

# On Becoming Ready to Pursue a Goal You Don't Know You Have: Effects of Nonconscious Goals on Evaluative Readiness

Melissa J. Ferguson  
Cornell University

Findings showed that the nonconscious activation of a goal in memory led to increased positive implicit attitudes toward stimuli that could facilitate the goal. This *evaluative readiness* to pursue the nonconscious goal emerged even when participants were consciously unaware of the goal-relevant stimuli. The effect emerged the most strongly for those with some skill at the goal and for those for whom the goal was most currently important. The effect of implicit goal activation on implicit attitudes emerged in both an immediate condition as well as a delay condition, suggesting that a goal rather than a nonmotivational construct was activated. Participants' implicit attitudes toward a nonconscious goal also predicted their goal-relevant behavior. These findings suggest that people can become evaluatively ready to pursue a goal whenever it has been activated—a readiness that apparently does not require conscious awareness or deliberation about either the goal or the goal-relevant stimuli. Theoretical implications of this type of implicit goal readiness are discussed.

*Keywords:* nonconscious goal pursuit, automatic attitudes, subliminal perception

Recent work in social psychology suggests that people can pursue a goal without the awareness or intention of doing so. After people have been implicitly primed with cues closely linked in their memory with striving toward an endpoint, they display behavior that meets classical criteria of motivation, such as persistence and resumption after an interruption (e.g., Aarts & Dijksterhuis, 2000; Aarts, Gollwitzer, & Hassin, 2004; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Chartrand & Bargh, 1996; Fitzsimons & Bargh, 2003; Moskowitz, Li, & Kirk, 2004; Shah, 2003; Shah, Friedman, & Kruglanski, 2002; Shah & Kruglanski, 2002, 2003). For instance, people who completed a crossword puzzle that contained words related to achievement subsequently performed better and persisted longer on other word puzzles, even when a more enjoyable task (i.e., looking at cartoons) was available (Bargh et al., 2001). Most of the research in this area has focused on demonstrating the behavioral effects that follow from the implicit activation of a goal. But, relatively less research has examined the specific mental operations that help to convert the implicit activation of a goal into the relevant behavioral effects (Custers & Aarts, 2005; McCulloch, Ferguson, Kawada, & Bargh, 2008). What kinds of implicit processes transport us from the goal to the goal pursuit?

An arguably essential prerequisite of successfully pursuing any goal is reclassifying the stimuli around us as desirable or not

according to the goal. Specifically, people should evaluate those stimuli that can help them to fulfill the goal as more desirable, compared with when they are not pursuing the goal. Given the overwhelming evidence that people approach those things they desire most, this kind of shift in evaluation according to the goal seems critical for being able to increasingly select goal-relevant over goal-irrelevant actions. Empirical evidence shows that conscious goals do lead to this kind of shift in evaluations. As soon as we become hungry, we tend to see the sandwich sitting on the table as more desirable (see, e.g., Cabanac, 1971). More recent evidence shows that people's conscious goals influence even those evaluations they generate within milliseconds after perceiving stimuli. While consciously pursuing a goal, people rapidly and spontaneously evaluate goal-relevant stimuli as significantly more desirable (Ferguson & Bargh, 2004; Seibt, Häfner, & Deutsch, 2007; Sherman, Presson, Chassin, Rose, & Koch, 2003). Moreover, this effect of a goal on people's evaluations exists only while they are actively pursuing the goal. As soon as a person meets his or her goal, he or she no longer evaluates goal-related stimuli as positively. For example, people who were thirsty spontaneously evaluated stimuli related to the goal (e.g., *water, juice*) as significantly more desirable than those who had quenched their thirst only minutes earlier (Ferguson & Bargh, 2004, Experiment 1; see also Sherman et al., 2003). This work implies that the activation of a conscious goal triggers an *evaluative readiness* to pursue it and that this evaluative readiness disappears after the goal has been reached.<sup>1</sup>

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Correspondence concerning this article should be addressed to Melissa J. Ferguson, Department of Psychology, Cornell University, 211 Uris Hall, Ithaca, NY 14853. E-mail: mjf44@cornell.edu

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<sup>1</sup> Researchers have long argued that the activation of a goal makes goal-related knowledge in general more accessible (e.g., Aarts et al., 2001; Anderson, 1983; Bruner, 1957; Goschke & Kuhl, 1993; Higgins & King, 1981; Moskowitz, 2002), and Bruner (1957) characterized this effect as "perceptual readiness." I discuss evaluative versus perceptual readiness in more detail in the General Discussion section.

Does the *nonconscious* activation of a goal also lead to a reappraisal of what is most desirable in the environment? On the one hand, such a shift in evaluations would seem to be an essential part of the explanation of how a goal influences and guides behavior. After all, people are drawn toward desirable things and repelled by unpleasant things, and so changing what one regards as good and bad in one's surroundings would seem a prerequisite to changing his or her behavior. Evidence that nonconscious goals trigger an evaluative readiness to pursue them would in part reveal how nonconscious goals operate. On the other hand, this kind of shift in one's evaluations of the desirability of stimuli may constitute a unique characteristic of *conscious* goal pursuit. It may require the intentional rumination, planning, and deliberation that are part and parcel of conscious goal pursuit (e.g., Ajzen, 1991; Bandura, 1986; Deci & Ryan, 1985; Locke & Latham, 1990). If it is unique to conscious goal pursuit, then it would indicate that the two types of goal pursuit unfold in different ways (see Bargh et al., 2001; Chartrand & Bargh, 1996; McCulloch et al., 2008).

The primary objective of the present article was to test whether the nonconscious activation of a goal leads to an evaluative readiness to pursue it. In order to test this, it is necessary to preclude as much as possible any opportunity for participants to consciously ruminate about either the goal or the stimuli relevant to the goal. A double-barreled methodological approach—in which both the goal and the attitudes toward the goal-relevant stimuli are activated implicitly—is therefore adopted. A secondary objective of the article was to identify possible boundaries of the effect of a goal on evaluative readiness. Should the activation of a goal, whether conscious or nonconscious, lead to the same amount of evaluative readiness for everyone? There are multiple reasons to expect that those who are skilled at a particular goal should be especially likely to show this kind of implicit preparedness to pursue that goal. Additionally, only those who regard the goal as currently desirable should become evaluatively ready to pursue it once it has been activated. Below I consider these issues in more detail.

### How Conscious Goals Lead to Evaluative Readiness

What is the evidence for evaluative readiness? Early work on this topic by Cabanac (1971) showed that participants who had been fasting explicitly rated high-sucrose stimuli as more positive than those who had just sated their hunger. Evidence for evaluative readiness with a wider array of goals and goal-relevant stimuli has been found in more recent work (Ferguson & Bargh, 2004; Seibt et al., 2007; Sherman et al., 2003). This work suggests that conscious goals even influence evaluations that are generated rapidly (within milliseconds) and unintentionally versus relatively more slowly and deliberately.<sup>2</sup> For example, Sherman et al. (2003) found that heavy smokers who were going through nicotine withdrawal implicitly evaluated smoking paraphernalia (e.g., cigarettes, ashtrays) more positively than smokers who had just recently smoked. Ferguson and Bargh (2004) showed that those motivated to perform well on a word game implicitly evaluated words such as *achieve* and *win* more positively compared with those who had just fulfilled the goal and with those who never had the goal.<sup>3</sup> Together, these findings suggest that the conscious activation of a goal increases one's rapidly and spontaneously generated positivity toward stimuli that can facilitate the goal.

But, how might such an effect happen? To start with, it is useful to consider how attitudes are generated. An attitude toward a given stimulus is assumed to depend on how that stimulus is interpreted, which, in turn, depends on what memories relevant to the stimulus are most accessible (e.g., Abelson, 1976, 1981; Barsalou, 1992; Carlston, 1994; Carlston & Smith, 1996; Fishbein & Ajzen, 1975; Fiske & Pavelchak, 1986; Schank & Abelson, 1977; E. R. Smith, 1992, 1998; E. R. Smith & Zarate, 1992). As an example, the word *dog* would be interpreted (constructed) differently depending on the relative accessibility of memories related to puppies versus attack dogs. Because the individual memories related to any given stimulus can differ in their evaluative connotation, the evaluation of the stimulus also naturally depends on what memories are most accessible (e.g., Bassili & Brown, 2005; Dasgupta & Greenwald, 2001; Fazio, 1989, 1995, 2001; Ferguson & Bargh, 2003; Greenwald, 1990; Livingston & Brewer, 2002; Mitchell, Nosek, & Banaji, 2003; Rosenberg, 1956; Schwarz & Bohner, 2001; E. R. Smith, 1997, 2000; Wittenbrink, Judd, & Park, 2001).<sup>4</sup> *Dog* might be evaluated as more positive when memories about puppies versus attack dogs are most accessible.

Given the above perspective, the activation of a goal might change how someone evaluates a goal-relevant stimulus because it changes the accessibility of particular memories related to that stimulus (see Ferguson & Bargh, 2004). So, thirsty people may automatically evaluate *water* as more positive because the activation of the thirst goal makes positively valenced memories related to water (e.g., its refreshing nature) more accessible, and, possibly, negative memories about water more inhibited, than when the goal is not activated. This claim is supported by the theoretical perspective of goals as structures in memory with facilitative links to means, objects, and knowledge that are relevant or helpful to the goal, and inhibitory links to objects, activities, and knowledge that may undermine the goal (Bargh, 1990; Fishbach & Ferguson, 2007; Kruglanski, 1996; Kruglanski et al., 2002; Shah, 2005). It is also in line with research showing that goal activation leads to changes in the accessibility of goal-relevant memories (e.g., Aarts, Dijksterhuis, & De Vries, 2001; Förster, Liberman, & Higgins, 2005; Moskowitz, 2002).

### Do Nonconscious Goals Lead to Evaluative Readiness?

How much conscious guidance and intention are required for the activation of a goal to increase the desirability of relevant stimuli?

<sup>2</sup> Attitudes that are generated spontaneously and rapidly are commonly characterized as *automatic* or *implicit*, and I adopt these terms interchangeably throughout the article.

<sup>3</sup> Sherman et al. (2003) and Ferguson and Bargh (2004) also found that conscious goals only led to changes on implicit, but not explicit, attitudes. Why might this be the case? It may be that evaluations that are generated rapidly and spontaneously, without the chance for strategic editing or modifying, are more reflective of a current goal's temporary influence. When people are explicitly reporting their evaluations, they may be unduly biased by their own theories of the stability of their attitudes or normative or presentational pressures (see, e.g., Schwarz & Bohner, 2001).

<sup>4</sup> The notion that an attitude toward a stimulus depends on the memories that are recruited on the perception of that stimulus is largely empirically and functionally (but not necessarily theoretically) indistinguishable from the notion that an attitude toward a stimulus depends on how that stimulus is categorized (see also Fiske & Pavelchak, 1986).

Even if associations in memory do exist between a given goal and positive memories of goal-relevant stimuli, conscious processing may be required for the former to activate the latter (e.g., Neely, 1977; Posner & Snyder, 1975). Conscious processing is obviously needed for some kinds of knowledge integration and processing (e.g., reading a sentence), and the effect of a goal on changes in the desirability of relevant stimuli may be one of them. Thus, the reranking of the desirability of stimuli according to one's current goal may require some awareness of both the goal and the stimuli relevant to the goal.

Not only did previous research on evaluative readiness not address this issue, it actually allowed for considerable conscious reflection and deliberation concerning the goal. In every previous study on this topic, participants had ample time, opportunity, and presumably the inclination (see Bandura, 1997; Oettingen & Gollwitzer, 2001, 2002) to think consciously about attaining the goal. For example, the smokers in the Sherman et al. (2003) experiments could have been thinking (even obsessing) about how good a cigarette would be. And, in each experiment by Ferguson and Bargh (2004), people were put into a goal state in an explicit manner and could have been thinking consciously about how certain stimuli or activities would satisfy it. This means that participants' ability to ruminate consciously about the goal and how to meet it could have easily led to their evaluative readiness. In other words, even though participants' attitudes toward the goal-relevant stimuli were activated implicitly as soon as they perceived those stimuli, the attitudes may have depended on participants having *consciously* and *intentionally* reframed the stimuli in line with the goal beforehand.

Previous work on evaluative readiness also potentially allowed for strategic processing of the goal-relevant stimuli. Although attitudes were measured in an unobtrusive, implicit manner, as noted, participants were able to consciously perceive the attitude objects and thus may have been able to use some kind of goal-relevant, strategic processing at some point in the attitude task (see, e.g., Klauer, Roßnagel, & Musch, 1997). Especially for people who are in a goal state, the conscious perception of a goal-relevant stimulus—even within an implicit measure—may trigger strategic or intentional types of processing that are hard to quantify or identify. In order to test whether a goal can *nonconsciously* initiate evaluative readiness, it is necessary to ensure that participants are not consciously processing even the goal-relevant stimuli. Any evidence for evaluative readiness under these conditions would indicate that people are able to enhance the desirability of stimuli they do not consciously notice according to a goal they do not realize is active in memory.

### Identifying Moderators of Evaluative Readiness

#### *Skill at the Goal*

Regardless of whether a goal is activated consciously or nonconsciously, should everyone be expected to show evaluative readiness for any goal whenever it becomes active? The attitudes literature suggests that attitudes reflect a person's *typical* approach and avoidance behaviors toward the corresponding stimuli within a given context (for reviews, see Fazio & Olson, 2003; Petty, Fazio, & Briñol, in press; Wittenbrink & Schwarz, 2007). This implies that those who display more positive attitudes toward

goal-relevant stimuli whenever the goal is active should, on average, be more likely to approach such stimuli. And, it seems reasonable to predict that those who are more (vs. less) likely to approach goal-relevant stimuli during goal pursuit should be more likely to attain the goal successfully. This assumption suggests that the more one demonstrates evaluative readiness for a certain goal, the more skilled they should be at the goal on average. This means that evaluative readiness for a given goal might be an implicit *signature* of the person's skill at the goal. This proposed relationship between skill and evaluative readiness is measured in the present experiments.

But what is the causal direction here? Does skill at a goal lead to evaluative readiness to pursue the goal, or does evaluative readiness for a goal lead to skill? Both are probably true. First, skill at a goal should foster the development of an evaluative readiness to pursue the goal whenever it is active. Those people who, for whatever reasons, tend to desire and then approach goal-relevant stimuli successfully whenever the goal is active should, over time, develop strong associations in memory between the goal and positively valenced aspects of the goal-relevant stimuli. This means that for those with some amount of success at the goal, after a while, the activation of a goal should (either consciously or nonconsciously) tend to activate desirable and positive aspects of goal-relevant stimuli. Thus, skill should lead to evaluative readiness.

However, there is also reason to expect that, regardless of how evaluative readiness initially develops, it should thereafter further enable effective goal pursuit (i.e., increase skill). The more rapidly and spontaneously one can generate positive attitudes toward goal-relevant stimuli whenever the goal is active, the easier that person's goal pursuit should be. Considerable evidence attests to the benefits of spontaneously activated attitudes for decision making and behavior (e.g., Fazio, 1989; Fazio, Blascovich, & Driscoll, 1992; Fazio & Powell, 1997; Roskos-Ewoldsen & Fazio, 1992), especially compared with the costs demanded by more conscious, deliberate cognition (see, e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998). For example, whereas a skilled individual might have to at first think effortfully about and purposefully choose to go to the library in order to do well academically, as soon as that person develops an association between the goal and a positive attitude toward the library, he or she should be able to enact that approach behavior more easily whenever the goal is activated. Thus, to the extent that implicit attitudes can influence and guide behavior, the more one becomes evaluatively ready once a goal has been activated, the more successful that person should be at attaining the goal. This suggests that evaluative readiness should enhance one's skill at the goal.

