

# The Mind in Motivation: A Social Cognitive Perspective on the Role of Consciousness in Goal Pursuit

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## Abstract

This chapter summarizes and critically evaluates recent social cognitive work on the construct of human goals. The authors begin by defining goals from a social cognitive perspective, and then introduce what they believe is one of the most important outstanding questions in contemporary research on goal pursuit: What is the role of consciousness? The authors identify the conceptual landscape of this question and summarize what current evidence indicates as well as outstanding theoretical issues and unexplored questions. A number of interesting avenues for future research are identified.

**Key Words:** goals, consciousness, automaticity, nonconscious goals

Understanding human goal pursuit has historically been at the forefront of social psychological research, even while the popularity of the topic has waxed and waned in other areas of psychology (e.g., Kunda, 1999). Identifying the antecedents, mechanisms, and consequences of a person's goals is fundamentally part of any functional analysis of human behavior. After all, as many scholars have noted over the years, for predictive purposes it is essential to know not just *what* another person is doing but also *why*, and for this we need access to another's goals. Similarly for the self, the human capacity to imagine the self in a hypothetical future naturally allows for idealized states toward which the person can strive as well as aversive states the person can try to avoid. And, experientially, the pursuit of goals makes up a significant chunk of people's everyday cognition, behavior, and emotion (for a review, see Shah & Gardner, 2008).

In the current chapter, we summarize and critically evaluate recent social cognitive work on the construct of human goals. We begin with the definition of a goal from a social cognitive perspective, and then introduce what we believe is a major issue

in contemporary social cognition research on goals: the role of consciousness (i.e., awareness; though see Baars, 1998; Chalmers, 1996; Churchland, 1983; Damasio, 1999; Dennett, 1991; Gazzaniga, 1988; Papineau, 2002; Searle, 1990). We identify the conceptual landscape of this question, and then turn to what the literature demonstrates, and also what it misses. We then consider future research and other relevant theoretical questions.

## What Is a Goal?

In line with current formulations in the social cognitive literature, we define a *goal* as a mentally represented, desired end state that fluctuates in accessibility, contains many different representations (e.g., end states, means, abstract, concrete, positive, negative, visual, auditory), and influences cognition, emotion, and behavior (see Bargh, 1990; Custers & Aarts, 2010; Fishbach & Ferguson, 2007; Kruglanski, 1996; Shah & Gardner, 2008; for a psychobiological operationalization, see Hazy, Frank, & O'Reilly, 2006). The exact nature and format of the representations, including the way in which they are interconnected, is not yet clear (see

discussion in Ferguson & Wojnowicz, 2011), but some of the functional characteristics of goal representations and how they interconnect have been gleaned from empirical data. For instance, they seem to follow basic principles of information processing in that any given goal representation can vary in its accessibility (i.e., likelihood of being applied to relevant stimuli; see Bruner, 1957; Higgins, 1996) and can, in turn, influence the accessibility of associated representations in either an excitatory or inhibitory manner (e.g., Aarts, Dijksterhuis, & De Vries, 2001; Fishbach, Friedman, & Kruglanski, 2003; Förster, Liberman, & Higgins, 2005; Kruglanski, 1996; Moskowitz, 2002). Goal representations also exhibit a trajectory of activation that distinguishes them from nongoal (e.g., semantic) representations (Ach, 1935; Bruner, 1957; Kuhl, 1983); namely, after being activated (e.g., via priming), goal representations tend to stay activated until the goal is met or is disengaged from, unlike semantic representations, which typically decay uniformly in activation strength over a matter of minutes (for a review, see Förster, Liberman, & Friedman, 2007; Förster, Liberman, & Higgins, 2005).

Is there a quintessential ingredient that turns a bundle of representations into *goal* representations? Scholars have recognized the necessity of valenced information associated with the goal representations (e.g., Carver & Scheier, 1981; Custers & Aarts, 2010; Hazy, Frank, & O'Reilly, 2006; Kruglanski et al., 2002; Peak, 1955; Pervin, 1989; Shah et al., 2002; Young, 1961). After all, the basic (though not the only; see, e.g., Higgins, 1998) ingredients of motivation are seeking pleasure and avoiding pain. We can strive to attain or keep something pleasant, or strive to avoid or dispose of something unpleasant. Any representation, however complex, prescriptive, or procedural, is assumed to *propel* behavior in a persistent fashion only when that representation is associated with positivity or negativity. Researchers in this area have argued that behaviors or states either have to be evaluated consciously as something desirable or, in the absence of conscious evaluation, have positivity or negativity embedded within (or associated with) their representational structure (see Custers & Aarts, 2005, 2007, 2010) in order to motivate behavior.

The lion's share of social cognitive work on goals during the past two decades has focused on consciousness in goal pursuit. More precisely, this work has questioned the causal role of consciousness in goal pursuit (see Ferguson & Porter, 2010). In the discussion that follows, we first acknowledge the

traditional interpretation of goal pursuit as a conscious, effortful task, and also refer to current work on self-control that is consistent with this view. We then review the line of research that has challenged this approach during the past two decades, and then critically evaluate this work as well and discuss the relevant conceptual questions concerning the role of consciousness in motivation.

