negative (incongruent) targets, compared to control trials on which non-words are presented. Hence, we expected the percentage of positive responses to be higher on trials with goal primes, than on control trials. The difference in the percentage of positive responses between goal prime trials and control trials, therefore reflects the affective valence of the goal.

We computed an index for goal valence by subtracting for each individual the z-scored percentage of positive responses on trials with nonword primes from that on trials with goal primes—a technique that is similar to computing the sensitivity measure d' in a signal detection task (see Frings & Wentura, 2003). Hence, a more positive index reflects a more positive valence of the goal. Goal valence proved overall positive, $M = .06$, $t(40) = 1.72$, $p = .09$.

Effort

A Pearson correlation was calculated between effort (the time spent on the mouse-click task) and goal valence. A negative correlation was found, $r = -.33$, $p = .04$, which indicates that the more positive the affective valence of socializing, the faster participants worked on the mouse-click task. Furthermore, a regression analysis was conducted in order to estimate the mean goal valence for fast and slow clickers (1 SD below or above the mean). For fast clickers goal valence was positive and different from zero, $M = 0.13$, $t(39) = 2.84$, $p = .01$, whereas for slow clickers it was neutral, $M = -0.01$, $t(39) = -0.25$, $p = .80$.

In order to test the specificity of the goal-effect, we first calculated two additional indices for the negative and positive filler words, by subtracting the z-scored percentage of positive responses on the control trials from that on trials with negative and positive primes, respectively. Effort did neither correlate with the valence of the positive ($r = .04$, $p = .82$), nor with that of the negative ($r = .00$, $p = .98$) words. Second, we computed an overall evaluation index for the filler words by subtracting the z-scored percentage of the positive responses on the trials with negative primes from that on the trials with positive primes. This index also proved to be uncorrelated with effort ($r = .04$, $p = .81$). Together, these results show that the correlation between valence and effort is specific to the goal.

Awareness check

Participants' explicit ratings of motivation to engage in the lottery task ($M = 4.78$, $SD = 2.13$) did not correlate with their actual expended effort on the mouse-click task, $r = .11$, $p = .50$, nor with goal valence, $r = -.03$, $p = .85$. After controlling for the effect of explicit motivation the correlation between the goal valence and expended effort remained significant, $r = -.33$, $p = .04$. Taken together, these results suggest that there is no strong association between consciously experienced striving for the goal of socializing and the actual goal-directed behavior resulting from the goal valence measured in the affective priming task.

Discussion

As hypothesized, the results show that the affective valence of the goal state was associated with the amount of effort participants expended to realize the state. Participants for whom the goal state was strongly associated with positive affect worked faster on the mouse-click task than those for whom the goal state had a less positive affective valence. Moreover, these results were obtain under conditions of increased accessibility of the goal concept, as the goal was repeatedly subliminally primed in the affective priming task. Participants were, however, not aware of the activation and operation of the goal, as was revealed by the awareness check and the post-experimental debriefing procedure.

Encouraged by these findings, we designed Experiment 2. Although it was conceptually similar to Experiment 1, we made two important modifications. Firstly, whereas in Experiment 1 all participants were primed with socializing in the affective priming task, in Experiment 2 we manipulated the accessibility of this goal state in a separate priming task before assessing people's effort on the mouse-click task. Secondly, as there has been some debate about the nature of subliminal affective priming effects (see e.g., Abrams & Greenwald, 2000), we aimed to replicate and extend the findings of Experiment 1 by administering a different implicit measure of affective valence: the Extrinsic Affective Simon Task (EAST; De Houwer, 2003).

In the EAST, participants have to evaluate white words presented on the screen by pressing a "good" or "bad" key and in the same task respond to colored words with the same keys (e.g., pressing "good" for green and "bad" for blue words). Thus, responses to colored words have an extrinsic response valence (e.g., good for green and bad for blue words) and an intrinsic response valence, which is the valence of the response that is automatically evoked by the word itself (good for positive and bad for negative words). Analogous to the affective priming task, responses for which extrinsic and intrinsic response valence are congruent should be faster that responses for which they are incongruent.

Based on the findings of Experiment 1, as well as the literature on goal priming, we expected the implicitly measured goal valence to be associated with motivational behavior, but only in the condition in which the goal state was rendered accessible by priming.

Experiment 2

Method

Participants and design

Fifty Dutch undergraduates participated, earning €4 or course credits.

Procedure

Participants learned that the experiment consisted of different sections, constructed by different researchers. As a

part of the first section, they engaged in a letter-detection task, in which the goal to socialize was primed or not. Afterwards, participant learned that this section of the experiment was almost completed and would be followed by one more task. Again, they were told that at the end of the section they would have the opportunity to engage in the goal-related lottery task that would only be given if there was sufficient time left. Participants then engaged in the mouse-click task and the lottery task. At the end of this task they were informed that the winners of the lottery would be announced 1 week after the experiment. Funneled debriefing revealed that participants were not aware of the primes that were presented in the letter-detection task or the relation between that task and the mouse-click task. After a 25-min filler task, that was presented as a separate experiment, participants completed the EAST.