From this perspective, the relationship between skill and evaluative readiness is probably iterative: The more a person becomes skilled at a goal, the more he or she should develop an evaluative readiness to pursue that goal. And, the more one develops evaluative readiness, the more he or she should be able to master the goal effortlessly. Regardless, both possibilities predict that one's chronic skill at a goal should moderate whether the activation of that goal leads to evaluative readiness to pursue. I expect therefore that whenever there is some variability in people's success at a goal, skill should be a significant moderator of the effect of that goal on evaluative readiness. However, when most people are skilled at a goal (e.g., sating thirst or hunger), they should show evaluative readiness whenever the goal is active (see Ferguson & Bargh, 2004; Sherman et al., 2003). Whereas only

easily attainable goals were examined in previous work, in this article I also examined goals with a greater variability of success in order to test this prediction.

### *Motivation for the Goal*

Will a person's motivation for a goal determine whether that goal will implicitly trigger an evaluative readiness to pursue it? For example, will a person who is implicitly primed with an undesirable goal become evaluatively ready to pursue it? Recent work suggests that people do not seem to pursue implicitly primed goals that are perceived as undesirable. Aarts et al. (2004) implicitly primed male participants with the (normatively desirable) goal to seek casual sex by having them read a vignette about a man trying to pick up a woman in a bar. Male participants who were primed in this way subsequently showed significantly more willingness to help a female but not a male experimenter, suggesting that they were implicitly pursuing the goal. However, when Aarts et al. (2004) made the goal less desirable (i.e., the man who was trying to pick up the woman in the bar was described as having a girlfriend and new baby at home), male participants did not show any evidence of implicit goal pursuit. This work suggests that it may be difficult to implicitly prime a goal that people have little or no motivation to pursue.

How might one measure how much motivation a person has for an implicitly primed goal at any given moment? One possibility is to ask participants to report their motivation explicitly. And yet, this seems a potentially limited methodological strategy given that people's explicitly reported motivation may not always accurately reflect the current importance of the implicitly activated goal (e.g., Custers & Aarts, 2005; Ferguson, 2007; Wilson & Dunn, 2004). Another option is to gauge the current desirability or importance of the goal to the person more indirectly. In several of the experiments, I measured people's explicitly reported motivation, and in one experiment I used a more indirect index of goal importance. Whereas people's explicit motivation for the goal may not turn out to be predictive of the impact of the goal on evaluative readiness, a more indirect and objective index should be.

### The Present Research

A series of six experiments tested the three predictions. The first and primary prediction is that the implicit activation of a goal can lead to an evaluative readiness to pursue the goal. This prediction was tested in five of the six experiments. In these five experiments, the goal and the attitudes were activated implicitly using a variety of methodologies. Additionally, the last experiment tested whether participants' evaluative readiness for a goal predicted their behavioral pursuit of the goal.

The second prediction is that the effect of a goal on evaluative readiness should occur most strongly for those who are highly skilled at that goal. This prediction was tested in four of the six experiments. And, the third prediction is that the effect of a goal on evaluative readiness should emerge most strongly for those who are highly motivated to pursue the goal at that moment. The moderating effect of motivation may emerge only with indirect, rather than explicit, measures of motivation.

### Experiment 1a

Participants read words embedded within a scrambled sentences task disguised as a linguistic task (see Srull & Wyer, 1979). Some of those words were related to an academic achievement goal (e.g., *studying, smart*) or were not (e.g., *moving, new*). The mere exposure to words strongly related to a given goal is sufficient to activate that goal implicitly (e.g., Aarts et al., 2004; Bargh et al., 2001; Chartrand & Bargh, 1996; Fishbach, Friedman, & Kruglanski, 2003; Fitzsimons & Bargh, 2003; Shah, 2003). Participants then completed a measure of their attitudes (e.g., Fazio, Sanbonmatsu, Powell, & Kardes, 1986) toward stimuli that were either facilitative of the primed goal (e.g., *library*) or not (e.g., *window*). The stimuli were presented subliminally, ensuring that participants' attitudes toward them were generated largely without their awareness, intention, or control (Olson & Fazio, 2002).

In addition to a control condition in which no goal was primed, I also included a second control condition in which participants were primed with a social goal. This ensured that some of the participants would be in a motivational state, but not focused on academics. Given that students routinely rate both social and academic goals as highly important, a social goal was expected to possess considerable motivational relevancy, but with a nonacademic focus.

The inclusion of a social goal condition also allowed an examination of how those who are skilled (or not) at the academic achievement goal would evaluate academic stimuli after being primed with a social goal. Some research suggests that those who are skilled at academics might become focused on their academic goal when confronted with the competing goal of a social life (Fishbach et al., 2003). Fishbach et al. (2003) found that those who were skilled at academics showed greater accessibility of academic words (e.g., *school*) after being primed with social temptations (e.g., *TV, procrastinate*). At first glance, this work suggests that skilled participants in the present experiment might evaluate the academic primes positively even when primed with a social goal. However, whereas Fishbach and colleagues used social activities in their work that are commonly thought of as temptations (e.g., *procrastination, TV*), participants in this case were primed with words that related to the social goal more broadly, emphasizing the importance of maintaining friendships and enjoying social activities. Thus, in this experiment, participants were primed with important aspects of a social goal (see, e.g., Baumeister & Leary, 1995) rather than with those aspects that are commonly thought of as tempting and therefore deserving of self-control efforts. For this reason, I expected that participants who are skilled at academics should automatically evaluate the academic primes as significantly more positive when primed with the academic goal, compared with the social goal.<sup>5</sup>

<sup>5</sup> In related work, Fishbach and colleagues (Fishbach & Trope, 2005; Trope & Fishbach, 2000) also found that participants who faced a short-term temptation (e.g., the prospect of social activities) bolstered their explicit positive rating of a more important activity (e.g., taking an upcoming exam). However, these effects emerged when the temptation would have immediately interfered with the important goal. In the present experiment, in contrast, the social and academic goals were not directly and obviously pitted against one another in the short term, and therefore such self-control efforts were not expected.

More broadly, given the tremendous importance to students of both social (e.g., Baumeister & Leary, 1995; Williams, Forgas, & von Hippel, 2005) and academic goals, it would seem beneficial for students to be able to focus on one or the other, depending on the situation. With this in mind, those who are skilled at academics should become evaluatively ready to pursue the academic achievement goal only in an academic context, and not when another unrelated, yet still centrally important, goal has been primed.

### Method

**Participants.** Eighty-seven undergraduates (60 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

**Materials.** In order to prime the academic achievement or social goal, or neither, participants were asked to complete a scrambled sentence task, a method that has been shown to activate a construct outside of the respondent's awareness (Bargh & Chartrand, 2000; Srull & Wyer, 1979). Participants were asked to create grammatically correct four-word sentences out of multiple five-word groups. All participants completed 30 sentences. In each of 15 sentences, one of the words in the group was directly or indirectly related to a social goal (e.g., fun, friendly, laughing, social), an academic achievement goal (e.g., smart, studying, graduation, school), or neither (e.g., new, outside, moving).

In the automatic attitude measure, the words *grades*, *books*, and *library* were selected as the goal-relevant primes. The control primes in the attitude measure were not related to either the academic or social goal (e.g., *chair*, *window*, *inside*, *color*). (Pilot data from previous studies established that the control words are automatically evaluated in a relatively neutral fashion.) The target words were strongly valenced adjectives (e.g., *excellent*, *disgusting*) that have been used in previous studies (e.g., Bargh, Chaiken, Govender, & Pratto, 1992). There were 24 adjectives, and these were rotated through the trials (see below).

**Procedure.** On arrival to the lab, participants were given a linguistic questionnaire and were instructed to form grammatically correct sentences from groups of scrambled words. They were randomly assigned to either a social, academic, or control condition. The questionnaire was administered in an envelope to ensure that the experimenter was unaware of their condition.

Participants were then asked to complete a computer task (i.e., the attitude measure) and were told that they would be deciding whether each of a series of words is good or bad. The task was actually an implicit attitude measure (see Olson & Fazio, 2002) and consisted of subliminally presented primes, followed by supraliminally presented targets about which participants had to make an evaluative decision. The screen refresh rate of each computer monitor was set at 72 Hz (a refresh rate of 14 ms). In each trial, a nonsense string of alphanumeric characters appeared in the center of the screen for 56 ms (four refreshment cycles) and was followed by the presentation of either an academic or a control prime for 28 ms (two refreshment cycles). Immediately following the prime stimulus, the same alphanumeric string appeared for 42 ms (three cycles). Ninety-eight milliseconds later, a target adjective then appeared in the center of the screen, and participants were told to indicate whether each target seemed good or bad as quickly and as accurately as possible. Participants were told that nonsense stimuli would flash before the targets and that these flashes were

meant to prepare the participant to respond. Participants completed 16 practice trials that did not contain any prime stimuli. They then completed two blocks of trials that each contained either a control or an academic prime. Each academic prime appeared twice with a positive target and twice with a negative target. Each control prime appeared four times with a positive target and four times with a negative target. After participants had finished the attitude measure, they completed a questionnaire with filler and demographic questions, including one about their grade point average (GPA).

Participants were then given a comprehensive funneled debriefing questionnaire in which they were asked to speculate about the general purpose of the study and whether they noticed or saw anything unusual in either the linguistic (goal priming) task or the computer (attitude) task. They were also asked specifically whether they noticed any themes in the sentences and also whether they had seen any words appear before the targets in the computer task. They were then debriefed about the purpose of the experiment, thanked for their participation, and dismissed.

### Results

None of the participants reported noticing anything unusual, or any academic or social theme, in the linguistic task, and no one reported any awareness of words being flashed in the computer task. One participant used the wrong keys for the computer task, and so the participant's responses were not recorded by the computer.

Only correct responses were included in the analyses. There was a 2% error rate across participants. Reaction times (RTs) that were faster than 250 ms and slower by more than three standard deviations from each individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses using untransformed means are reported. Facilitation scores were computed to reflect the positivity of participants' automatic attitudes toward the academic primes and also toward the control primes. Participants' RTs to the positive targets that followed the academic primes were subtracted from their RTs to the negative targets that followed the academic primes. The same computation was done for the control primes.

The hypotheses were tested using multiple linear regression analyses. All continuous predictors were centered (see Aiken & West, 1991). Automatic positivity toward the academic primes was regressed onto the goal priming condition (using two dummy variables, the academic achievement condition was coded as 11, the control condition was coded as 01, and the social condition was coded as 00), academic skill, automatic positivity toward the control primes, and the interaction between goal priming and skill. As shown in Table 1, the only significant predictor was the expected interaction between goal priming condition and skill ( $B = 122.40$ ,  $SE = 53$ ,  $t = 2.29$ ,  $p < .03$ ). To examine this interaction, a simple regression analysis was performed in each of the three goal priming conditions. In each condition, automatic positivity toward the academic primes was regressed onto skill. Skill was not a significant predictor in either the social goal or control condition (both  $ps > .19$ ). However, in the academic priming condition, skill marginally significantly predicted automatic attitudes toward the academic words ( $B = 86.64$ ,  $SE = 46$ ,

Table 1  
Summary of Multiple Linear Regression Analysis for Variables Predicting Automatic Positivity Toward Goal-Relevant Primes in Experiment 1a

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Goal condition: Dummy Variable 1 (D1)	13.31	23.8	.07
Goal condition: Dummy Variable 2 (D2)	-8.75	24.4	-.05
Skill	-35.15	29.1	-.16
Automatic positivity toward control primes	0.03	0.18	.02
D1 $\times$ D2 $\times$ Skill	122.40	53.53	.30*

Note.  $R^2 = .07$ .

\*  $p < .05$ .

$t = 1.86, p = .075$ ). The interaction between goal priming and skill is graphically displayed in Figure 1 using skill scores one standard deviation above or below the grand mean (Aiken & West, 1991).

In order to further test whether the independent variables of interest (goal condition and skill) uniquely predict responses to targets that follow *goal* versus *control* primes, I conducted some additional analyses. First, I conducted a mixed model analysis in order to predict the difference in RT to positive versus negative targets as a function of goal condition (using the two dummy variables), skill, and the type of prime that preceded the targets

(goal vs. control prime). I expected that the interaction between goal condition and skill should further depend on the type of prime preceding the targets. As expected, the four-way interaction between the two dummy variables for goal condition, skill, and type of prime (goal vs. control) was significant,  $F(2, 80) = 3.1, p = .053$ . I also ran a “reverse-order” regression model predicting positivity toward the *control* primes, with all the factors of interest as predictors, including positivity toward the *goal* primes. I wanted to examine specifically whether the interaction term that significantly predicted *goal*-prime responses in the regression analysis described earlier would still be significant when predicting *control*-prime responses. I expected that it would not, and this was the case. The three-way interaction between the two dummy variables (for goal condition) and skill was not significant in this regression analysis ( $t = -0.97, p > .3$ ).

### Discussion

The findings show that the implicit activation of a goal leads to an evaluative readiness to pursue it. Additionally, those who were most skilled at the academic goal were the most likely to show evaluative readiness for that goal. Skilled participants automatically evaluated the academic primes in a significantly more positive manner when implicitly primed with an academic goal, compared with both a social goal and a control condition. This effect emerged even though participants reported no awareness of the implicitly activated goal. Furthermore, participants' attitudes were

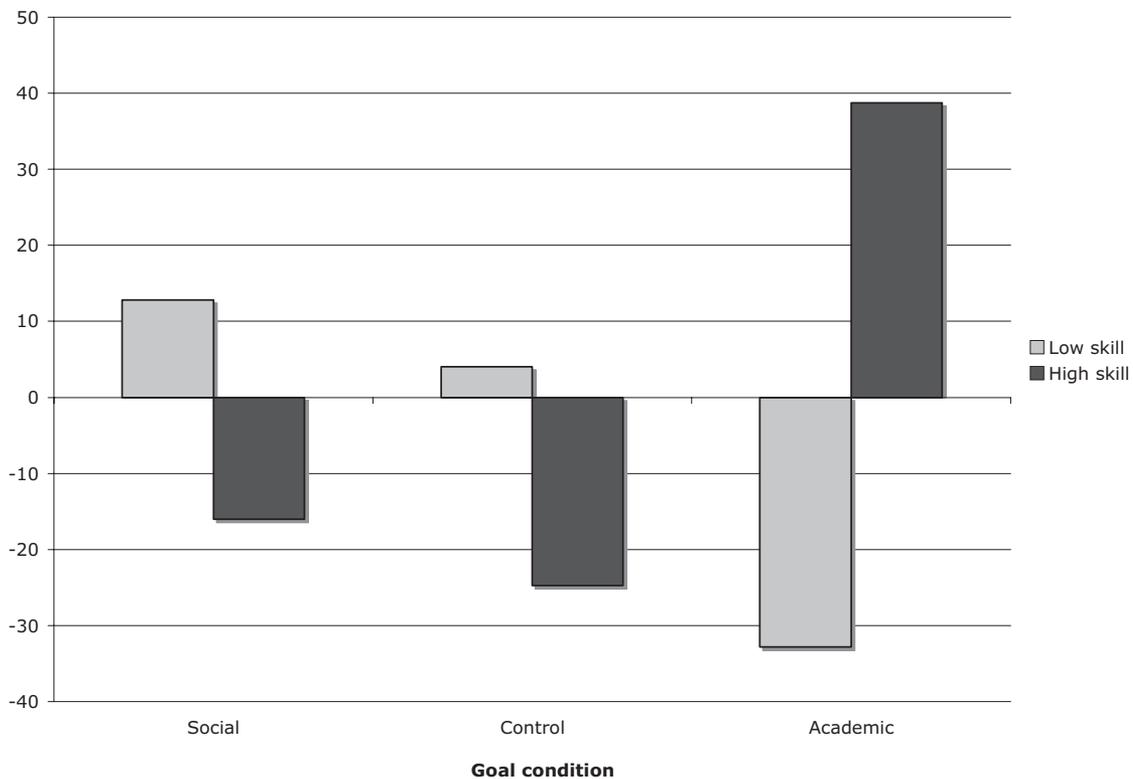


Figure 1. Automatic positivity toward academic stimuli as a function of priming condition and academic achievement skill.

measured using a (partially) subliminal task, ensuring that the attitudes were activated without participants' awareness, intention, or control.