## Mindful Motivation

The classic motivation literature has assumed (e.g., Bandura, 1997; Carver & Scheier, 1981; Deci & Ryan, 1985; Gollwitzer, 1990; Metcalfe & Mischel, 1999)—and at times explicitly asserted (e.g., Bandura, 2006; Locke, 1995)—that consciousness is pivotal in the pursuit of one's goals. In Bandura's program of research on self-efficacy (e.g., Bandura, 1986, 1997), for example, people's consciously held expectancies and beliefs about their own agency are what causally influences their motivation and subsequent behavior. Similarly, in the discrepancy reduction model proposed by Carver and Scheier (1981), it is one's awareness of a discrepancy between one's aspirations and one's current state that leads the person to consciously derive plans and willfully engage in behaviors to reduce the perceived discrepancy. Researchers have also suggested that one's conscious feelings of autonomy are a primary determinant of motivated behavior (Deci & Ryan, 1985).

The task of pursuing one's goals inevitably involves choices among potential actions, and as the benefits and costs of those possible routes become more equivalent, the choice task becomes more difficult. The choice between an immediate but small reward versus a delayed but larger reward is a classic example of a dilemma in which people need to ideally choose the delayed, but more valuable, reward over the short-term temptation. The literature addressing this kind of goal pursuit—termed *self-control*—has relied heavily on the notion that conscious effort is crucial to being able to successfully navigate such dilemmas. Baumeister and colleagues have amassed a sizable amount of empirical evidence showing that this kind of conscious effort is a finite resource that relies on glucose consumption and can be used up relatively easily (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister, Heatherton, & Tice, 1994; Baumeister, Vohs, & Tice, 2007; Gailliot et al., 2007). For example, participants who were asked to suppress their emotional reaction to a short, emotional video clip subsequently held a handgrip—an activity that requires people to

override the natural impulse to let go of the grip and continue exerting pressures—for significantly less time than did those who did not first attempt the emotional suppression (Baumeister et al., 1998). One underlying assumption in this work is that it is the person's conscious effort to regulate the self that is at the causal center of successful self-control (i.e., goal pursuit). This program of research is therefore largely consistent with the traditional perspective on how people reach their goals: through conscious will, intention, effort, and deliberation.

### Mindless Motivation

Research in social cognition during the past 15 years has challenged whether consciousness is a necessary feature of goal pursuit. This general approach has relied on a two-phase procedure in which the researcher first tries to trigger a goal in participants by exposing them to some unseen or unnoticed cue, and then in the second phase, looks for evidence of participants' motivated behavior toward that goal. The unnoticed triggers of goals have included goal-relevant words hidden in word games (e.g., *achievement*), the names of significant others (e.g., *mother*), environments with salient social norms (e.g., the library), or another person's goal-relevant behavior (e.g., Aarts & Dijksterhuis, 2000; Aarts, Gollwitzer & Hassin, 2004; Bargh et al., 2001; Chartrand & Bargh, 1996; Ferguson, 2008; Fitzsimons & Bargh, 2003; Shah, 2003; Shah & Kruglanski, 2002).

The second phase—measuring any motivated behavior—is theoretically more complicated in that it presupposes that behavior that is motivated can be distinguished from behavior that is not motivated. Based on classic literature on motivation, the main assumptions are that someone who is motivated should be more persistent and overcome interruptions and obstacles to a greater extent than someone who is not. But, how could such complicated, flexible, and seemingly effortful behavior be mindless? Indeed, the realization of a goal involves a set of operations that seemingly have all of the hallmarks of a complex and dynamic conscious process: we must find ways to steer clear of the many distractions that we face, to somehow manage and prioritize the numerous goals we often juggle at any one time, to adaptively handle setbacks and overcome obstacles when our initial efforts fail, and, on occasion, to know when our time and effort are better spent on other pursuits. How is it that such processes could operate without any conscious involvement? The auto-motive

model (Bargh, 1990; Bargh & Gollwitzer, 1994) provides a theoretical framework for understanding how goal pursuit might proceed without awareness. The model proposes that goals are end states that are mentally represented in precisely the same way as other kinds of knowledge structures, such as concepts, judgments, and attitudes, and are thus associatively linked in memory to information related to their operation (though see Williams, Huang, & Bargh, 2009). For example, they are likely linked to situations in which they might be pursued, concrete means of achieving them, and various behaviors that allow one to enact these means (see Fishbach & Ferguson, 2007). These associative links are thought to develop over time through the repeated simultaneous activation of the goal and other related concepts or behaviors in memory. For example, if one's preferred means of pursuing a weight loss goal is running on a treadmill every morning before work, then over time, through the repeated simultaneous activation of the goal of weight loss and the behavior of running on the treadmill (and according to classic Hebbian learning rules; Hebb, 1949, 1961), the two become strongly associatively linked in memory, such that the mere perception of the treadmill can potentially activate the weight loss goal.

Importantly, such goal activation need not be conscious—that is, the auto-motive model does not merely suggest that after one consciously adopts a goal, it can operate nonconsciously. Rather, a goal may become activated outside of conscious awareness by features of the environment that are associatively linked to the goal, as in the treadmill example, and the entire goal pursuit, can, once activated, proceed entirely in the absence of conscious intervention. In other words, people may adopt a goal, engage in goal-directed behavior to bring it about, and succeed or fail in this effort, all without any realization of the activation or operation of the goal. This notion is consistent with research in social and cognitive psychology that has demonstrated that other types of mental representations can be automatically activated by features of the environment that are associated with the representation and can affect subsequent behavior outside of awareness (e.g., see Bargh, 2007; Devine, 1989; Fazio, 2001; Higgins, 1996). For example, stereotypes can be activated and potentially applied automatically, and this activation has been shown to have effects on thoughts, feelings, and behaviors directed toward outgroup members (Devine, 1989; Greenwald & Banaji, 1995).