Materials

Three words related to the construct of socializing were selected ("going-out," "partying," "dancing") and were used to prime the goal state in the priming task and to measure its affective valence in the EAST. Furthermore, based on a pilot study, two unrelated positive and five negative verbs were selected to serve as additional colored words in the EAST in order to use an equal number of negative and positive words and to make the purpose of the task less obvious. As white words the five positive and five negative words employed by De Houwer (2003; Experiment 2) were used.

Priming task

Participants performed a letter-detection task in which they had to indicate as quickly as possible, by pressing a key, whether a string of similar letters contained a capital or not. Half of the letter strings contained a capital. Before each letter string a prime word was subliminally presented (see for a similar procedure, Aarts et al., 2005). In the prime condition the three words related to the state of socializing and going out were used as primes. In the no-prime condition three different non-words were used. Each trial began with a fixation point for 500 ms. The prime (in capital letters) was presented for 10 ms, followed by a mask of random letters for 300 ms. Finally, the string of similar letters was presented and remained on the screen until a response was made. The inter-trial interval was 1500 ms. Each prime word was presented 15 times. Participants were randomly assigned to one of the two conditions.

EAST

The EAST was closely modeled after De Houwer (2003; Experiment 1). Participants were instructed to press a good or bad key depending on the affective valence or the color of words that were presented on the screen. They learned that responses to white words should be based on their affective valence, but that responses to words in blue or green should be made based on color. Half of the participants were instructed to press the good key for green words and the bad key for blue words. For the other half instructions were reversed.

The EAST, that was administered as a separate experiment, started with a practice block during which each of the 10 white words was presented twice in random order. During the second practice block the 10 nouns were presented, once in blue and once in green. Next, participants completed three test blocks of 30 trials. Instructions were given before every practice and test block, informing participants about what key to press in response to which type of stimulus. Test blocks started with four practice trials in which two positive and two negative adjectives (randomly selected from the adjectives list), were presented in white. In each block all five negative and five positive adjectives were presented in white and the ten verbs, including the three words related to socializing, were each presented twice: once in blue and once in green. In all blocks, stimuli were presented in random order. A trial started with a fixation point for 500 ms, followed by the target word that remained on the screen until the correct response was given. If participants made an incorrect response a red cross-appeared on the screen. The inter-trial interval was 1500 ms.

Results

Affective valence of the goal state

Only reaction times of correct responses to colored words were used in the analysis of the EAST data. Following De Houwer (2003), reaction times shorter than 300 ms or longer than 3000 were recoded to 300 and 3000 ms, respectively (0.03% of the responses) and thereupon all reaction times were log-transformed. It was found that responses to socializing related words were faster on trials that required a positive response ($M = 562$ ms) than on trials that required a negative response, $M = 589$ ms, $t(49) = 2.39$, $p = .02$, which reflects the positive valence of the goal state.

Next, we computed an EAST score for each individual participant by subtracting the mean log-transformed reaction time for the positive extrinsic responses from that of the negative extrinsic responses. Thus, a higher EAST score reflects a more positive affective valence.

Effort

To investigate the effects of goal priming and goal valence on expended effort on the mouse-click task, we subjected the time that participants spent on this task to a moderated hierarchical multiple regression analysis (Baron & Kenny, 1986), in which time on the mouse-click task was predicted by prime (no prime = 1, prime = 2), the EAST score, and the Prime × EAST score interaction term. To reduce multicollinearity bias, all variables were standardized before computing the cross-product (Dunlap & Kemery, 1987). Primed participants worked slightly faster on the filler task than no-primed participants. However, this priming effect did not reach the conventional level of significance, $\beta = -.18$, $t(46) = -1.29$,

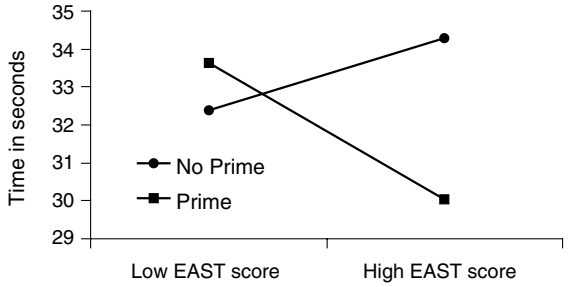

Fig. 1. Time spent on the mouse-click task as a function of goal valence (EAST score) and priming (Experiment 2).