The findings also address how skilled people respond to potential goal conflict. Research suggests that people who are skilled at a goal may think about that goal more, and explicitly evaluate that goal more positively, when faced with threats to that goal (Fishbach et al., 2003; Fishbach & Trope, 2005; Trope & Fishbach, 2000). On the one hand, this work suggests that whenever people who are skilled at a goal encounter stimuli that compete with that, they increase their adherence and commitment to their focal goal. However, the present work shows that this is not the whole story. Although skilled people may bolster the importance of a goal when facing clear threats to it, the present results suggest that they do not have that goal perpetually "turned on." It may be that such counteractive control is enacted only when an alternative to the focal goal is threatening in an unambiguous (e.g., a well-established temptation) and immediate (e.g., an impending behavioral conflict) manner.

One question that arises from these first findings, however, is whether skill moderates people's evaluative readiness for only nonconscious goals. After all, perhaps part of the benefit of *conscious* goal deliberation and intention is that people are able to prepare mentally and evaluatively to meet that goal regardless of their skill level. Nonconscious goal pursuit may be somewhat more limited in the sense that it depends on the success of people's previous experiences with that goal. The argument described in the introduction, however, would suggest that skill should matter for people's readiness for both conscious and nonconscious goal pursuit. Regardless of whether a goal has been activated consciously or nonconsciously, people's attitudes toward relevant stimuli should reflect their average approach versus avoidance behaviors toward those stimuli. And, people who tend to increase their positivity toward stimuli that can help them with the currently most accessible goal (regardless of whether that goal was activated implicitly or explicitly) should, on average, be the most likely to approach those helpful stimuli, and thus, succeed at the goal. To address this question, I tested in the next experiment whether skill moderates people's evaluative readiness for a conscious goal. I also tested whether evaluative readiness emerges in explicit attitudes. Previous research (Ferguson & Bargh, 2004, Experiment 1; Sherman et al., 2003) has shown that conscious goals shift implicit, but not explicit, attitudes.

### Experiment 1b

This was a conceptual replication of the previous experiment, except that in this case, the goal was activated consciously, and the goal-relevant stimuli were presented supraliminally in the implicit attitude measure. Participants were asked to think about the importance of an academic achievement goal or not. Those in the control condition were asked to think about a social goal. Participants then completed a standard automatic attitude measure (e.g., Fazio et al., 1986) in which the stimuli consisted of stimuli that were either facilitative to the academic achievement goal or not.

### Method

*Participants.* Ninety undergraduates (56 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

*Materials.* Participants were asked to answer questions about their academic achievement concerns or their social lives. For example, those in the academic achievement condition were asked how important it is to do well academically, where they tend to study, how often they attend class, and how likely they think they will get a job after graduating. Those in the social goal condition were asked to consider how important it is to have good friends, how much they enjoy doing various activities with their friends, and how important it is to socialize. The questionnaires were given to participants in envelopes to ensure that the experimenter remained unaware of each participant's condition.

In the automatic attitude measure (see the *Procedure* section), the words *grades*, *books*, and *school* were selected as the goal-relevant stimuli. The control primes in the attitude measure (see below) included words similar to those in the previous experiment and were unrelated to either the academic or social goal. The target adjectives were the same as those used in Experiment 1a.

*Procedure.* On arrival to the lab, participants were given a questionnaire that asked them about either their academic achievement or social goal. They then completed a computer task that was described as a measure of how quickly and accurately one could make simple decisions about verbal stimuli. This task constituted the automatic attitude measure (e.g., Fazio, Jackson, Dunton, & Williams 1995; Ferguson, 2007; Ferguson & Bargh, 2004). Participants were told that they would see a pair of words on each trial and that they should evaluate the second word that appeared as quickly and as accurately as possible. Each trial consisted of a prime presented in the center of the screen for 150 ms, followed by a blank screen for 150 ms, followed by the target adjective. The target remained on the screen until the participant classified it as "GOOD" or "BAD" by pressing one of the correspondingly labeled keys. Each academic and control prime appeared twice with a positive target and twice with a negative target.

After the automatic attitude measure, participants completed a questionnaire in which they indicated their moods and their explicit attitudes toward the academic (*grades*, *books*, *school*) and neutral words using 11-point scales ranging from 1 (*very negative*) to 11 (*very positive*). They also completed various filler and demographic questions, including one about their GPA.

Participants were then given a comprehensive funneled debriefing questionnaire (Bargh & Chartrand, 2000) in which they were asked to speculate about the general purpose of the study and whether they noticed anything unusual in the computer task. They were asked whether they thought their responses to the targets in the computer task were influenced by the preceding words. They were then thoroughly debriefed, thanked for their participation, and dismissed.

### Results

None of the participants reported that the primes affected the speed of their responses to the target adjectives, and none of the participants guessed the hypothesis. One participant made excessive errors on the automatic attitude task (over 45%) and so was excluded from analyses.

*Automatic attitudes.* Analyses were conducted on correct responses only (the error rate was 3%). RTs that were faster than 250 ms and slower by more than three standard deviations from each individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses using untransformed means are reported. Automatic positivity for the academic and control primes was computed in the same way as in Experiment 1a.

The hypotheses were tested using multiple linear regression analyses, and all continuous predictors were centered. Automatic positivity toward the academic primes was regressed onto goal priming condition (academic achievement coded as 1, social coded as -1), academic skill (GPA), automatic positivity toward the control primes, and the interaction between goal priming and skill. Automatic positivity toward the control primes significantly predicted automatic positivity toward the academic primes ( $B = 0.48$ ,  $SE = .12$ ,  $t = 4.05$ ,  $p < .001$ ), such that the more positive participants' automatic attitudes toward the control primes, the more positive their attitudes toward the academic primes. As summarized in Table 2, the only other significant predictor was the expected interaction between the goal priming condition and skill ( $B = 79.69$ ,  $SE = 36$ ,  $t = 2.21$ ,  $p = .03$ ). To examine this interaction, a regression analysis was performed in each of the goal priming conditions. In each condition, automatic positivity toward the academic primes was regressed onto automatic positivity toward the control primes and skill. In the social goal condition, skill was not a significant predictor ( $p > .26$ ). However, in the academic priming condition, skill significantly predicted automatic attitudes toward the academic primes ( $B = 100.68$ ,  $SE = 44$ ,  $t = 2.25$ ,  $p = .03$ ). The interaction between goal priming and skill is graphically displayed in Figure 2 using skill scores one standard deviation above or below the grand mean.

Because participants in the academic achievement condition answered questions about their motivation for doing well in school, it was possible to include their reported motivation in a regression analysis in order to test whether skill predicts automatic attitudes in that condition above and beyond any predictive validity of explicitly reported motivation. In the priming questionnaire, participants answered two questions directly concerning their motivation ("In general, how important is it to you to do well in school?" and "On average, how important would you say it is for you to feel as though you are doing well here at school as a student?") along with various other questions (e.g., about where they tend to study, how often they go to class, and so forth). The

two motivation questions were highly correlated,  $r(38) = .64$ ,  $p < .001$ , and so were combined into a single motivation index. Then, for those primed with an academic achievement goal, automatic positivity toward the academic primes was regressed onto skill, automatic positivity toward the control primes, and motivation. Even with motivation entered, skill predicted automatic attitudes toward the academic primes ( $B = 123$ ,  $SE = 46$ ,  $t = 2.67$ ,  $p = .012$ ). Motivation was not a significant predictor ( $t < 1$ ).

I again tested whether the independent variables (goal condition and skill) predicted responses to targets that followed *goal* primes but not to targets that followed *control* primes. I again conducted a mixed-model analysis predicting the difference in RT to positive versus negative targets with goal condition, skill, and the type of prime that preceded the targets (goal vs. control prime) as the predictors. As expected, the three-way interaction between goal condition, skill, and type of prime was significant,  $F(1, 85) = 9.925$ ,  $p = .002$ . I also ran again a "reverse-order" regression predicting positivity toward the control primes, with all of the variables of interest, including positivity toward the goal primes, as predictors. Here though, unexpectedly, the two-way interaction between goal condition and skill was significant ( $B = -93$ ,  $SE = 26$ ,  $p = .002$ ). However, the interaction is primarily due to an effect in the control (i.e., social goal) condition rather than in the achievement goal condition. I ran a regression in each of the two goal conditions (achievement goal, social goal) to test whether skill predicted control-prime positivity. In the achievement goal condition, as would be predicted, skill did not predict control-prime positivity ( $p > .11$ ). However, in the social goal condition, skill did positively predict control-prime positivity ( $B = 105$ ,  $SE = 44$ ,  $p = .02$ ). It is difficult to interpret this unexpected effect in the control condition, but it did not emerge in any of the other experiments.

*Explicit attitudes.* Participants' explicit attitudes did not correlate with any of their automatic attitudes (all  $ps > .5$ ). Participants' explicit attitudes toward the three academic stimuli were averaged together and then regressed onto goal priming condition (academic achievement coded as 1, social coded as -1), academic skill, automatic positivity toward the control primes, and the interaction between goal priming and skill. No effects emerged (all  $ts < 1$ ).

*Mood.* Participants' negative mood ratings were subtracted from their positive mood ratings to create an overall explicit mood score. These scores were regressed onto goal priming condition, academic skill, automatic positivity toward the control primes, and the interaction between goal priming and skill. No significant effects emerged (all  $ps > .14$ ).

Table 2  
Summary of Multiple Linear Regression Analysis for Variables Predicting Automatic Positivity Toward Goal-Relevant Primes in Experiment 1b

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Goal condition	14.66	15.1	.10
Skill	34.22	34.9	.10
Automatic positivity toward control primes	0.48	0.12	.41*
Goal Condition $\times$ Skill	79.69	36.1	.23*

Note.  $R^2 = .20$ .

\*  $p < .05$ .

## Discussion

It appears that skill at a goal also moderates the effect of the *conscious* activation of that goal on evaluative readiness. Those who were skilled at academic achievement generated more positive automatic attitudes toward academic stimuli when they had been consciously primed with academic achievement versus not. Those who were least skilled, conversely, did not show this pattern of evaluation. These findings therefore go beyond earlier work (Ferguson & Bargh, 2004; Sherman et al., 2003) by identifying a moderator of evaluative readiness for conscious goal pursuit.

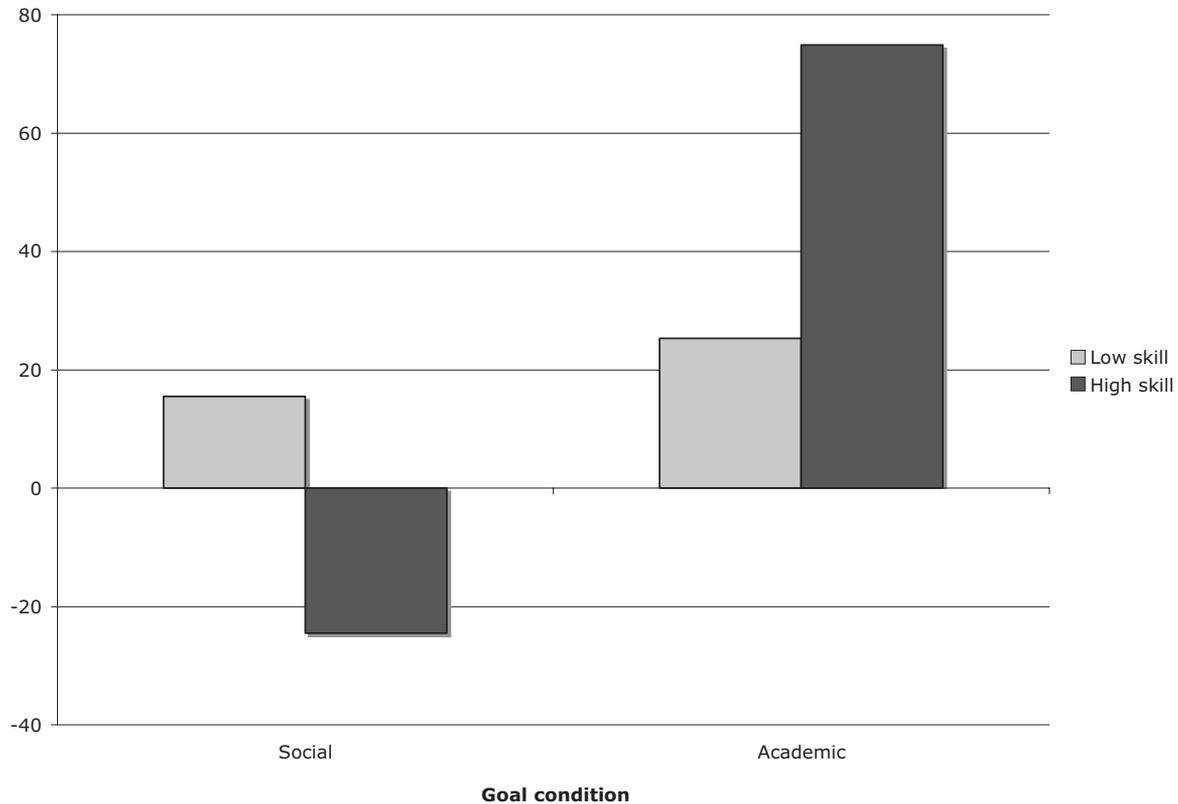


Figure 2. Automatic positivity toward academic stimuli as a function of priming condition and academic achievement skill.

Together with the previous experiment, the results suggest again that skilled people became evaluatively ready to pursue their goal only when it had been activated and not when a competing, important goal had been activated, or when no goal was activated. These findings indicate that although skilled people may bolster the accessibility and evaluation of the goal at which they are skilled when faced with a *clear* and *immediate* threat to that goal (e.g., Fishbach et al., 2003), they are not in fact chronically evaluatively ready to pursue that goal.

The present results also demonstrate that the effect of goals on attitudes may emerge most strongly for implicit rather than explicit attitudes. Participants' explicit attitudes toward the academic stimuli did not vary depending on the goal manipulation or their skill level. Given that the goal was fully conscious, why did it only influence participants' implicit, but not their explicit, attitudes? Multiple factors influence how people decide to report their explicit attitudes (e.g., Schwarz & Bohner, 2001). Although they may have been *consciously* ruminating about the goal, participants may have simply referred to other types of knowledge when asked to report their attitudes (see Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004). For instance, they may have been influenced by their own theories about the stability of their attitudes toward the goal-relevant stimuli. These data, along with consistent previous findings (see also Ferguson & Bargh, 2004; Sherman et al., 2003), tentatively suggest that goals may influence implicit attitudes more so than explicit ones (see also Ferguson & Bargh, 2007).

Possibly the most critical question over the last two experiments concerns the proposed motivational nature of the effects. I have argued that these effects result from the activation of a (conscious or nonconscious) goal. But, they could also be explained by a nonmotivational priming mechanism. For example, high-skill participants may possess more positive memories about academic stimuli when in an academic context, compared with low-skill participants. When nonconsciously primed with academic achievement, those with a high GPA evaluate *books* with more positivity, for instance. Thus, at this point, the theoretical postulation of a goal construct seems superfluous, and especially controversial for the experiment that relied on nonconscious goal priming.

What would indicate that a goal was in fact being activated? Research has shown that the activation of a goal leads to distinct behavioral effects compared with the activation of a nonmotivational construct (e.g., Aarts et al., 2004; Bargh et al., 2001; Fishbach & Ferguson, 2007; Förster & Liberman, 2007; Kawada, Oettingen, Gollwitzer, & Bargh, 2004; Shah & Kruglanski, 2003). Namely, whereas the strength of a goal stays the same or increases over a short amount of time (i.e., several minutes), the activation of a nonmotivational construct tends to decrease over that same time period (e.g., Atkinson & Birch, 1970; Gollwitzer & Moskowitz, 1996; Lewin, 1936; McClelland, Atkinson, Clark, & Lowell, 1953). In the next experiment, participants completed the attitude measure either immediately or 6 min after the goal priming task. If a goal is being activated, then the effect on automatic attitudes in

the delay condition should be the same as (e.g., Aarts et al., 2004; Lewin, 1936), or perhaps even larger than (e.g., Atkinson & Birch, 1970; Bargh et al., 2001; McClelland et al., 1953), that in the immediate condition. However, if only a nonmotivational (e.g., semantic) construct is being activated, then the effect should be weaker in the delay than in the immediate condition (see also Higgins, Bargh, & Lombardi, 1985; Srull & Wyer, 1979).