Goals, too, have been shown in empirical research to be governed by these automatic activation principles. In one of the first demonstrations of nonconscious goal pursuit, Chartrand and Bargh (1996) attempted to conceptually replicate a classic finding in the social cognition literature concerning differences in the way that information is processed when people are consciously given either an impression formation goal or a memorization goal. In the original experiment (Hamilton, Katz, & Lierer, 1980), participants were exposed to a collection of behaviors performed by a target individual and were given a (conscious) goal to either memorize as many of the behaviors presented as possible, or to simply form an impression of the target. The paradoxical result was that people given the active memorization goal were found to remember *less* of the target information than participants simply asked to form an impression, in part because the act of attempting to memorize the information made these individuals less likely to organize the behaviors around a meaningful set of higher order traits, as the individuals who formed an impression did.

In Chartrand and Bargh's (1996) conceptual replication, rather than giving participants a conscious memory or impression formation goal, participants were asked to complete a sentence-unscrambling task in which they were subtly exposed to words semantically related to these goals. In the task, participants were asked to form grammatically correct four-word sentences using a series of words presented in random order (e.g., "somewhat memory prepared I was.") For some participants, a subset of the words that they unscrambled was related to an impression formation goal (e.g., "opinion," "personality," "impression.") Other participants were instead exposed to words related to a memorization goal (e.g., "absorb," "remember," "memory.") Participants then performed the same exercise as participants in the original experiment in which they were exposed to a series of target behaviors performed by an individual and given a recall test at the end of the experiment. Replicating the results of the original study, the goal-priming procedure had precisely the same effect on information recall as a consciously adopted goal: People primed with impression formation recalled more of the target individual's behaviors and were better able to sort the behaviors around a set of higher order traits than individuals primed with memorization. However, an especially important difference between these results and the results of the study by Hamilton and colleagues was that, in a thorough funneled debriefing procedure

at the end of the experiment, participants appeared not to have any awareness of either (1) a connection between the sentence unscrambling task and their memory for the behaviors (i.e., they had no awareness of the true purpose of unscrambling the sentences), or (2) the goal-directed nature of their behavior.

A second study was conducted to conceptually replicate this result and to rule out the possibility of any conscious influence on participants' behavior. This study was designed to replicate another classic result from the conscious goals literature (Hastie & Kumar, 1979) and employed a parafoveal subliminal priming methodology to activate the goal entirely outside of conscious awareness. Results once again demonstrated that the nonconscious activation of a goal had precisely the same consequences as a consciously adopted goal, pointing to a potential equivalence between conscious and nonconscious goal pursuit (see also McCullough, Ferguson, Kawada, & Bargh, 2008; Moore, Ferguson, & Chartrand, 2011).

These demonstrations established that the nonconscious activation of a goal can have effects on subsequent information processing. However, the main tenet of auto-motive theory is that nonconsciously activated goals can unintentionally influence behavior. Bargh and colleagues (Bargh et al., 2001) provided the evidence for these kinds of behavioral effects. Some participants were primed with an achievement goal, whereas others were not. This was accomplished by having participants complete a word search in which some of the target words were related to achievement (e.g., "achieve," "succeed") or not (controls). Next, participants completed an additional three-word search, and their performance on these word searches (i.e., how quickly they found the words in these puzzles) served as the primary dependent measure. The results showed that participants primed with an achievement goal performed better—that is, found more words—than controls. Similarly, in another study (Bargh et al., 2001, Study 2), participants who were primed with a cooperation goal acted more cooperatively in a subsequent resource dilemma game in which resources could be selfishly kept for oneself or cooperatively returned to a common resource pool in order to prevent the resources from being fully exhausted. This experiment provides converging evidence of robust behavioral consequences for the nonconscious priming of goals.

Importantly, in a thorough debriefing, participants seemed, like those in Chartrand and Bargh's

(1996) studies, to be unaware of the goal-directed nature of their behavior. To further rule out the possibility of any conscious influence on participants' behavior, Bargh et al. (2001) obtained a self-report measure of participants' commitment to the target goals. Interestingly, this measure was significantly correlated with actual behavior only when the goal was consciously adopted; that is, when participants were nonconsciously primed with a goal, these ratings of goal commitment had no relation to their behavior, strongly suggesting they were unaware of the activation or operation of the goal (see Hassin, Bargh, & Zimmerman, 2009, for a recent replication of this finding).