$p = .20$. Furthermore, no effect of EAST score, $\beta = -.10$, $t(46) = -.72$, $p = .48$, was found. According to our hypothesis, however, time spent on the mouse-click task should only decrease as a function of the goal valence when the state is primed. Indeed, the prediction of time spent on the mouse-click task by prime and EAST score was improved by including the Prime × EAST score interaction term, $\beta = -.32$, $t(46) = -2.30$, $p = .03$.[1]

Specific analyses showed that the working time significantly decreased with the EAST score in the prime condition, $\beta = -.42$, $t(24) = -2.29$, $p = .03$, but not in the no-prime condition, $\beta = .23$, $t(22) = 1.09$, $p = .29$ (see Fig. 1). Furthermore, we examined the effect of priming on effort for high and low EAST scores (see Cohen, Cohen, West, & Aiken, 2003). When the EAST score was high (1 *SD* above the mean), effort increased significantly as a function of priming, $B = -2.12$, $t(46) = -2.60$, $p = .01$. This effect was absent when the EAST score was low (1 *SD* below the mean), $B = .62$, $t(46) = 0.73$, $p = .54$.

Additional regression analyses revealed that the crucial Prime × EAST score interaction was not present with EAST scores calculated for the goal-unrelated positive, $\beta = .14$, $t(46) = 0.97$, $p = .34$, and negative colored words $\beta = .02$, $t(46) = 0.13$, $p = .90$, which demonstrates the specificity-effect of the goal valence measure. Importantly, EAST scores for the positive and negative words did not predict effort in the prime condition, $\beta = .35$, $t(24) = 1.83$, $p = .08$, and $\beta = .18$, $t(24) = 0.89$, $p = .38$, respectively. Furthermore, in line with Experiment 1, an overall evaluation index for the filler words was computed by subtracting the mean log-transformed reaction times on congruent trials from those on incongruent trials. The interaction with prime was not significant, $\beta = .13$, $t(46) = 0.85$, $p = .40$, nor did this index predict effort within the prime condition $\beta = .12$, $t(24) = 0.60$, $p = .56$.

General discussion

The results of two experiments demonstrate that priming of a goal concept motivates people to pursue the goal to the extent that the goal concept is associated with positive affect. In Experiment 1, in which the goal state of socializing was primed and its affective valence assessed in an affective priming task, participants exhibited more effort on a task instrumental in attaining the goal state when this state had a more positive affective valence. Experiment 2 replicated and extended these effects by showing that a more positive goal valence—as assessed in the EAST—corresponded with increased effort to attain the state, but only when socializing was subliminally primed in an earlier task. These effects on goal-directed, motivational behavior were nonconscious in the sense that participants were unaware of the source and actual striving of their goal pursuits, as was substantiated by the utilization of the subliminal priming procedure, the awareness check and post-experimental debriefing.

These findings first of all provide new and important support for the hypothesis that motivational behavior to attain an accessible goal state depends on the affective valence of the goal concept (Custers & Aarts, 2005). Moreover, they extend this work by (1) demonstrating this effect for preexisting personal goals instead of experimentally created goals, and (2) showing that this motivating effect of positive affective valence only manifests itself when the goal state is rendered accessible by priming—an effect that we speculated on, but did not demonstrate in earlier work (see Custers & Aarts, 2005).

Thus, whereas the mechanism by which goal priming produces motivational behavior has received little theoretical and empirical attention, the present findings provide a first glimpse of the underlying processes. They suggest that people only engage in motivational behavior to attain a goal if the primed goal concept is associated with positive affect, and that they are able to automatically detect the affective valence of the goal concept. This implies that priming of a goal concept does not necessarily motivate people to attain that goal. It only does so when the primed concept is represented as a desired state or a goal that preexists in their minds.

Moreover, the suggestion that detection of affective valence or incentive value plays an important role in nonconscious goal pursuit provides a new perspective on the way in which automatic evaluations may influence behavior. Although these automatic evaluations have been demonstrated to evoke immediate, reflex-like approach and avoidance reactions to objects or stimuli that are perceived in the environment (see Strack & Deutsch, 2004), the current results suggest that they may also play a role in guiding more complex behaviors nonconsciously (cf. Ferguson & Bargh, 2004). Hence, our social environment may automatically guide people's behavior through an intricate interplay of perceptual, evaluative and motivational systems (Bargh, 1997).

Although it is often hard for people to grasp the actual sources of their behavior, with the present study we have tried to do just that by zooming in on the mental processes underlying nonconscious goal pursuit. The picture that

[1] Identical analyses with the untransformed reaction times yielded the same pattern of results.

emerges portrays a mental system in which two sources—accessibility of the goal state and its detected affective valence—work together in order to produce motivational, goal-directed behavior. Therefore, considering sources of motivational behavior besides accessibility of the goal representation may help us to advance our understanding of nonconscious goal pursuit and enable us to predict the conditions under which goal priming effects will, or will not occur.

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