Another concern with the results over these last two experiments is that those with high or low skill may hold different beliefs about the utility and relevance of certain goal-relevant stimuli. For example, high-skill people may believe that books are more central to academic achievement than low-skill people. One way to preclude this possibility is to measure participants' automatic attitudes toward the goal itself rather than toward the assorted specific individual means for reaching it. This avoids any issue of participants possessing different beliefs about means according to skill level. And, automatic attitudes toward goals have been shown to predict goal-relevant behavior reliably (Ferguson, 2007).

So far, skill at academic achievement has been measured using the criterion of GPA. This is beneficial because GPA is an objective, validated measure of success. However, it also seems necessary to operationalize skill level in a more subjective way. After all, those who are successful at a goal should not just meet an objective criterion of success, but they should presumably also experience less difficulty and distress along the way compared with those who are not as successful. Skill was therefore operationalized in the next experiment as participants' reported difficulty with academic achievement.

In addition, all participants reported their motivation to achieve academically. In this way, I tested whether skill level predicts evaluative readiness even while controlling for explicitly reported motivation, in line with the findings from the previous experiment. Furthermore, including this item allows an examination of any effects of the implicit goal manipulation on participants' consciously reported motivation.

## Experiment 2

Participants first completed a word search puzzle used in previous research to activate the achievement goal in a nonconscious manner (Bargh et al., 2001). Participants then completed a subliminal automatic attitude measure either immediately or after a delay. They then completed a questionnaire with questions about their experienced ease of achieving as well as their motivation to achieve.

### Method

**Participants.** Ninety-four undergraduates (66 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

**Materials.** To covertly prime the achievement goal, participants completed a word search puzzle that contained words related to achievement or not (e.g., Bargh et al., 2001). In the goal condition, the puzzle included neutral words (e.g., *building, turtle, plant*) as well as the goal-relevant words *achieve, succeed, compete, master, strive, win, and attain*. In the control condition, the puzzle included the neutral words in the goal condition as well as other neutral words unrelated to the goal (e.g., *ranch, carpet, river*).

In the automatic attitude measure (see the *Procedure* section), the word *achievement* was selected to represent the academic achievement goal. The control primes in the attitude measure were unrelated to the goal and were similar to the control primes in previous experiments. The target adjectives were the same as those used in previous experiments.

**Procedure.** Participants arrived at the lab and were first asked to complete the word search puzzle. They were randomly assigned to receive either the goal or control puzzle, and the puzzle was given to each participant in an envelope to ensure that the experimenter remained unaware of the participant's condition. After participants finished the puzzle, they were randomly assigned to the immediate or delay condition. In the immediate condition, participants began the subliminal automatic attitude measure. In the delay condition, participants first worked on a map task for 6 min in which they were asked to draw a general map of the Ithaca area (they were told they did not need to provide much detail). After the map task, they began the attitude measure. In the attitude measure, the achievement prime was presented six times with positive targets and six times with negative targets. Each control prime was presented once with a positive target and once with a negative target. The instructions, timing, and other parameters of the subliminal attitude measure were identical to those from the previous experiment.

After the attitude measure, participants completed a questionnaire in which they were asked various demographic questions (e.g., age, gender, academic major). These questions included those about their experienced difficulty in achieving in the academic domain and their overall motivation to do well in that domain. Specifically, participants were asked to indicate using 11-point scales ranging from 1 (*not at all*) to 11 (*very much*) how difficult they find it to get high grades in their courses and also how difficult they find it to finish their coursework (see Fishbach et al., 2003). These items were meant to gauge participants' experienced success at achieving academically. In order to assess participants' motivation, they were asked to indicate how important it is to them to do well academically, using the same 11-point scale.

Participants were then given a comprehensive funneled debriefing questionnaire in which they were asked to speculate about the general purpose of the study and whether they saw anything unusual throughout the experiment. They were asked whether they noticed any themes relating the first puzzle task to the computer task and also whether they saw any words flash before the targets in the computer task. They were then thoroughly debriefed about the purpose of the experiment, thanked for their participation, and dismissed.

### Results

None of the participants reported seeing any words flashed in the computer task, nor did anyone guess the hypotheses. One participant was excluded for excessive error rates.

Analyses were conducted on correct responses only (the error rate was 3%). RTs that were faster than 250 ms or slower than three standard deviations above an individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses using untransformed means are reported.

Automatic positivity toward the goal and control primes was computed in the same way as in previous experiments.

The two items assessing skill at the academic goal were reverse coded so that higher numbers reflect greater skill. These two items were correlated,  $r(93) = .72, p < .001$ , and so were combined into a single skill index. After all continuous predictors were centered, automatic positivity toward the goal primes was regressed onto goal priming condition (the achievement condition was coded as 1, the control condition was coded as  $-1$ ); timing condition (immediate condition coded as  $-1$ , delay condition coded as 1); academic skill; automatic positivity toward the control primes; the interaction between goal priming and skill; the interaction between goal priming and timing; the interaction between skill and timing; and the interaction between goal priming, skill, and timing. As shown in Table 3, automatic positivity toward the control primes significantly predicted automatic positivity toward the goal primes ( $B = 0.32, SE = .09, t = 3.55, p < .001$ ) such that the more positive participants' automatic attitudes toward the control primes, the more positive their attitudes toward the goal primes. Skill also marginally significantly predicted automatic positivity toward the goal primes ( $B = 8.12, SE = 4.45, t = 1.82, p = .072$ ), such that the more skill participants reported, the more positive their attitudes toward the goal primes. Finally, the predicted three-way interaction between goal priming, skill, and timing approached significance ( $B = 8.51, SE = 4.45, t = 1.91, p = .059$ ).

To examine this interaction, a regression analysis was conducted in each of the two timing conditions. In each timing condition, automatic positivity toward the goal primes was regressed onto goal priming condition, academic skill, automatic positivity toward the control primes, and the interaction between goal priming and skill. In the immediate condition, the only significant predictor was automatic positivity toward the control primes ( $B = 0.44, SE = .11, t = 4.07, p < .001$ ). In the delay condition, skill was a significant predictor ( $B = 14.56, SE = 6.69, t = 2.17, p = .036$ ). In addition, the interaction between goal priming and skill was significant ( $B = 13.97, SE = 6.67, t = 2.09, p = .043$ ). To examine this interaction, a regression was conducted in each of the "goal-delay" and

"control-delay" conditions. In the control-delay condition, skill did not predict automatic positivity toward the goal primes ( $t < 1$ ). In the goal-delay condition, however, skill was a significant predictor ( $B = 28.74, SE = 11, t = 2.55, p = .03$ ). I also conducted a regression analysis in each of the four conditions (resulting from the goal priming and timing factors) with explicit motivation included as a predictor. It was not significant in any of the four conditions, and, in the goal-delay condition, skill remained significant ( $p < .03$ ) even when motivation was included in the analysis. The interaction between goal priming and skill for the immediate condition is graphically displayed in Figure 3 using skill scores either one standard deviation above or below the grand mean. The interaction between goal priming and skill for those in the delay condition is illustrated in Figure 4.

I again ran a mixed-model analysis in order to ensure that the independent variables predicted only RTs to targets that followed goal primes and not RTs to targets that followed control primes. The four-way interaction between goal condition, skill, timing condition, and type of prime (goal, control) trended toward significance,  $F(1, 85) = 2.47, p = .12$ . I also ran a "reverse-order" regression analysis predicting positivity toward the control primes, with all the same independent variables, as well as positivity toward the goal primes as predictors. As expected, the three-way interaction between goal condition, timing condition, and skill was not significant ( $t = -0.8, p > .4$ ) when predicting positivity toward control primes.

Finally, participants' reported motivation was entered into a univariate analysis of variance with goal condition and timing condition as the factors. There was no effect of the goal or the interaction between goal and timing ( $F_s < 1$ ).

## Discussion

These findings show again that the implicit activation of a goal leads to the evaluative readiness to pursue the goal. Those skilled at the goal were also again the most likely to show evaluative readiness. Moreover, these effects did not decay after 6 min and instead *increased* in strength, suggesting that the effect is due to the activation of a goal rather than to a nonmotivational construct. As has been found in previous studies in which the nonconscious activation of the achievement goal was examined, downstream effects of the goal became stronger, rather than weaker, over time (e.g., Bargh et al., 2001). Additionally, further evidence of the nonconscious nature of the goal is suggested by the lack of any effects on participants' consciously reported motivation.

These findings also go beyond the objective criterion of skill (GPA) used in the previous experiments by showing the importance of skill as operationalized in a more subjective manner. And, these results revealed that skill predicted evaluative readiness even while controlling for participants' explicitly reported motivation. Although self-reported motivation may be a poor indication of "actual" motivation (e.g., Wilson, 2002; Wilson & Dunn, 2004), this finding preliminarily suggests that one's motivational desire to reach a goal may be a necessary but not sufficient prerequisite for developing evaluative readiness for that goal. It appears that people have to be somewhat skilled at the goal in order to show a

Table 3  
Summary of Multiple Linear Regression Analysis for Variables Predicting Automatic Positivity Toward Goal-Relevant Primes in Experiment 2

Variable	B	SE B	$\beta$
Goal condition	13.08	10.7	.12
Timing condition	4.3	10.6	.04
Skill	8.12	4.5	.18
Automatic positivity toward control primes	0.32	0.09	.34*
Goal Condition $\times$ Timing Condition	2.78	10.6	.03
Timing Condition $\times$ Skill	5.53	4.5	.12
Goal Condition $\times$ Skill	5.99	4.5	.13
Goal $\times$ Timing $\times$ Skill	8.51	4.44	.19 <sup>†</sup>

Note.  $R^2 = .25$ .

\*  $p < .05$ . <sup>†</sup>  $p < .06$ .

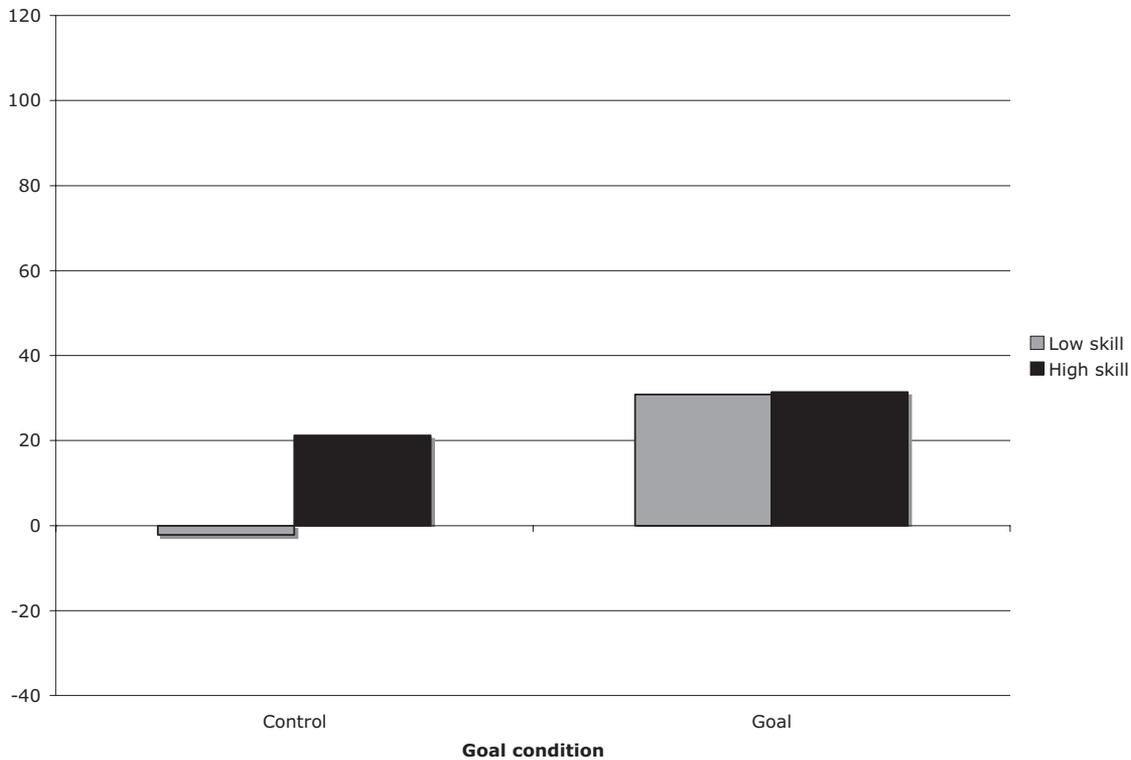


Figure 3. Automatic positivity toward achievement as a function of priming condition and academic achievement skill in the immediate condition.

nonconscious evaluative readiness to pursue it whenever it becomes active.<sup>6</sup>

Previous research showed that goals influence automatic attitudes toward both abstract as well as concrete stimuli (Ferguson & Bargh, 2004). For example, whereas the activation of the thirst goal led to more positive automatic attitudes toward *water* and *juice* in one experiment, the activation of the athleticism goal led to more positive automatic attitudes toward *agile* and *fast* in another experiment. The present results are consistent with this finding and show that once a goal has been activated, those who are skilled at the goal automatically evaluate both abstract and concrete stimuli that are relevant to that goal as more positive.

In this experiment, there was no effect of the goal manipulation in the immediate condition. This differs from the previous two experiments in which there was an effect even though no delay was instituted. What might underlie this difference? In the previous experiment, participants were conscious of the goal and were prompted to think explicitly about various strategies to attain it. In such a case, it seems reasonable to expect that this kind of intentional thinking would quickly influence people's evaluations of those strategies and relevant stimuli. However, when a goal has been activated nonconsciously, or at least with minimal conscious involvement and guidance, the effect of the goal on automatic attitudes may take some time to emerge. If the strength of the goal increases over time, then it should be weakest immediately after the goal manipulation (unlike semantic priming effects). This may explain why the effect did not emerge in the immediate condition in the present experiment. But why did it emerge in what was

effectively the immediate condition in Experiment 1a? It turns out that a difference in the length of the goal manipulations in each case may explain this discrepancy. The goal induction in Experiment 1a (the scrambled sentences task) seemed to take longer for participants to complete than the goal induction in the present experiment (the crossword puzzle). This would mean that more time elapsed between the goal activation and the attitude measure in Experiment 1a versus in the present experiment. To examine this, a pilot study was conducted. Participants required over 7 min to complete the scrambled sentence task used in Experiment 1a ( $M = 7.08$  min) versus just over 2.5 min to complete the same puzzle task used in the present experiment ( $M = 2.62$  min). This difference was significant,  $t(45) = -8.2, p < .001$ . This is suggestive that the effect of an implicit goal on attitudes may require some initial time to develop and is not necessarily instantaneous. This is in accord with recent evidence that the effect of goal activation on related knowledge accessibility is not instantaneous but takes some (brief) time to emerge (see also Förster et al., 2005).

One concern over the last experiments is that although the two goal priming methods (i.e., scrambled sentences and word search puzzle) used in Experiment 1a and Experiment 2 have been shown to be implicit in previous research, there is always the possibility

<sup>6</sup> I think motivation is a *necessary* requisite for evaluative readiness on the basis of the assumption that one must be motivated to some extent to reach a certain goal in order to become skilled at that goal.