Of course, one salient alternative explanation for the above findings is that the observed behavioral effects were the result of semantic priming rather than the priming of a motivational state. By this account, the initial word search that participants completed was not an instance of goal priming, but rather was an instance of the kind of priming that has already been shown in past research, as when the word *doctor* automatically activated semantically related words such as *nurse* or *hospital*. In an attempt to differentiate these two interpretations, Bargh and colleagues investigated whether nonconscious goal activation exhibits the classic properties of motivational states (see Förster et al., 2007; Heckhausen, 1991). For example, one such property is that a goal looms larger as it goes unsatisfied, meaning that a goal should remain accessible until one has had an opportunity to meet it (Atkinson & Birch, 1970). In contrast, semantic priming effects have been shown to remain accessible for only a short period of time, decaying very quickly after activation (e.g., Anderson, 1983). In one study (Bargh et al., 2001, Study 3), Bargh and colleagues directly compared semantic priming and goal priming effects by first activating an achievement goal using the same procedures described above. Then, participants completed either a task that required goal-directed behavior (i.e., an anagram task that would allow them to pursue the achievement goal) or a perceptual judgment task that had been shown in previous research to be influenced by semantic priming procedures. The results showed a dissociation between the effects of ~~semantic versus goal priming~~. When participants completed the task requiring goal-directed behavior, the researchers obtained the predicted behavioral effect of the achievement prime, and this effect grew stronger after a five-minute delay during which participants completed an unrelated filler task. In other words, as the goal remained unmet

over time, it increased in accessibility and appeared to have a stronger influence on behavior. However, when participants completed the perceptual judgment task, there was only a significant effect when participants completed the task immediately after having been primed, but not after a five-minute delay, suggesting that activation quickly decayed after the priming manipulation. Thus, ~~although nonconscious goal priming has important effects on behavior, these effects can be differentiated from mere semantic priming effects and appear to reflect, instead, the activation of a motivational state that fosters relatively automatic goal-directed behavior~~. Subsequent studies have also demonstrated that goal priming leads one to resume goal-directed behavior after disruption and to engage in goal-directed behavior even in the face of obstacles—two additional hallmarks of motivated behavior that further dissociate goal priming from traditional semantic priming effects (Heckhausen, 1991).

This research established the existence of key similarities between conscious and nonconscious goal pursuit, and additionally established that goal priming exhibits critical dissociations from semantic priming. More recently, researchers have used nonconscious priming methodologies to replicate some of the classic findings in the goals literature that were previously assumed to be specifically governed by conscious processes. For example, Deci and Ryan's (1985) self-determination theory posits that *intrinsically motivated* behaviors (i.e., those that people engage in for their own sake because they are inherently pleasurable) and *extrinsically motivated* behaviors (i.e., those that people engage in to obtain some external reward or to avoid some negative outcome) have drastically different outcomes in terms of individuals' performance, creativity, well-being, and mental health (Deci & Ryan, 2000; Ratelle, Vallerand, Chantal, & Provencher, 2004; Ryan & Deci, 2000). Such distinctions seem to have all of the hallmarks of consciously derived beliefs, and indeed, the notion that autonomy is necessary for effective self-regulation is central to one of the mini-theories (i.e., cognitive evaluation theory) derived from self-determination theory. Yet, in a recent study by Levesque and Pelletier (2003), participants were nonconsciously primed with an intrinsic or extrinsic motivation through subtle exposure to words related to these motivations (e.g., intrinsic: "choice," "autonomy," "interest," "freedom"; versus extrinsic: "pressure," "obligated," "constrained," "forced.") Intriguingly, these goal primes were found to have precisely the same behavioral

outcomes as those of conscious intrinsic and extrinsic motivational states.

Similarly, the monitoring of goal progress of the sort that occurs in the discrepancy reduction model described by Carver and Scheier (1981) has been theorized to be able to proceed nonconsciously (Moscowitz, Li, & Kirk, 2002)—a proposal that garners support from recent evidence suggesting that people have awareness of the success or failure of nonconscious goal pursuits (see Leander, Moore & Chartrand, 2009). Moreover, there is now even evidence that the experience of self-agency and feelings of self-efficacy (i.e., the conscious belief that one has the mastery and ability to attain a desirable end state) may have nonconscious antecedents (Aarts, Custers, & Marien, 2009; Chartrand, Dalton, & Cheng, 2008).

In summary, then, work in social cognition during the past 15 years has demonstrated that consciousness appears not to be a necessary feature of goal pursuit. People can evidently strive toward an endpoint of which they may be largely unaware. But, how strong is the evidence that participants are unaware of these end states? We consider some critical questions on this point in the next section.

### **Decomposition of Consciousness: Questions about What and When**

What are we talking about when we talk about a lack of consciousness during goal pursuit? In other words, what would it mean for a person to be engaging in goal pursuit without being aware of any goal-related thought, intention, or action? It makes sense to first consider what people typically consciously think about (i.e., are aware of) when they are knowingly engaged in goal pursuit. Research suggests that people may consciously think about the end state, the consequences of that end state, the circumstances and means of getting there, and the emotional implications of being successful or not (e.g., Bandura, 1986; Carver & Scheier, 1998; Deci & Ryan, 1985; Gollwitzer, 1990; Locke & Latham, 1990; see also Mischel, Cantor, & Feldman, 1996 for a review). There would thus seem to be great variety in the (conscious) mental content in the minds of people pursuing a goal intentionally. Such variety poses a potential challenge for research on nonconscious goal pursuit because it means that there is a lot of ground to cover in terms of showing what is *not* going through people's heads consciously. That is, it would seem necessary to show that people do not have any conscious thoughts (whether fully formed or vague) revolving around the end state, its

means, its implications, the relevant intentions, and emotional fall out from the pursuit.