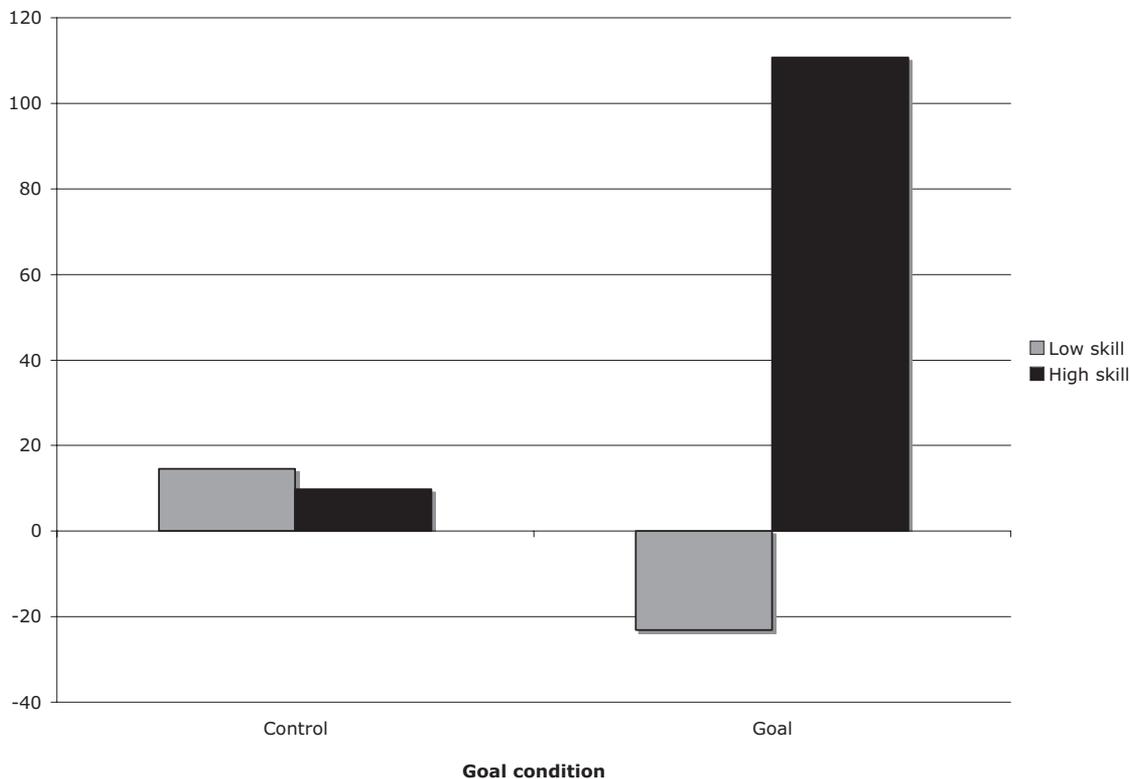


Figure 4. Automatic positivity toward achievement as a function of priming condition and academic achievement skill in the delay condition.

that consciously seeing the individual goal-relevant words in the scrambled sentence task (Experiment 1a) or the word search puzzle (Experiment 2) may have led participants to think consciously about the respective goals. It should be reiterated that none of the participants mentioned any goal-related thoughts in the detailed debriefing, and there were no effects of the implicit goal manipulation on their consciously reported motivation (in Experiment 2). Nevertheless, it seems wise to move to an even more covert method of goal activation in the next experiment: subliminal priming. Additionally, another concern over the past three experiments is whether this set of results is specific to academic achievement. In order to ensure that the central predictions generalize beyond the academic achievement goal, the next experiment addressed the goal to be thin.

### Experiment 3

Participants were subliminally primed with words related to the goal of being thin or not. They then completed a subliminal automatic attitude measure either immediately or after 6 min. If a goal is being activated, then any effect should stay the same (Aarts et al., 2004), or even increase (Bargh et al., 2001), across a short time period. In the automatic-attitude task, participants evaluated words that were related to the thin goal or not. They were also asked to report their skill level at the goal as well as their motivation for the goal.

### Method

**Participants.** One hundred eight undergraduates (64 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

**Materials.** In the subliminal priming paradigm, the goal primes consisted of the words *thin* and *small*. The control stimulus was *mswr*. In the attitude measure, the words *vegetables*, *salad*, and *gym* were selected as the goal-relevant words. The control primes in the attitude measure were unrelated to the thin goal and were similar to the control primes in previous experiments. The target adjectives were the same as those used in previous experiments.

**Procedure.** Participants arrived at the lab and were first asked to complete a computer task on “language processing.” Participants were asked to indicate whether each of a series of target stimuli was a word or nonword (i.e., nonsense string of characters). All of the words were neutral and unrelated to the thin goal. In each trial, a thin or control prime was presented for 17 ms and was followed (masked) immediately with either a word or a nonword target. After the participant pressed the *word* or *nonword* key, a 2,000-ms intertrial interval (ITI) began. There were 60 trials, 30 of which contained word targets, and 30 of which contained nonword targets. In the goal condition, the goal primes preceded all of the 30 word targets. In the control condition, the nonsense prime preceded the 30 word trials. In both the goal and control conditions, the nonsense prime preceded all of the nonword targets. It

should be noted that participants typically take longer than 3 min to complete this computer task, which presumably will allow enough time for the goal to influence automatic attitudes even in the immediate condition.

In a separate pilot study to test the visibility of the primes in this goal priming paradigm, participants received the goal priming version of the above paradigm, and so received 30 trials that contained a goal prime (15 trials with *small*, 15 trials with *thin*). However, in this pilot study, participants were told that a subliminal prime was being presented in each trial. Because this paradigm contained only two actual primes (each repeated many times), participants were asked to report after each prime presentation any word they saw. Participants, on average, accurately detected the prime in less than 2% of all the trials. More specifically, 76% of participants ( $n = 19$ ) did not accurately detect any prime across the trials. An additional 12% ( $n = 3$ ) were able to detect one prime across the 30 trials. This means that the majority of participants were unable to detect even one prime, and a full 88% of participants saw either nothing or only a single prime over the 30 trials. Out of the remaining 3 participants, 2 detected two primes, and 1 detected four primes. Considering that participants in this pilot study both were told to look for a subliminal word and did not have to complete any other task (unlike in the real experiment), these data suggest that participants' conscious awareness of the primes was either precluded or largely minimized in the actual experiment.

After the "language" task, participants completed the attitude measure. The instructions, timing, and other parameters of the attitude measure were identical to previous experiments. A separate pilot study was conducted to test the visibility of the primes in this attitude paradigm (see also Olson & Fazio, 2002) using the prime and target stimuli from the present experiment. Participants in the pilot study were told that a prime had been presented to them subliminally within each trial and were asked to select those primes from a list of words (half of which were the actual primes). Participants' number of false alarms (incorrectly selecting foils) was subtracted from their number of hits (correctly selecting a prime). Just as Olson and Fazio (2002) found, this index was not significantly different from zero,  $t(30) = -0.76$ ,  $p = .45$  ( $M = -0.25$ ), suggesting that participants' awareness of the primes during this attitude measure was precluded or largely minimized in both this experiment as well as in the previous and subsequent ones.

Participants completed the attitude measure immediately after the goal priming task or after a delay of 6 min, during which they were asked to sketch a map as a filler task. Participants then completed a questionnaire in which they were asked various filler questions, including questions about their typical behaviors. Given considerable research suggesting that dieting, or restrained eating, is diagnostic of having the goal to become or stay thin (e.g., McFarlane, Polivy, & Herman, 1998), participants were first asked whether they diet ("Do you try to avoid eating tempting and fattening foods?"). Although dieting is common in college samples (e.g., Fishbach & Shah, 2006), this item was included to make certain that the thinness goal would be relevant for all participants. This ensured that any participants who reported little difficulty in dieting and trying to be thin would actually be skilled, rather than uninterested, in the goal itself.

To assess skill at the goal to be (or stay) thin, participants were asked on 11-point scales how difficult they found it to become or stay thin, and also how difficult they found it to resist eating tempting or fattening foods (for both questions, 1 = *not at all*, and 11 = *very much*). They were also asked, using the same 11-point scale, the degree to which it is important to them to diet. A portion of participants were also asked, at the end of the questionnaire, to indicate, using 10-point scales, how helpful and relevant *gym*, *salad*, and *vegetables* are for the goal of being thin (for both the helpful and relevant scales, 1 = *not at all*, 10 = *very much*).

Participants were given a comprehensive funneled debriefing questionnaire in which they were asked about the purpose of the study and whether they saw anything unusual in either of the two computer tasks. They were then asked specifically whether they saw any words flash during either of the two computer tasks. They were then thoroughly debriefed, thanked, and dismissed.

## Results

None of the participants reported seeing any words flash in either of the two computer tasks, nor did anyone guess the hypotheses of the study. Participants who indicated that they never restrain their eating were assumed to not possess the dieting goal and thus were excluded from analyses (16 participants, or 14.8% of total). Three participants were excluded for not following instructions, and 2 participants were excluded for making an excessive number of errors (over .40).

Analyses were conducted on correct responses only (the error rate was 4%). RTs that were faster than 250 ms or slower than three standard deviations above an individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses using untransformed means are reported. Automatic positivity toward the goal-relevant and control primes was computed in the same way as in previous experiments.

The two items assessing skill at the thin goal were reverse coded so that higher numbers reflect greater skill. These two items were correlated,  $r(87) = .42$ ,  $p < .001$ , and so were combined into a single skill index. All continuous predictors were then centered. Automatic positivity toward the goal primes was regressed onto goal condition (control condition coded as  $-1$ , goal condition coded as  $1$ ); timing condition (immediate condition coded as  $-1$ , delay condition coded as  $1$ ); skill; automatic positivity toward the control primes; the interaction between goal condition and skill; the interaction between goal condition and timing; the interaction between timing and skill; and the interaction between goal condition, skill, and timing. Automatic positivity toward the control primes was a significant predictor ( $B = 0.36$ ,  $SE = .17$ ,  $t = 2.11$ ,  $p = .038$ ). As summarized in Table 4, and in line with the hypothesis, the interaction between goal condition and skill was the only other significant predictor ( $B = 13.56$ ,  $SE = 6.6$ ,  $t = 2.05$ ,  $p = .04$ ) and was not qualified by timing condition. To examine this interaction, a regression analysis was performed in each of the two goal conditions. Specifically, automatic positivity toward goal primes was regressed onto skill and automatic positivity toward control primes. In the control condition, neither predictor was significant (both  $ps > .3$ ). In the goal condition, automatic posi-

Table 4  
Summary of Multiple Linear Regression Analysis for Variables Predicting Automatic Positivity Toward Goal-Relevant Primes in Experiment 3

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Goal condition	-13.47	14.0	-.11
Timing condition	-18.11	13.8	-.14
Skill	8.23	6.8	.16
Automatic positivity toward control primes	0.36	0.17	.23*
Goal Condition $\times$ Timing Condition	3.46	14.0	.03
Timing Condition $\times$ Skill	1.95	6.9	.04
Goal Condition $\times$ Skill	13.56	6.6	.26*
Goal $\times$ Timing $\times$ Skill	-9.68	6.6	-.18

Note.  $R^2 = .18$ .

\*  $p < .05$ .

tivity toward control primes was significant ( $B = 0.51$ ,  $SE = .21$ ,  $t = 2.42$ ,  $p = .02$ ). And, as predicted, skill was also significant ( $B = 17.24$ ,  $SE = 7.6$ ,  $t = 2.27$ ,  $p = .029$ ). The interaction between goal condition and skill is graphically displayed in Figure 5 using skills scores one standard deviation above or below the mean. I also performed a regression analysis in each goal condition, adding motivation as a predictor, along with skill and automatic positivity toward control primes. In the control condition, none of the three predictors was significant. In the goal condition, whereas motiva-

tion was not significant ( $t < 1$ ), skill remained a significant predictor ( $B = 19.74$ ,  $SE = 8.9$ ,  $t = 2.22$ ,  $p = .03$ ).

One critical question is whether those with high skill find the goal-relevant items (gym, salad, vegetables) as more relevant or helpful for the goal of being thin than do the low-skill participants. To test this possibility, some participants ( $n = 17$ ) from the present experiment were asked to report their beliefs about the helpfulness and relevance of each of the three goal-relevant items for the goal to be thin. On average, the items were rated as highly relevant ( $M = 8.1$ ,  $SD = 1.2$ ) and highly helpful ( $M = 7.57$ ,  $SD = 1.3$ ) for the goal (and no differences across prime conditions,  $t_s < 1$ ). More importantly, there were no correlations between skill and any of the helpful or relevant ratings for any of the three items (and no differences across prime conditions).

I again conducted a mixed-model analysis, predicting a difference in RT to the positive versus negative targets as a function of goal condition, skill, timing condition, and the type of prime (goal vs. control). I expected that the interaction between goal condition and skill described above would be further dependent on the *type of prime* preceding the targets, and this was the case,  $F(1, 79) = 3.69$ ,  $p = .058$ . Furthermore, in the "reverse-order" regression analysis predicting positivity toward the control primes, the interaction between goal condition and skill was not significant, as expected ( $t = -.512$ ,  $p > .6$ ).

Finally, I entered participants' consciously reported motivation into an ANOVA with goal condition and timing condition as the factors. There was no main effect of the goal and no interaction between goal and timing (both  $F_s < 1$ ).

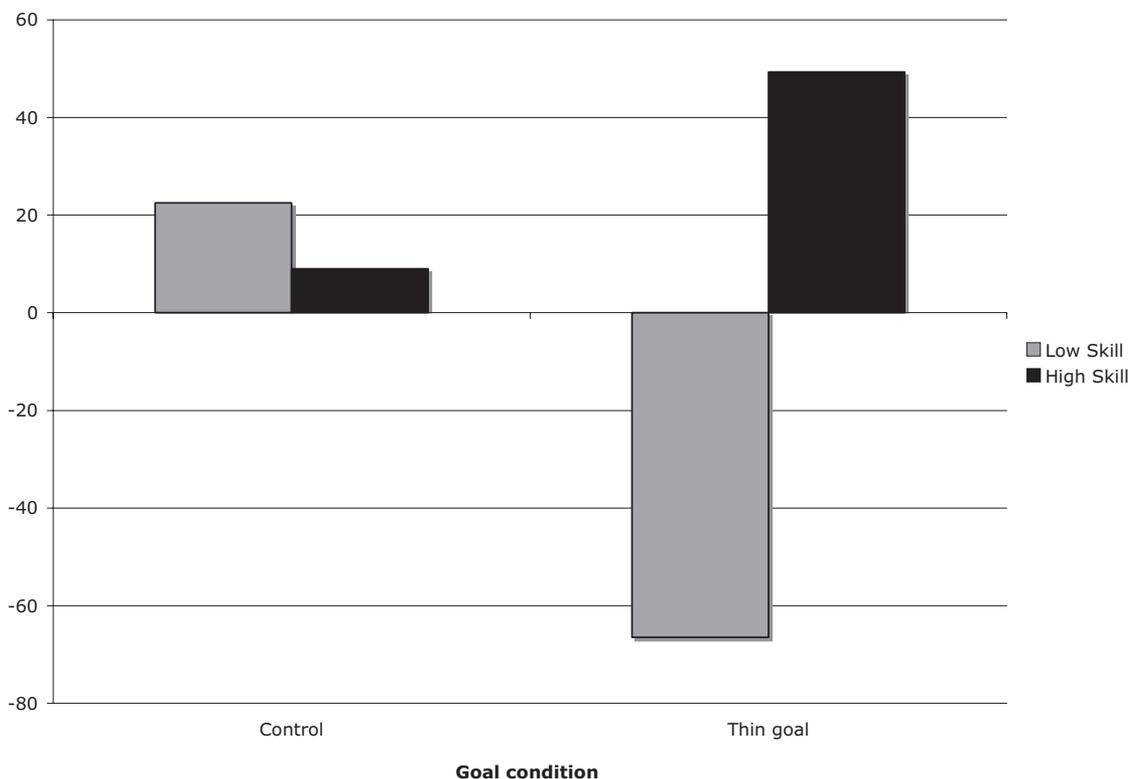


Figure 5. Automatic positivity toward diet-relevant primes as a function of priming condition and skill.

## Discussion

The findings show again that the nonconscious activation of a goal led to an evaluative readiness to pursue the goal. When the thin goal was nonconsciously activated (vs. not), those skilled at the goal generated more positive automatic attitudes toward the goal-relevant stimuli. This occurred even though participants could not consciously detect the goal-relevant stimuli. More importantly, the effect of the goal held over both the immediate and delay conditions, again suggesting that a motivational construct was responsible for the effects (see, e.g., Aarts et al., 2004; Bargh et al., 2001). Additionally, again there was no effect of the implicit goal manipulation on participants' consciously reported motivation.