To complicate matters even more, a goal does not inhabit an obviously discrete slice of time. To be sure, in order for the goal construct to make any sense conceptually, it has to be the case that someone *starts* being in a goal pursuit and then at some point *stops* being in the goal pursuit. But, such demarcations may exist primarily to aid in our folk psychological understanding of goal states, rather than accurately reflecting the fluctuations of cognition. When and where those boundaries are is not always obvious. For example, do *all* the myriad representations related to any given goal (e.g., achievement, fitness) have to uniformly decrease in accessibility for a goal pursuit to be inactive? And yet, even though it would appear to be a difficult task, it seems necessary for anyone estimating the consciousness of goal pursuit to consider whether awareness of the goal occurs in the lead-up to any pursuit, during the actual pursuit itself (which might be prolonged), and perhaps during the reflection and post mortem of that pursuit. This requires that any analysis of consciousness needs to be lengthy and expansive, as well as sensitively timed to a given person's presumably situation-specific goal trajectory.

As should be clear, the hurdles for concluding that goal pursuit can proceed without consciousness of that goal are impressive indeed. There are questions not only about the many nuances of goal-relevant conscious cognitions but also about the extent to which those cognitions appear over some temporal span. What evidence does the literature offer concerning these questions? The bulk of evidence in the literature on mindless motivation comes from funneled debriefing procedures in which participants are asked at the end of the experimental session a series of increasingly specific questions about the nature and purpose of the experiment (Bargh & Chartrand, 2000). Participants are asked whether they noticed anything strange or unusual about the experiment, whether they saw a connection between the various different tasks in the experiment, and whether they know the purpose of the experiment. Participants typically report not knowing or seeing any connection between the part of the experiment in which the goal was primed and the part of the experiment in which their behavior was measured, as well as not knowing the purpose of the experiment, and researchers have taken this evidence to mean that participants were unaware of the goal.

There is a critically important difference, however, between knowing how and when a goal was

activated and knowing *that* a goal was active, and researchers in this area are arguably more interested in the latter (see Uhlmann, Pizarro, & Bloom, 2008). To test this, one could measure whether participants who have been nonconsciously primed with a goal report more concern with, or importance of, the goal, compared with participants who have not been primed. Several papers show that this is not the case (Aarts et al., 2004; Eitam, Hassin, & Schul, 2008; Ferguson, 2008). This qualifies as stronger evidence that participants who are implicitly primed with a goal do not seem to have awareness of that goal's operation. There is also the evidence mentioned earlier from Bargh et al. (2001; Study 3), wherein participants' consciously reported goal-strength was correlated with their motivated behavior only when the goal was primed consciously, not when the goal was primed nonconsciously (see also Hassin, Bargh, & Zimmerman, 2009).

Another general problem with the debriefing method of testing awareness, however, is that it is a self-report, which means that it is susceptible to participants' strategic editing and modification; for example, participants may not want to report—for whatever reason—that they were concerned with a particular goal in the experiment. Additionally, and importantly, these debriefing procedures are also administered at the very end of the experiment, and as such face the same problems as any retrospective measure of memory. A person's awareness can be momentary, and not survive long enough to allow introspection at some later point. What seems necessary for testing awareness, then, is to implement measures of awareness throughout a given experiment, in various ways that minimize the reactive nature of self-reports. This will be a challenge for future research to address.

### **Dispelling the Conscious/Nonconscious Dichotomy**

Throughout the past 15 years, goal pursuit has been described as conscious or nonconscious, and there are a couple problems with this kind of conceptualization. The first, as we mentioned above, is that the evidence for a lack of awareness is still accumulating and does not yet afford a full understanding of exactly when and how goal pursuit proceeds completely without consciousness. Second, and perhaps even more importantly, this duality is probably just as ill posed as are many other dualities in human cognition. Given that goal pursuit is (or can be) a complicated, flexible, multistage, and multi-step process of behaviors unfolding, it would seem

to make more sense to ask where and when consciousness arises. In this section, we review recent evidence of some aspects of conscious goal pursuit that operate relatively nonconsciously, and similarly, aspects of nonconscious goal pursuit that appear to be available to conscious awareness. In the following section, we then address the circumstances under which consciousness might be functional.

### ***Aspects of Conscious Goal Pursuit that Operate Nonconsciously***

Recent theories in motivation have pointed to the relatively limited capacity of conscious processing to suggest that if goal pursuit is to be successful, it should be bolstered by less resource-intensive nonconscious processes, thus freeing up consciousness for other higher order operations (e.g., Bargh, 1990; Custers & Aarts, 2010). Considerable evidence now shows that the conscious adoption of a goal can set into motion a number of nonconscious processes that are largely automatic and unintentional, but may nonetheless ultimately serve to facilitate attainment of the conscious goal. There are effects on perception, knowledge accessibility, attention, and evaluation.

#### **PERCEPTION**

The notion that our current motivations may have a top-down influence on what we perceive was the subject of the New Look program of research of the 1950s. Theorists involved in this movement claimed that perception was not a veridical representation of the external world but was rather a construction of the mind that could be influenced by one's internal desires, beliefs, needs, and so forth. Researchers thus attempted to uncover evidence that people with different needs or desires exhibited important differences in their perceptions of the external world. Bruner and Goodman (1947) famously found, for example, that children who come from relatively poverty-stricken socioeconomic backgrounds overestimate the size of coins relative to children coming from more economically advantaged backgrounds, presumably because poorer children place a higher value in money than more affluent children and thus have a greater motivation to obtain it.

Although these early demonstrations were marred by conceptual and methodological difficulties (Eriksen, 1958, 1962; Eriksen & Browne, 1956; Goldiamond, 1958; Prentice, 1958; Wohlwill, 1966), a contemporary re-examination of the main tenets of the New Look movement has breathed

new life into research on motivated perception. In a recent set of studies, Balci and Dunning (2006) found evidence to suggest that we, quite literally, “see what we want to see”—that our current goals have a strong influence on perception, particularly when visual stimuli are ambiguous. In one study, participants were led to believe that they would be randomly assigned, in an upcoming taste test, to sample either freshly squeezed orange juice or a rather foul-smelling and putrid garden smoothie that was intentionally designed to be especially undesirable to participants. They were told that the computer would randomly assign them a beverage and would indicate this condition assignment by displaying either a number or a letter (and whether a number or letter represented a positive or negative outcome was randomly assigned). Unknown to participants, the visual stimulus that was displayed was ambiguous and could be interpreted either as the letter “B” or, alternatively, as the number “13.” After briefly displaying this ambiguous figure, the computer ostensibly crashed, and participants were asked to report what they had seen on the screen directly before the crash occurred. Consistent with the notion that our current wants can influence perception, participants were more likely to report seeing whatever stimulus would allow them to taste the orange juice rather than the garden smoothie. Subsequent studies served to eliminate various alternative explanations of the results—including that participants were simply lying about what they saw in order to avoid a negative outcome. Thus, one’s conscious goal of avoiding an unpleasant experience had an unintentional consequence on the basic, low-level perception of ambiguous visual stimuli, suggesting that conscious goal pursuit can have unintended nonconscious consequences, particularly in a readiness to interpret one’s environment in ways that are consistent with one’s goals.

#### ATTENTION

Besides having an influence on our perception of objects in our immediate environment, goals have also been posited to influence what we pay attention to in our environment. Once a goal becomes activated, knowledge that is related to the goal is made accessible through spreading activation, which can then lead to a kind of perceptual readiness to process concepts and ideas related to the goal that can unintentionally grab attention.

In an empirical investigation of this idea, Moscovitz (2002) examined how the priming of a goal influenced the likelihood of goal-relevant

distractors grabbing individuals’ attention. In the first part of the experiment, a goal to attain a high level of athletic performance was activated by having people think about a recent failure to attain an athletic standard. According to self-completion theory (Wicklund & Gollwitzer, 1982), such consideration of recent failures motivates individuals to strive to reattain the standard, resulting in the activation of a goal. Two control groups were also used in which the athletic goal was not activated: in the first, participants were asked to recall a recent athletic success that was thought to signal to the participant that they were making good progress toward the goal, whereas in the second, subjects were simply asked to recall nothing at all. Next, all participants then completed a task in which distractors were presented on-screen that were either goal related or not. To complete the task efficiently, participants needed to ignore these distractors and instead focus on the target information presented on the screen. However, the results demonstrated that those who had had an athletic goal activated were slower on the task than controls when the distractors were goal relevant. No such disparity emerged when the distractors were unrelated to the athletic goal, suggesting that when the goal was activated, attention was automatically directed toward the goal-related information when it was present in the environment.

Aarts, Dijksterhuis, and DeVries (2001) similarly found evidence for this kind of perceptual readiness to identify and pay attention to goal-relevant stimuli in one’s environment. In one study, some participants were made thirsty by asking them to consume some salty snacks and not permitting them to drink any water, whereas other participants were sated by allowing them to quench their thirst before moving on to the next task. This manipulation was found to influence the accessibility of drinking-related (but not neutral) words on a lexical decision task, demonstrating that the experience of thirst had rendered concepts related to thirst more accessible. In a second study, participants who were thirsty were shown to pay more attention to thirst-related objects in their environment. Participants’ thirst was manipulated using the same method as the first study, and participants again completed a lexical decision task. In the room where they completed this task, there were a number of drinking-related objects, such as a water bottle sitting on the desk. In a surprise recall task presented after completing the computer task, participants who were thirsty recalled more drinking-related objects than participants who



were sated, but there were no differences in recall of non-thirst-related objects.

Taken together, these studies demonstrate that the conscious adoption of a goal can have unintended consequences for the accessibility of knowledge related to the goal and for where attention is directed in one's environment, as has been argued by various scholars (e.g., Bruner, 1957). This is likely to be an adaptive, though unintended, consequence of consciously adopting a goal. After all, to exploit opportunities in one's environment to engage in goal-directed behavior, one must first determine what those opportunities are. By fostering a kind of perceptual readiness to find goal-relevant opportunities in one's environment and direct attention toward them, one thus has a better chance of taking advantage of them while they are still available.