The findings also suggest that high-skill participants did not differ from low-skill participants in terms of their explicit beliefs about the goal relevance and utility of the goal-relevant stimuli. And yet, only highly skilled participants became implicitly evaluatively ready to approach those objects when the goal became activated. These results suggest that evaluative readiness is an *implicit signature* of effective goal pursuit and can be easily and effortlessly triggered with little conscious awareness.

Across the last two experiments, the strength of the effects of the nonconscious goal activation on participants' automatic attitudes either increased or stayed the same over 6 min. In Experiment 2, the strength of the effects increased over time, rather than decreased, and this is one of the hallmarks of goal activation (e.g., Atkinson & Birch, 1970; Bargh et al., 2001; Birch, Atkinson, & Bongert, 1975; McClelland et al., 1953). There is no theory of nonmotivational priming effects that would predict such an increase over time without additional stimulation. In Experiment 3, the strength of the effect stayed the same over time, rather than decreased. This persistence of activation over time also suggests that a goal was being activated, given that semantic priming effects tend to decay within minutes (e.g., Higgins, 1996; Wilson & Capitman, 1982; Wyer & Srull, 1986; see also Aarts et al., 2004; Lewin, 1936). Moreover, the persistence of the activation in memory of a motivated *intention*, versus mere semantic or lexical priming, over a period of minutes has also been shown by research on intentional memory (Marsh, Hicks, & Bink, 1998; Marsh, Hicks, & Bryan, 1999; Maylor, Darby, & Della Sala, 2000). These findings together suggest that the effects on attitudes are due to the activation of a goal per se. However, in order to bolster this argument further, in the next experiment I sought additional evidence of a motivational explanation for the effects.

## Experiment 4

Over the last experiments, participants' explicitly reported motivation for the goal did not influence the findings. The goal manipulation did not change people's explicitly reported motivation for the goal, nor did participants' explicitly reported motivation qualify the effect of the goal manipulation on their implicit attitudes. On the one hand, this lack of an effect for explicitly reported motivation adds credence to the argument that the goal activation is nonconscious. It also suggests that people's explicitly reported motivation for a goal may not be a highly accurate index for the *actual* importance of that goal (see also Ferguson, 2007; Wilson, 2002; Wilson & Dunn, 2004). In other words, it may not predict the effect of the goal on people's goal-relevant judgments and behaviors.

However, on the other hand, the fact that people's explicitly reported motivation for the goal does not seem to play any significant role in the effects so far may raise some suspicion about whether goals are really being activated in these experiments. After all, should not the influence of a primed goal on attitudes depend to some extent on the importance or relevance of the goal to the person? Would any nonconscious goal trigger an evaluative readiness to pursue it?<sup>7</sup> In fact, recent research suggests that the answer may be no. Nonconscious goals that are socially undesirable do not influence participants' goal-relevant behavior (Aarts et al., 2004). This suggests that the importance or relevance of the goal does matter in terms of influencing people's downstream attitudes, judgments, and behavior. It just may be that people's explicitly reported motivation for the goal is at times a poor proxy for the actual importance of the goal (Ferguson, 2007; Wilson & Dunn, 2004). Critically, this may be especially true for goals that are, on average, highly desirable and important, such as the ones I have examined so far in the present article (e.g., academic achievement, being thin).<sup>8</sup> Thus, it would be preferable to be able to gauge the importance of a goal without relying on people's explicitly reported assessments of the desirability of the goal. And, it would be preferable to use such information to show that a goal's importance or relevance qualifies the effect of the goal on people's implicit attitudes. That is, the nonconscious effect of a goal on a person's evaluative readiness should be the strongest when the goal is currently highly relevant versus when it is not at all relevant.

Demonstrating that the current relevance, or importance, of a goal for a person does moderate its effect on that person's evaluative readiness would accomplish two things. First, it would show that the relevance of the goal to the person does matter and is a moderator of the effect of nonconscious goals on implicit attitudes. This would be in line with recent research on implicit goals (Aarts et al., 2004). Second, it would provide additional support for the argument that a goal, rather than a semantic construct, for instance, is responsible for the effect on attitudes.

In this experiment, I nonconsciously primed participants with the goal to eat or did not. I then measured their nonconscious attitudes toward food-relevant versus control stimuli. In order to gauge the current relevance of the goal to participants, I asked them at the end of the experiment how many hours ago they consumed their last meal. On the face of it, asking participants how many hours and minutes have passed since their last meal should be relatively objective and should also indicate how important and

<sup>7</sup> The findings already demonstrate that for relatively difficult goals, those who are skilled at the goal are most likely to show evaluative readiness for the goal whenever it is activated. However, being skilled at a goal presupposes some motivation to achieve the goal. The question here is whether it makes sense for people who are not motivated to achieve a goal to nevertheless become evaluative ready to pursue it once it has been primed.

<sup>8</sup> It is unquestionably the case that people's explicitly reported motivation for a goal can at times strongly predict their attitudes, judgments, and behavior. However, people's reported motivation for a goal might be less predictive for goals that are almost invariably highly desirable. Additionally, people's explicitly reported motivation for a goal may predict some kinds of judgments and behaviors related to the goal but not others (see Ferguson, 2007).

relevant the goal to eat is to them at that moment. For those who are primed with the goal, they should show positive attitudes toward the food stimuli depending on when they last ate. Those who have just eaten should show the weakest effect, whereas those who have not eaten in a while should show the strongest effect.

### Method

**Participants.** One hundred and seven undergraduates (78 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

**Materials.** In the subliminal goal priming paradigm, the goal primes consisted of the words *eat*, *taste*, and *hungry*. The control stimulus was *zxcvbnm*. In the attitude measure, the words *food* and *snacks* were used as the goal-relevant words. The control primes in the attitude measure were unrelated to the eating goal and were similar to the control primes in previous experiments. The target adjectives were the same as those used in previous experiments.

**Procedure.** Participants arrived at the lab and were first asked to complete a computer task in which they had to simply indicate whether they liked a novel object or not. They were randomly assigned to the goal or control condition. In each trial of the task, a mask (a novel shape) first appeared for 153 ms. Then, either a goal prime or nonsense prime (depending on condition) appeared for 28 ms. The same mask then appeared for 97 ms. A different novel bitmap image then appeared, and participants were asked whether they liked it (yes or no). The ITI was 1,000 ms, and there were 30 trials. In the goal condition, each of the goal primes was presented 10 times. In the control condition, the nonsense prime was presented 30 times.

After participants finished the computer task, they were given a 30-s break and were then asked a series of questions about the previous task (e.g., “How many images do you think you judged?” “Did you see any images with dots in it?” “Did you use any particular strategy for the task?”). These questions were used as fillers and were meant to allow time to pass before participants completed the attitude measure. In the attitude measure, the *food* and *snacks* primes were each presented two times with positive targets and two times with negative targets. Each control prime was presented once with a positive target and once with a negative target. The instructions, timing, and other parameters of the subliminal attitude measure were identical to those from the previous experiments.

After participants were finished, they answered some demographic questions. Included in these questions was one about when they had last eaten a meal. They were asked to enter into the computer the number of hours and minutes since their last meal. They were also asked to indicate how thirsty and hungry they were on 9-point scales ranging from 1 (*not at all*) to 9 (*very much*). They were then asked questions about the current experiment, including the purpose of the experiment and whether they found anything unusual or unexpected about any part of the experiment. Participants were also asked whether they saw any real words in the initial “image” task, whether they saw any real words appear during the attitude measure, and whether they felt like any of the components of the experiment were related to one another. They were then fully debriefed and thanked for their participation.

### Results

One participant did not answer the question about the time since her last meal, 2 of the participants reported seeing words flashed in the image computer task, and 5 participants had error rates of over 30% on the attitude measure. These participants were excluded from analyses. None of the participants guessed the hypotheses.

The distribution of the number of hours and minutes since participants' last meal was skewed, and so this variable was log transformed. Participants had eaten their last meal on average about 3.69 hr before the experiment ( $SD = 4.2$ ), and this did not differ by goal condition (according to the log-transformed variable,  $p > .28$ ).

The analyses of the RT data were conducted on correct responses only (the error rate was 3%). RTs that were faster than 250 ms or slower than three standard deviations above an individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses in which untransformed means were used are reported. Automatic positivity toward the goal and control primes was computed in the same way as in previous experiments.

Automatic positivity toward the goal primes was regressed onto goal condition (control condition coded as  $-1$ , goal condition coded as  $1$ ), automatic positivity toward the control primes, time since their last meal, and the interaction between goal condition and time since their last meal. Automatic positivity toward the control primes was a predictor that approached significance ( $B = .26$ ,  $SE = .14$ ,  $t = 1.8$ ,  $p = .075$ ). Time since their last meal was a significant predictor ( $B = 20.25$ ,  $SE = 10.2$ ,  $t = 1.98$ ,  $p = .05$ ). As summarized in Table 5, and in line with the hypothesis, the interaction between goal condition and time since their last meal was also a significant predictor ( $B = 30.40$ ,  $SE = 10.2$ ,  $t = 2.98$ ,  $p < .005$ ). To examine this interaction, a regression analysis was performed in each of the two goal conditions. Specifically, automatic positivity toward goal primes was regressed onto time since their last meal and automatic positivity toward control primes. In the control condition, neither predictor was significant (both  $ps > .4$ ). In the goal condition, automatic positivity toward control primes was significant ( $B = .46$ ,  $SE = .22$ ,  $t = 2.08$ ,  $p < .05$ ). And, as predicted, time since their last meal was also significant ( $B = 52.22$ ,  $SE = 15.67$ ,  $t = 3.33$ ,  $p < .003$ ). The interaction between goal condition and time since their last meal is graphically displayed in Figure 6, using time-since-last meal scores one standard deviation above or below the mean.<sup>9</sup>

I then performed a regression analysis in each goal condition, adding their self-reported hunger as a predictor, along with time since their last meal and automatic positivity toward control primes. In the control condition, none of the three predictors was significant (all  $ps > .4$ ). In the goal condition, whereas reported hunger was not significant ( $t < 1$ ), time since their last meal remained a significant predictor ( $B = 49.42$ ,  $SE = 17.96$ ,  $t = 2.7$ ,  $p < .01$ ). Also, participants' explicitly reported hunger was not influenced by the goal manipulation. There was no significant

<sup>9</sup> Among participants who had recently eaten a meal, those who were primed with the goal (vs. not) did not show significantly more negative attitudes toward the food-relevant primes ( $p > .3$ ).

Table 5  
Summary of Multiple Linear Regression Analysis for Variables Predicting Automatic Positivity Toward Goal-Relevant Primes in Experiment 4

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Goal condition	2.1	11	-.02
Automatic positivity toward control primes	0.26	0.14	.18**
Time since last meal	20.25	10.21	.19*
Goal $\times$ Time Since Last Meal	30.39	10.19	.29*

Note.  $R^2 = .145$ .

\*  $p < .05$ . \*\*  $p < .10$ .

difference in reported hunger for those in the goal ( $M = 3.83$ ) versus control ( $M = 4.18$ ) conditions ( $t < 1$ ).

I also conducted a “reverse-order” regression analysis in which I regressed automatic positivity toward the control primes onto the variables of goal condition, time since their last meal, automatic positivity toward the goal primes, and an interaction between goal condition and time since their last meal. Neither the predictor of time since their last meal nor the interaction term between goal condition and time since their last meal was significant ( $ps > .32$ ), as expected. This ensured that the interaction between goal condition and time since their last meal predicted automatic positivity toward the goal primes but not toward the control primes.

### Discussion

In this experiment, and in the previous two experiments, participants’ explicitly reported motivation for the goal was not influenced by the goal manipulation, nor qualified the effect of the goal on participants’ implicit attitudes. In this case, participants’ explicitly reported hunger did not qualify the effect of the nonconscious eating goal on participants’ implicit positivity toward food stimuli. And, their reported hunger was not influenced by the goal manipulation. This indicates that nonconscious goal activation may not influence people’s conscious assessments of the importance of the goal, and may instead operate more subtly on behavior (see also Aarts et al., 2004). Additionally, it suggests that people’s explicitly reported motivation for a goal may not be an accurate index for the actual importance of the goal to the person, perhaps especially for goals that are usually chronically desirable. When people are reporting the desirability of a goal, they may refer to their *theories* about the importance of the goal, which may at times be mistaken or imprecise (e.g., Wilson, 2002).

However, the fact that people’s *explicitly reported* motivation for a goal does not seem to play a role here does not mean that the current importance of a goal does not matter. When using an arguably less subjective index of the importance of the eating goal (i.e., how much time had passed since their last meal), the present results showed that the effect of a nonconscious goal to eat on implicit attitudes depended on the current relevance of the eating goal. For those in the goal condition (but not for those in the

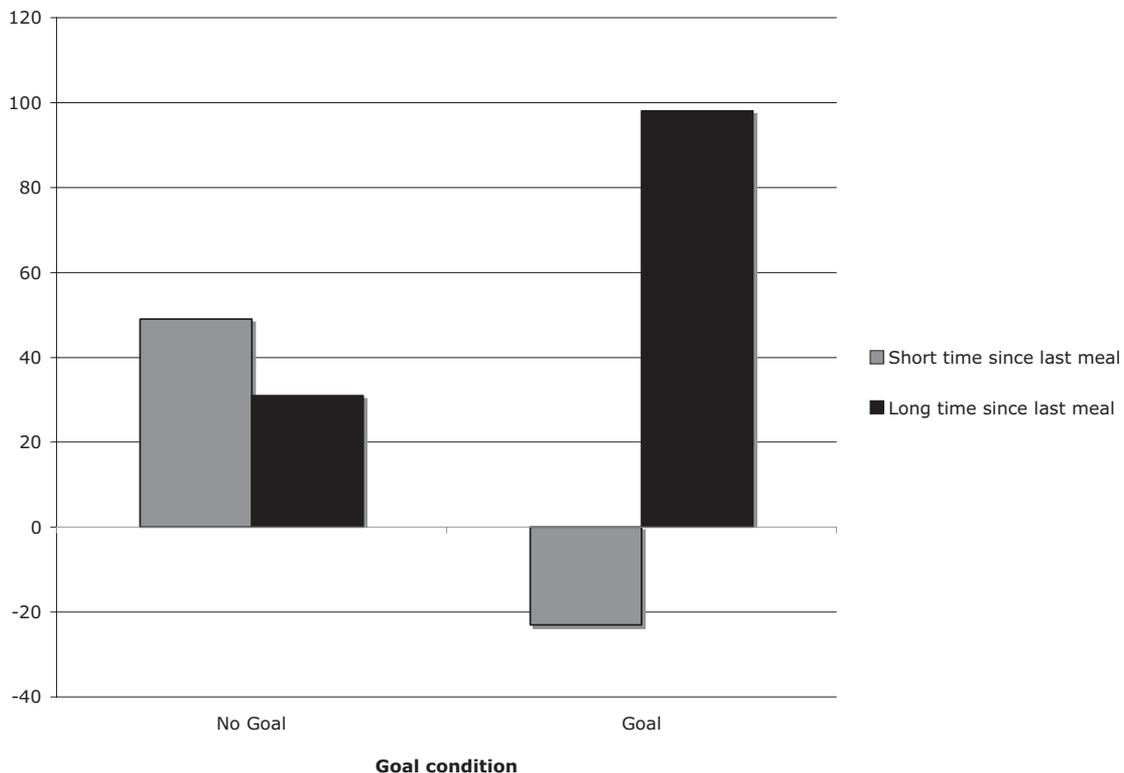


Figure 6. Average positivity toward food stimuli as a function of priming condition and time since last meal.

control condition), the more time had passed, the more positive their attitudes toward the food stimuli.

The present results extend the findings from the previous experiments by showing that the current desirability or importance of a goal can matter. It is not the case that any random nonconscious goal will make implicit attitudes toward goal-relevant stimuli more positive, just as it is not the case that any nonconscious goal will influence behavior (Aarts et al., 2004). Rather, the effect of a goal on implicit attitudes can depend on a person's skill at the goal (as shown in previous experiments) as well as a person's nonexplicitly reported motivation for the goal (as shown in the present experiment). Critically, these findings also add considerable support to the argument that the effects are motivational in nature. If the effects were purely semantic based, then one would not expect the effect of the goal on attitudes to vary depending on when participants last ate.