#### ATTITUDES AND EVALUATION

Evidence has accumulated in recent years that when people consciously adopt a goal, they rapidly and spontaneously evaluate goal-relevant objects in their environment significantly more positively than immediately after having met the goal (Ferguson, 2008; Ferguson & Bargh, 2004; Ferguson & Wojnowicz, 2011; Myrseth, Fishbach, & Trope, 2009; Natanzon & Ferguson, 2011; Payne, McClernon, & Dobbins, 2007; Seibt et al., 2007; Sherman et al., 2003; see also Brendl, 2001; Brendl, Markman, & Messner, 2003; Fishbach, Zhang, & Trope, 2010; Moors & De Houwer, 2001; Moors, De Houwer, Hermans, & Eelen, 2005). For example, in one demonstration (Ferguson & Bargh, 2004, Study 2), participants were made thirsty by not drinking for several hours before arriving for their scheduled experimental session. Some participants were then allowed to quench their thirst by drinking a beverage before moving on, whereas others were made even thirstier by eating a number of salty pretzels. The results showed that thirsty participants evaluated thirst-related words significantly more positively in a subsequent affective priming task (see Fazio et al., 1995) than participants who had their thirst sated, but no differences emerged on non-goal-relevant words. In other words, goal-relevant knowledge is not only made more accessible during goal pursuit; it is also rendered temporarily more positive.

Importantly, these shifts in the evaluation of goal-relevant knowledge are thought to be functional in that they encourage individuals to engage in relatively automatic behaviors that foster goal attainment. Indeed, there is a wealth of evidence

showing that implicit attitudes and evaluation are predictive of subsequent behavior (e.g., for a review, see Wittenbrink & Schwarz, 2007). Chen and Bargh (1999), for example, have shown that implicit positivity toward objects fosters relatively automatic approach behaviors, whereas implicit negativity toward objects fosters relatively automatic avoidance behaviors. Moreover, Custers and Aarts (2005) demonstrated that artificially induced implicit positivity toward an activity results in increased motivation to engage in it. Thus, the conscious adoption of a goal can have unintended implicit effects on behavior, which are mediated by shifts in one's (implicit) evaluations of goal-related stimuli.

Interestingly, these effects on our evaluations of goal-relevant stimuli might also have unintended influences on our evaluations of other people, even when those evaluations are not related to the actual goal being pursued. In a recent study (Bargh, Green, & Fitzsimons, 2008), participants were told that they would be evaluating a job candidate in terms of suitability for either a position as a waiter or a position as a journalist (jobs chosen on the basis of a pretest that demonstrated that people believed to require markedly different personality traits, with waiters being selected primarily on the basis of their politeness and journalists being selected primarily on the basis of their ability to be tough and aggressive in order to get to the bottom of a story). To assess the job candidate, participants watched a videotape of an ostensible interview being conducted. At several points during the interview, the interviewer was interrupted by other people from the office, mimicking a busy office setting.

One of the interrupters, "Mike," inquired about lunch plans with the interviewer. Actually a trained actor hired by the research team, Mike acted either politely or aggressively in response to the interviewer's comment that he would have to skip lunch. When the tape had concluded, participants were told that the experiment actually concerned their thoughts about Mike and were asked to rate how much they liked him on a self-report scale. Interestingly, even though Mike was not the intended target of the conscious goal to evaluate the job candidate, this goal systematically influenced people's ratings of him. When they thought the interview was for a waiter position, they liked Mike better when he was polite, but when they thought that the interview was for a journalism position, participants liked Mike more when he was rude and aggressive. The authors' interpretation of these findings was that the adoption of the conscious goal to

evaluate the job candidate set in motion a number of implicit processes that were then unintentionally applied to an irrelevant target. Thus, a conscious goal engaged a nonconscious process that had an unintended influence on subsequent evaluation.

### *Aspects of Nonconscious Goal Pursuit that Seep into Consciousness*

Not only does the conscious adoption of a goal have unintended, implicit effects, it is also the case that the nonconscious activation of a goal can lead to downstream effects that are conscious. That is, aspects of nonconscious goal pursuit may seep into conscious awareness, and this eruption into consciousness may have important influences on the continued operation of the goal, or on subsequent goal pursuits that are adopted after the momentary awareness subsides.

#### **AWARENESS OF SUCCESS AND FAILURE**

In an interesting set of experiments, Chartrand (2007) found that success or failure at a nonconscious goal pursuit can influence one's mood. In one study, experimental (but not control) participants were first primed with an achievement goal by completing a scrambled sentence task, and then all were led to succeed or fail at this goal during a subsequent anagram task. In the easy condition, participants were led to expect that the task would take eight minutes to complete when it actually took an average of two minutes. By contrast, in the difficult condition, participants were led to believe that the task would take two minutes to complete when it actually took an average of eight minutes. Participants were then allowed to work on the task for as long as they wanted. However, because of the differing expectations for the task, participants in the easy condition were led to have a subjective experience of success in attaining the achievement goal, whereas participants in the difficult condition were led to have a subjective experience of failure to meet the goal. After completing the anagram task, participants completed a self-report questionnaire assessing their current mood. Although participants had no awareness in a funneled debriefing of the achievement goal having been activated, there were nonetheless systematic differences in participants' self-reported mood: those for whom the achievement goal had been activated were in a better mood in the easy condition in which they completed the anagrams within the expected amount of time than if they were in the difficult condition in which they did not. No such differences were found for

participants in the control condition, suggesting that it was the success or failure to meet the nonconsciously activated goal that caused the mood differences rather than some aspect of the anagram task itself.