### Experiment 5

Across this and the previous experiments, the implicit activation of a goal led to changes in people's automatic attitudes toward goal-related stimuli. But, one remaining question is whether people's automatic attitudes toward goal-relevant stimuli then, in turn, predict their goal-relevant behavior. Are people who become "evaluative ready" for a goal actually more likely to pursue it? A burgeoning literature suggests that they would be (see, e.g., Wittenbrink & Schwarz, 2007), and in this experiment I sought direct evidence of this.

I examined whether the implicit activation of a cooperation goal (e.g., Bargh et al., 2001; Fitzsimons & Bargh, 2003) would lead to an evaluative readiness to pursue that goal. Because a cooperation goal seems easy to enact, and because participants have reported in other experiments in the lab that they consistently highly value the goal of helping others, I did not examine whether skill or motivation moderated this effect. A cooperation goal was activated implicitly, and the attitudes were activated nonconsciously. I predicted that those primed with the goal (vs. not) would display more positive automatic attitudes toward the goal itself.

I also tested whether participants who were implicitly primed with cooperation and who became "evaluatively ready to cooperate" would in fact be more likely to cooperate, even when faced with a highly attractive alternative option. Participants were told that the experiment ended 15 min earlier than they expected and that they could decide how much of the remaining minutes (if any) in their session they would spend on completing some optional surveys for the graduate students in the lab. In order to ensure that participants would in fact strongly prefer to leave the experiment as quickly as possible rather than completing additional surveys for the graduate students, I conducted a pilot study with 19 participants. Participants were asked to imagine that they were in a typical psychology experiment and that it ended 15 min earlier than they expected. On an 11-point scale ranging from 1 (*not at all happy*) to 11 (*extremely happy*), participants indicated that they would be very happy to leave the experiment early ( $M = 9.32$ ), and this average was significantly greater than the midpoint of the scale,  $t(18) = 10.5, p < .001$ . Participants also indicated along an 11-point scale ranging from 1 (*not at all ready*) to 11 (*extremely ready*) that they would be very ready to leave the experiment early, ( $M = 9.53$ ), which is also significantly greater than the scale midpoint,  $t(18) = 9.34, p < .001$ . Participants in this pilot study

were also asked to indicate how willing they would be to spend some additional time (after learning that their experiment ended early) completing surveys for the graduate students. Participants were not very willing to stay according to an 11-point scale ranging from 1 (*not at all willing*) to 11 (*very willing*) ( $M = 4.63$ ), and the average is significantly below the midpoint of the scale,  $t(18) = -2.93, p = .009$ . This pilot study provides support for the notion that participants should be motivated to leave an experiment as early as possible and that choosing to spend additional minutes completing surveys is not highly desirable. This ensures that the default option for participants in such a scenario would be to spend very little time on the surveys and makes cooperative behavior (helping the graduate students with the surveys) less likely.

In this experiment, I predicted that those who had been primed with the cooperation goal would be willing to spend more of their remaining minutes on the surveys than those not primed. I also predicted that for those participants in the goal condition, their implicit positivity toward the goal would significantly predict that willingness.

### Method

**Participants.** Forty-eight undergraduates (31 women) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

**Materials.** In the subliminal goal priming paradigm, the goal primes consisted of the words *cooperation*, *helpful*, *giving*, *kind*, and *nice*. The control stimulus was *zxcvbnm*. In the attitude measure, the words *help* and *generous* were used as the goal-relevant words. The control primes in the attitude measure were unrelated to the cooperation goal and were similar to the control primes in previous experiments. The target adjectives were the same as those used in previous experiments.

**Procedure.** Participants arrived at the lab and were first asked to complete a "letter detection" computer task. They were randomly assigned to the goal or control condition. For the computer task, they were told that they would see a series of strings containing the letter *X* and occasionally the letter *O*. Each letter string would appear on the screen briefly, and they were asked to indicate whether an *O* was present in the string or not. This constituted the subliminal goal priming paradigm. In each trial, a mask ("@#%&\*#&\$") first appeared for 97 ms. Then either a goal prime or nonsense prime (depending on condition) appeared for 28 ms. Then the same mask appeared for 97 ms. The target letter string then appeared for 306 ms. Participants were asked to indicate whether an *O* had appeared in the letter string (yes or no). The ITI was 1,000 ms, and there were 50 trials. In the goal condition, each of the goal primes was presented 10 times. In the control condition, the nonsense prime was presented 50 times.

After participants finished the computer task, they were given a 30-s break and were asked a series of questions about the previous task (e.g., "What letter were you asked to detect?" "How many times do you think the letter appeared?" "Did you use any particular strategy for the previous task?"). These questions were used as fillers and were meant to allow time to pass before participants completed the attitude measure. In the attitude measure, the *help* and *generous* primes were each presented four times with positive targets and four times with negative targets. Each control prime was presented once with a positive target and once with a negative

target. The instructions, timing, and other parameters of the subliminal attitude measure were identical to those from the previous experiments.

The experiment so far (up through the attitude measure) was designed to take about 15 min, which ensured that participants would have, on average, about 15 min remaining at this point in their 30-min experimental session. After the attitude measure ended, the instructions on the computer screen informed participants that the present experiment was finished and that in the remaining time of the session, they had the option of completing some additional surveys. They were told that the surveys were related to the work of the graduate students in the lab, but because the surveys were not directly related to the present experiment, participants could indicate how much of the remaining minutes they would spend on the surveys. In this way, participants had to negotiate how much of their remaining time they would devote to the graduate students' surveys versus how quickly they wanted to finish the experiment. There were no direct mentions of helping or cooperation (or any other related synonyms) anywhere in the message.

After their option was explained to them, participants were told to enter the exact current time and that they should indicate how many of the minutes left in the session they would like to spend on the additional surveys (each experimental session was 30 min long). Participants then entered the number of minutes they were willing to spend on the surveys. They were told that this was necessary so the computer could determine what and how many surveys it should administer to them for the remainder of their session.

After participants entered the current time and then the number of minutes they wished to spend, they were told that they would first answer some general questions about the present experiment before starting the surveys. They were asked about their mood on a scale between 1 and 9 (1 = *bad*, 9 = *good*) and then about their impressions of the purpose of the present experiment and whether they found anything unusual or unexpected about any part of the experiment. Participants were also asked whether they saw any real words in the initial "letter detection" task, whether they saw any real words appear during the attitude measure, and whether they felt like any of the components of the experiment were related to one another. They were also asked to indicate whether they found the request to do additional surveys strange or unusual in any way. They were then told that they would not have to do any additional surveys and were fully debriefed and thanked for their participation.

## Results

Of the participants, 3 reported seeing words flashed in the letter detection computer task, and 2 (other) reported seeing words in the attitude task. One participant expressed suspicion about the request for additional surveys. These participants were excluded from analyses. None of the participants guessed the hypotheses.

Participants had 14.3 ( $SD = 5.4$ ) min, on average, remaining in the experimental session when they were asked about doing additional surveys, and this did not vary between the goal and control conditions ( $p > .2$ ). The percentage of remaining minutes that participants were willing to spend on the graduate students' surveys was calculated. As predicted, those in the goal condition

devoted a significantly greater percentage of their remaining minutes to the additional surveys ( $M = 48\%$ ), compared with those in the control condition ( $M = 33\%$ ),  $t(40) = -1.88$ ,  $p = .034$  (one-tailed).<sup>10</sup>

The analyses of the RT data were conducted on correct responses only (the error rate was 5%). RTs that were faster than 250 ms or slower than three standard deviations above an individual's mean were excluded. Analyses performed on untransformed RTs versus log-transformed RTs were identical. For ease of interpretation, the results from analyses in which untransformed means were used are reported. Automatic positivity toward the goal and control primes was computed in the same way as in previous experiments.

How did the goal manipulation influence participants' implicit attitudes? I entered their automatic positivity toward the goal into a univariate analysis of covariance (ANCOVA), with goal priming condition (goal, no goal) as the between-participant variable and automatic positivity toward control primes as the covariate. The predicted main effect of goal condition was significant,  $F(1, 39) = 4.2$ ,  $p < .05$ ,  $\eta^2 = .10$ . Those in the goal condition displayed significantly more positivity toward the goal-relevant primes ( $M = 26$  ms) than those in the control condition ( $M = -24$  ms). I also conducted an ANCOVA predicting participants' implicit positivity toward the control primes, with goal condition as the independent variable and implicit positivity toward the goal primes as the covariate, and in this case, there was no effect of the goal condition ( $F < 1$ ), as would be expected.

Do participants' automatic attitudes toward the cooperation goal predict how much of their remaining time they are willing to devote to the additional surveys? To examine this, I conducted a regression analysis predicting percentage of time with the predictors of goal condition (goal condition coded as 1, control condition coded as -1), automatic positivity toward the goal primes, the interaction between goal condition and automatic positivity toward the goal, and automatic positivity toward the control primes as a covariate (see Table 6). There was a marginal trend for the goal condition to predict helping behavior ( $B = 6.56$ ,  $SE = 3.9$ ,  $t = 1.6$ ,  $p = .109$ ). However, the only significant effect in the analysis was the predicted interaction between goal condition and participants' automatic attitudes toward the goal ( $B = 0.13$ ,  $SE = .05$ ,  $t = 2.72$ ,  $p = .01$ ). This interaction between goal condition and automatic positivity toward the goal is graphically displayed in Figure 7 using automatic positivity scores one standard deviation above or below the mean. To examine this interaction, a regression analysis was performed in each of the two goal conditions. Specifically, in each condition, percentage of time was regressed onto automatic positivity toward the goal primes and automatic positivity toward the control primes. In the control condition, neither predictor was significant (both  $ps > .16$ ). In the goal condition, automatic

<sup>10</sup> Most participants in both the goal and control condition devoted at least a little bit of their remaining time to the surveys rather than leave immediately. The percentage of those who were willing to stay for at least some amount of time (vs. leave immediately) in the goal condition ( $M = 95\%$ ) and the control condition ( $M = 79\%$ ) was not statistically different according to a Pearson chi-square  $2 \times 2$  analysis,  $\chi^2(1, N = 42) = 2.76$ ,  $p = .096$ .

Table 6  
Summary of Multiple Linear Regression Analysis for Variables Predicting Helping Behavior (Percentage of Time Willing to Spend on Additional Surveys; Experiment 5)

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Goal condition	6.56	3.99	.25**
Automatic positivity toward control primes	0.018	0.05	.06
Automatic positivity toward goal primes	0.03	0.05	.11
Goal $\times$ Positivity Toward Goal Primes	0.13	0.05	.40*

Note.  $R^2 = .24$ .

\*  $p < .05$ . \*\*  $p < .10$ .

positivity toward the goal primes was significant ( $B = 0.17$ ,  $SE = .07$ ,  $t = 2.57$ ,  $p < .02$ ).

Finally, participants' mood was not influenced by the goal manipulation. There was no significant difference in mood for those in the goal ( $M = 6.30$ ) versus control ( $M = 6.05$ ) conditions ( $t < 1$ ).

### Discussion

Participants who were implicitly primed with cooperation (vs. not) were willing to spend a significantly greater percentage of their remaining minutes in the experimental session completing optional surveys for graduate students. This finding suggests that participants who were implicitly primed with cooperation were more willing to forgo the highly attractive option of leaving as soon as possible and instead were willing to stay and complete

additional surveys that were completely unrelated to the experiment they had signed up for. This result replicates research on the implicit activation and pursuit of a cooperation or helping goal (e.g., Bargh et al., 2001; Fitzsimons & Bargh, 2003).

Beyond influencing participants' behavior, the implicit goal manipulation also influenced their implicit attitudes toward the goal. In line with the findings from the rest of the experiments in the present article, those who were primed (vs. not) showed significantly more positive implicit attitudes toward the goal. This means that participants who were subliminally primed with the cooperation goal became "evaluatively ready" to pursue it. This evaluative readiness should predict actual behavior, and, indeed, for those in the goal condition, participants' implicit attitudes toward the cooperation goal significantly predicted their cooperation. In this way, the findings from this experiment show that a person who becomes evaluatively ready to pursue a goal is in fact more likely to pursue it.

### General Discussion

Findings across the experiments demonstrated that the activation of a goal led to the evaluative readiness to pursue that goal, even when participants had no conscious awareness or intentions regarding the goal or the goal-relevant stimuli. This suggests that the nonconscious activation of a goal does lead to the reclassification of the desirability of stimuli in the environment according to the goal. Moreover, this implicit evaluative readiness emerges especially for those who have some chronic skill at the goal and for those for whom the goal is currently highly relevant. In Experiments 1a, 1b, and 2, participants who were skilled at academic achievement generated more positive automatic attitudes toward goal-relevant stimuli when they were primed with the achievement

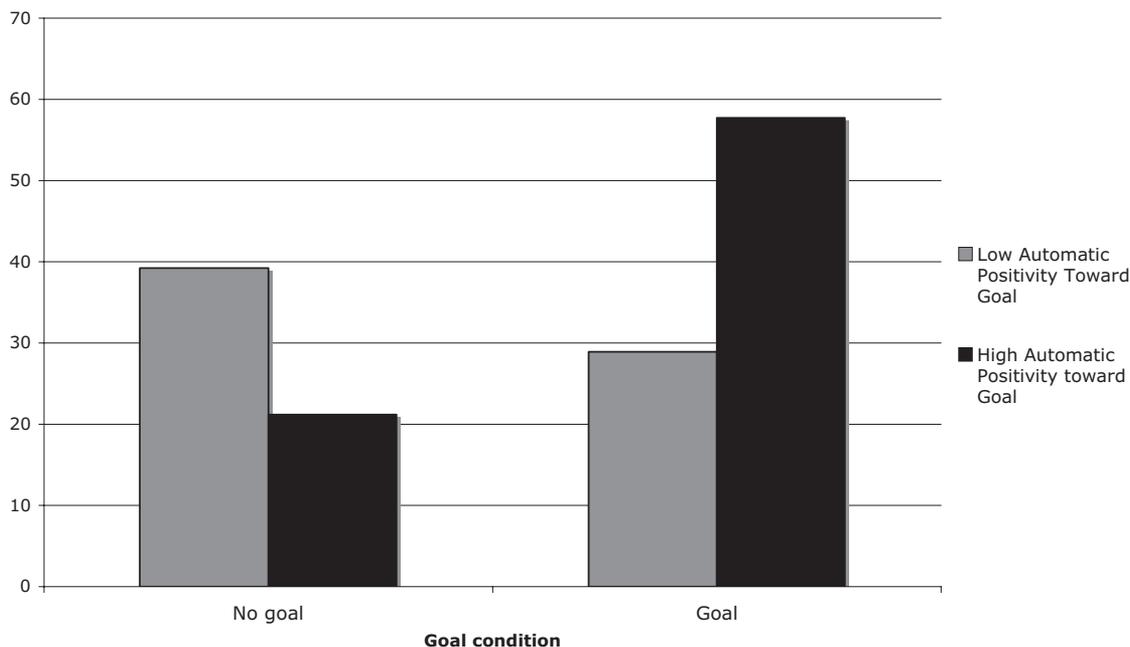


Figure 7. Average percentage of time participants were willing to spend on surveys as a function of goal condition and automatic positivity toward the goal.

goal versus not. In Experiment 3, participants who were skilled at the goal to be thin generated more positive automatic attitudes toward goal-relevant stimuli when they were primed with the thin goal versus not. And, in Experiment 4, the amount of time that had elapsed since participants last ate predicted whether the nonconscious eating goal (vs. a control goal) led to more positive implicit attitudes toward food.

And yet, not all goals vary significantly in terms of people's skill at them or immediate motivation for them. When a goal is easily enacted and highly desirable, people, on average, should become evaluatively ready to pursue it once it has been activated (see also Ferguson & Bargh, 2004; Sherman et al., 2003), even if the goal and attitudes are activated implicitly. In Experiment 5, participants who were nonconsciously primed with a cooperation goal automatically generated more positive attitudes toward goal-relevant stimuli. More important, their evaluative readiness then significantly predicted their cooperative behavior.

The findings from Experiments 2 and 3 also demonstrated that the effect of the goal either lasted over 6 min (Experiment 3) or increased (Experiment 2), whereas semantic priming effects tend to decay within that same amount of time (see, e.g., Higgins et al., 1985; Srull & Wyer, 1979; Wilson & Capitman, 1982). This increase or durability in the strength of the effects suggests that the effects were indeed motivational in nature, rather than resulting from mere semantic or behavioral priming. Additionally, the findings from Experiment 4 showed that the effect of a nonconscious eating goal on evaluative readiness depended on people's current deficit for that goal. This also suggests a motivational process at work rather than a semantic-based one, as one would not necessarily expect that the effect of a semantic construct on attitudes would vary depending on when participants last ate. I now turn to a discussion of some theoretical implications of the findings.

### *Nonconscious Goal Pursuit*

The research on nonconscious goal pursuit has largely focused on documenting the behavioral effects that follow from a nonconscious goal (e.g., Aarts et al., 2004; Bargh et al., 2001; Fitzsimons & Bargh, 2003; Kawada et al., 2004; Shah & Kruglanski, 2003). This research has shown that whenever people are subtly exposed to cues that have previously been linked with a certain goal, they exhibit classic motivational behavior toward that goal, without any reported awareness of doing so. These cues in one's environment are subtle and presumably commonly encountered and range from goal-relevant words (e.g., *judge*, *evaluate*; Chartrand & Bargh, 1996) to strangers' goal-relevant behaviors (see Aarts et al., 2004) to the names or descriptions of one's relationship partners (e.g., a best friend or parent; see Fitzsimons & Bargh, 2003; Shah, 2003).<sup>11</sup> For example, Fitzsimons and Bargh (2003) showed that when participants who had the chronic goal to make their mother proud were implicitly primed with their mother, they performed significantly better on an anagram task than those who were not primed and than those who did not possess that goal. The demonstration of a variety of behavioral effects following nonconscious goal activation is essential given that goal pursuit is defined according to specific criteria of behavior, including persistence, resumption after disruption, and an increase in goal strength over time (e.g., Atkinson & Birch, 1970; Gollwitzer & Moskowitz, 1996; Lewin, 1936; McClelland et al., 1953).

Recently, research has begun to address exactly how a nonconscious goal might lead to such downstream behavioral effects (e.g., Custers & Aarts, 2005; McCulloch et al., 2008). For example, Custers and Aarts and colleagues (e.g., Aarts, Custers, & Holland, 2007; Custers & Aarts, 2005) argued that nonconscious goals guide behavior according to the positive affective information included in the representation of the goal. That is, in the absence of a conscious desire and intention to pursue a certain end state, behavior can be nonconsciously guided and shaped by the pull of positive affective information associated with a given end state. Accordingly, the implicit activation of a goal has the greatest effect on those who chronically possess positive affect in the goal representation (Custers & Aarts, 2007; see also Ferguson, 2007). This may suggest that only those for whom goal-relevant cues have been linked previously with approach behavior toward the goal (or positivity) will show such approach behavior after perceiving those cues implicitly.

The present work expands on these findings by demonstrating that the nonconscious activation of a goal can in fact (temporarily) *change* the relative accessibility of positive information related to goal-relevant means and stimuli. Namely, it increases the accessibility of such knowledge, which, in turn, renders those goal-relevant stimuli more positive, and therefore more likely to be approached whenever the goal has been activated. This reveals one way in which the activation of a goal is able to guide a person increasingly toward goal-relevant versus irrelevant actions, to a greater extent than when the goal is not activated.

In summary, the present work helps to reveal how the nonconscious activation of a goal is able to delimit the person's likely courses of action. Once a goal has been activated, the person's appraisal of the stimuli around her or him shifts in a way that makes goal-relevant behavior more likely. And, as the findings from Experiment 5 showed, those who become more evaluatively ready in this way are, in turn, more likely to pursue the goal. Assuming that this reclassification of the desirability of stimuli in the environment is an essential part of goal pursuit, these findings provide further evidence that people can be guided toward an end-state without necessarily being aware of or intending it (see also Ferguson & Porter, in press; Fishbach & Ferguson, 2007).

### *Implicit Mechanisms in Conscious and Nonconscious Goal Pursuit*

The findings also have implications for understanding how goals more generally change how people see and interpret the world around them. Psychologists have long noted that the activation of a goal changes the accessibility of knowledge relevant to that goal and that such changes should enable the person to better meet the goal (e.g., Aarts et al., 2001; Anderson, 1983; Balci et al., 2006; Bruner, 1957; Förster et al., 2005; Goschke & Kuhl, 1993; Higgins & King, 1981; Moskowitz, 2002). The more that knowledge about restaurants is accessible for a hungry person,

<sup>11</sup> Given how easily goals can be activated nonconsciously, a pressing issue in contemporary nonconscious goal research is the identification of the factors that predict which of the presumably numerous (positively valenced and familiar) goal cues in one's environment ultimately guides and shapes his or her motivational behavior, a question also raised in response to the literature on implicit priming effects more generally.

for instance, the more likely that person should be to spot the café hidden among other stores along an unfamiliar city street (see Bruner, 1957, p. 132). Bruner (1957) argued that such “perceptual readiness” is critical for allowing people to maximize their chances of finding things they *want*, rather than solely things they *expect*. From this perspective, an increase in the accessibility of memories that facilitate an active goal would seem to be functional (see also Balcetis & Dunning, 2006; Förster et al., 2005; Shah et al., 2002).

The present findings extend work on the implicit mechanisms of goal pursuit by demonstrating the role of evaluative processes. In particular, the findings show that the activation of a goal does not simply make goal-helpful information more accessible, it also makes it more implicitly positive, in line with previous work (Ferguson & Bargh, 2004; Sherman et al., 2003). The present findings also show that such evaluative readiness does not always emerge for all participants on average, but instead emerges especially for those who are skilled in that goal domain (especially when the goal is relatively difficult). In this way, just as a person’s *perceptual readiness* predicts his or her success at the respective goal (e.g., Shah et al., 2002), a person’s *evaluative readiness* (for either a conscious or nonconscious goal) does the same. Additionally, the findings show that evaluative readiness is most likely to occur for those for whom the goal is most currently relevant or desirable. The moderation of evaluative readiness according to current motivational levels adds support to the notion that the underlying process is motivational in nature rather than purely semantic.

Future research might examine the ways in which perceptual readiness and evaluative readiness together predict successful goal pursuit better than either one individually. Perceptual readiness should ensure that the person attends to those things in the environment that would facilitate the currently active goal. And, such an effect is important given that attending to a given stimulus is often a prerequisite to acting on that stimulus. However, the evaluative connotation of the stimulus should further specify the *way in which* the person should act toward it (i.e., approach or avoid). Accordingly, perceptual and evaluative readiness might together best predict whether someone secures those stimuli (or enacts those behaviors) that can help her or him successfully achieve a goal. Future research on goal pursuit and self-regulation might consider both types of implicit preparedness.

### *Implicit Processes in Self-Control*

Beyond goal pursuit more broadly, recent research suggests that successful self-control in particular depends in part on a host of implicit processes. Self-control involves the adherence to difficult long-term goals over more immediately attractive short-term goals. On the one hand, this research shows that people who are skilled at a goal implicitly respond to the world around them in a highly consistent fashion. When such people encounter clear and unambiguous threats to the long-term goal at which they are skilled, they respond in a way that facilitates that goal. For people who are skilled at academics, for example, the perception of distractions, such as TV-watching, makes the academic goal more accessible in their minds, which should enable them to stay the course (Fishbach et al., 2003). Similarly, people who are skilled at a goal are faster at implicitly approaching stimuli that can help them achieve that goal, and also faster at implicitly avoiding those stimuli that might

undermine their goal (Fishbach & Shah, 2006). These findings show that people who are skilled at a given goal do develop chronic, implicit tendencies to approach *certain* stimuli that are consistently beneficial for their goal and avoid certain stimuli that are almost always disruptive to their goal.

But, there are presumably many stimuli in our environment that are tied to, or reminiscent of, a diverse array of memories, not all of them goal related, and possibly many of them even related to opposing goals (see Kruglanski et al., 2002). The present findings show that people who are skilled at a given goal do not necessarily chronically interpret such diverse stimuli in line with that goal. The goal must be primed in order for goal-relevant interpretations and evaluations of those stimuli to follow. This suggests that even people who are chronically skilled at a certain goal, such as academics, do not implicitly interpret and evaluate the stimuli around them according to that one goal to the detriment of all others. Instead, they shift their implicit reactions to the world around them according to the goal that is most accessible at the time.

### *The Relationship Between Skill and Evaluative Readiness*

I have argued that people’s skill at a goal should predict their evaluative readiness for it whenever it is activated, and all of the experiments in which I tested this claim supported it. The hypothesis that skill should predict evaluative readiness is derived from one of the main assumptions concerning automatic attitudes. Namely, people’s automatic attitudes tend to predict reliably (i.e., reflect) their tendency to approach or avoid the respective stimuli (for reviews, see, e.g., Fazio & Olson, 2003; Petty et al., in press; Wittenbrink & Schwarz, 2007). The more positive one’s automatic attitude toward a given stimulus, the more that person should approach that stimulus, on average. In terms of the present research, this means that those who generate positive automatic attitudes toward goal-related opportunities whenever the goal is activated should be expected to take advantage of—that is, approach—those opportunities. It seems reasonable to also expect that those who do so should be more successful at those goals, on average, compared with those who do not. The findings from four of the present experiments support this claim. Those who were the most skilled at a given goal were also the most likely to become evaluatively ready for that goal once it was (nonconsciously or consciously) activated.

However, as discussed in the introduction of this article, what is the causal direction between skill and evaluative readiness? It seems likely both that someone’s skill at a goal will foster the development of evaluative readiness and that those who develop evaluative readiness should have an easier time successfully attaining the goal. The notion that one’s skill at a goal will lead to evaluative readiness is consistent with assumptions about the formation of attitudes. Specifically, the attitudes literature suggests that attitudes reflect accumulative experience with a given stimulus (see, e.g., Betsch, Plessner, Schwieren, & Gütig, 2001), at least within certain contexts. So, the more a person approaches a stimulus within a given context, the more positive that person’s attitude toward the stimulus should become (see, e.g., Kawakami, Phills, Steele, & Dovidio, 2007). From this perspective, those who consistently (vs. only occasionally) approach goal opportunities *when the goal is activated* should be more likely to develop positive

automatic attitudes toward such opportunities within the context of that goal. And, again, those who regularly (vs. periodically) take advantage of goal opportunities whenever the goal is active should be most likely to be successful.

Critically, although skill can lead to evaluative readiness, this does not imply that such goal-dependent automatic attitudes would be irrelevant for behavior thereafter once they are formed. On the contrary, there is considerable evidence that automatic attitudes serve as quick and ready guides for behavior (e.g., Chen & Bargh, 1999; Damasio, 1999; Fazio, 1989; Fazio et al., 1992; Fazio & Powell, 1997; Ferguson & Bargh, 2002, 2004; Lang, Bradley, & Cuthbert, 1990; LeDoux, 1996; Öhman, 1986; Roskos-Ewoldsen & Fazio, 1992). Such rapid signals are functional in that they do not demand the extensive thought, rumination, and effort that are so costly to one's capacity for self-control (e.g., Baumeister et al., 1998; Muraven et al., 1998). A skilled person who develops evaluative readiness (vs does not) should be able to pursue goal opportunities more easily and quickly. In this way, the relationship between skill and evaluative readiness is iterative and dynamic. The more a person becomes skilled at a goal, the more that person should eventually develop automatic "approach" signals toward goal opportunities whenever the goal is active. And, the more one develops such automatic approach signals toward opportunities, the more that person should be able to successfully navigate the environment to take advantage of those opportunities.

The present discussion suggests that evaluative readiness can be considered as both an implicit *signature* and *tool* of effective goal pursuit. By way of an analogy, some novice tennis players are able to learn and then enact behaviors that prove effective on the tennis court. Players who can perform such effective maneuvers over and over again eventually are able to perform them fluently and effortlessly (see, e.g., E. R. Smith, Branscombe, & Bormann, 1988; E. R. Smith & Lerner, 1986). In this way, the ability to automatically perform such effective maneuvers can be considered an implicit *signature* of a skilled tennis player. However, this automatization also further enables and facilitates performance. The more quickly and effortlessly a tennis player can "do the right thing" while on the court, the better his or her game should be. Such "automatic moves" in this way constitute an implicit *tool* of a skilled player.

Future research can examine directly the degree to which evaluative readiness might be experimentally manipulated in order to improve successful goal pursuit. Participants could complete evaluative conditioning paradigms such that some participants learn links between a goal and positive aspects of means for that goal, whereas others do not. For example, participants could be presented with repeated trials in which a goal is followed by a relevant activity, which itself is followed by positive information (e.g., *achievement*–*library*–*sunshine*). After many such trials people might be able to develop the associations that would lead them to evaluate library automatically as positive whenever achievement is activated, for instance. And, given research suggesting the potential causal influence of automatic attitudes on motivated behavior (see, e.g., Aarts, Custers, & Holland, 2007; Custers & Aarts, 2005), such people should be more likely to go to the library compared with those who do not receive such evaluative conditioning. More generally, those who are manipulated into having such associations would be expected to succeed more than those who are not, holding other factors constant. This suggests that goal

pursuit and self-regulation might be able to be enhanced and improved through the "associative restructuring" provided by such implicit paradigms (e.g., see also Kawakami, Dovidio, & van Kamp, 2005; Olson & Fazio, 2006).

### *The Relationship Between Motivation and Evaluative Readiness*

These findings revealed how people's *reported* versus "*actual*" motivation for a goal might qualify the effect of a nonconscious goal on evaluative readiness. People's explicitly reported motivation for a goal does not necessarily predict the likely influence of that goal on their subsequent attitudes and behavior. This may especially be the case when the goals are generally desirable. People may refer to their theories of how important or desirable the goal is rather than accurately introspect on the personal, or current, importance of the goal. As previous research has indicated, people may be less than accurate when trying to introspect consciously on their goals, attitudes, judgments, and behaviors (see, e.g., Ferguson, 2007; Wilson, 2002; Wilson & Dunn, 2004). Moreover, explicitly reported motivation may be somewhat nonpredictive for implicit goal pursuit in particular.

And yet, a more objective index of the likely motivation for a goal does predict the effect of that goal. In Experiment 4, the time that had passed since participants last ate did predict the effect of the nonconscious eating goal on their evaluative readiness to pursue it. In contrast, participants' explicitly reported levels of hunger did not. In this case, it may be that the reporting of how much time had passed was less susceptible to conscious editing, guessing, and theorizing than people's estimates of their subjective hunger level.

The findings across the experiments on the moderators of motivation as well as skill provide a nuanced profile of when nonconscious goals will make people evaluatively ready to pursue them. It is not the case that people become ready to pursue any goal to which they are implicitly exposed. Rather, it likely happens especially for goals that are desirable and currently important to the person. It also likely happens for goals at which the person has had some degree of success. These findings therefore suggest that even though goals can nonconsciously make people evaluative ready and likely to pursue them, without a conscious realization or intention to do so, the effect seems to be limited to goals that people value currently and have pursued successfully in the past.

### *Conclusion*

The last 30 years of research in social psychology has shown that many of the social phenomena traditionally assumed to be under people's conscious guidance and intentions can actually operate largely without either one. That is, stereotypes, attitudes, person judgments, and behaviors can all become activated in people's memory without their awareness, and once unknowingly activated can influence their interpretation and action in the world, again without a person's knowledge or consent of such effects. The latest strand of evidence for automaticity concerns people's motivational pursuits. Apparently, unknowingly perceiving cues that are linked in a person's memory with striving toward some endpoint can alter his or her motivational behavior. Such a prompt can influence how people integrate social information, how long peo-

ple persist at an endeavor, how people make decisions and judgments, and a person's nonverbal expressions and gestures, all with minimal or no awareness of such effects. The present work identifies *evaluative processes* as a potential bridge between the nonconscious activation of a goal and those downstream decisions and behaviors that eventually follow. In this way, evaluative readiness may be one vehicle that silently transports a person from the goal to the goal pursuit.

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