In a second study, the mood differences caused by the outcome of a nonconscious goal pursuit were compared with those caused by a conscious goal. Some participants were given a conscious goal to form an impression of a target individual, whereas others were primed with a nonconscious impression formation goal, and still others were given no goal at all (controls). Participants were then led to fail at this goal by making the task of forming an impression of the target individual either easy or difficult. Although there were no mood effects in the control condition, participants with either a conscious or nonconscious goal were in a better mood if they succeeded in achieving this goal, and importantly, there were no differences between the conscious and nonconscious goal conditions with respect to these mood effects.

Of course, there was one particularly important difference between the conscious and nonconscious goal conditions in this study: although participants could easily determine the cause of their mood when they were aware of the goal they were pursuing, participants lacked insight into the cause of a mood that originated from a nonconscious goal pursuit. Chartrand (2007) has found that this lack of insight has important implications for subsequent behavior, leading participants to misattribute their negative mood to salient aspects of their environment, to be more likely to engage in self-enhancement, and even to have a greater propensity to act aggressively (see Chartrand, Dalton, & Cheng, 2008). Oettingen and colleagues (Oettingen et al., 2006) have similarly proposed that the absence of conscious awareness of the source of one's nonconsciously derived goal-directed behaviors results in a kind of "explanatory vacuum" in which participants are left without a ready explanation for their actions. To the extent that there is no plausible explanation that one can latch onto in one's environment (e.g., when one's behavior violates a salient social norm), this may result in the (conscious) experience of negative affect.

Leander and colleagues (2009) have proposed that such mood effects are also likely to have effects on subsequent self-regulatory efforts. This is thought to occur in at least two ways. The first is that because the unexplained mood that results from a previous nonconscious goal pursuit is likely to be attributed

to a consciously available target, one may falsely attribute one's current mood to another of one's (consciously available) current goal pursuits rather than the true source. This may then subsequently influence one's self-regulatory efforts with respect to that goal, perhaps by reducing commitment to the goal or changing strategies. The second way is that a consciously experienced mystery mood might encourage us to adopt new goals: perhaps mood repair (in the case of a failed nonconscious goal) or perhaps mood maintenance (in the case of a successful nonconscious goal), and these newly adopted goals can then influence subsequent self-regulatory behavior in predictable ways.

One's subsequent performance might also be similarly affected by nonconscious goal pursuits. Chartrand (2007) found evidence to suggest that success or failure at a nonconscious goal had performance effects that mimicked those of a consciously adopted goal: participants who were led to fail at a goal had lesser expectations about their likely performance on a subsequent test of ability (i.e., difficult GRE questions), whereas participants who were led to succeed had relatively higher expectations for their upcoming performance. Such increments and deficits in performance after the failure or success of a consciously adopted goal have been explained in terms of changes in one's self-efficacy beliefs (Bandura, 1997; Locke & Latham, 2002)—that is, those who fail at a goal suffer a hit to their perceived ability to meet their goals more generally, which is thought to have an important influence on one's beliefs about future performance. Interestingly, Chartrand (2007) found evidence to suggest that changes in performance resulting from a failure or success at a nonconsciously activated goal were also mediated by changes in (conscious) feelings of self-efficacy. Those who recently succeeded at a nonconscious goal pursuit were shown to have higher expectations of their performance on a subsequent task, and this ultimately led them to actually perform better, whereas those who recently failed at a nonconscious goal pursuit had relatively lower expectations for their performance, resulting in actual performance deficits.

In summary, although nonconscious goals can and often do operate to completion without any conscious awareness or intention, the success or failure of these goals appears to be consciously accessible, leading to systematic influences on one's current mood and feelings of self-efficacy. Importantly, moods resulting from performance on a nonconscious goal are thought to have an

influence on subsequent behaviors, suggesting that this conscious experience may be causally related to subsequent motivated behavior, either by exerting an influence on the conscious goals that we choose to adopt or abandon, or by encouraging us to adopt new goals that may influence subsequent behavior (such as mood maintenance or mood repair goals), or perhaps even by altering conscious perceptions of self-efficacy that encourage or discourage the exertion of effort on subsequent goal-relevant tasks.

#### PRESCRIPTIONS OF SELF-AGENCY

Another conscious experience that appears to have nonconscious antecedents is the subjective experience of having caused one's actions or behaviors—that is, the experience of self-agency. Aarts, Custers, and Marien (2009) have proposed that the experience of agency arises from a match between the activation of a representation in memory of a particular outcome—say, having moved one's arm one inch to the left—and the actual outcome that is produced—that is, of having actually moved one's arm one inch to the left. In other words, situations in which one experiences a particular outcome at a time when it is currently primed in one's mind engender feelings of having brought about the outcome. Importantly, however, this process can occur independent of whether one *has* actually intentionally caused the outcome. In situations in which the outcome representation happens to be primed at a time when the outcome also occurs, people have a tendency to attribute the cause of these outcomes to their own agency, even if this belief is spurious.

In a series of studies, Aarts and colleagues asked participants to perform a behavior (e.g., to press a key on a keyboard that stopped a rapidly alternating set of squares on a particular colored square) that resulted in an outcome that could either have been caused by the participant's actions (i.e., from hitting the key) or randomly determined by the computer irrespective of the participant's actions. After each outcome, participants were asked to rate the extent to which they believed they had caused it rather than it being randomly determined. In reality, the outcome was always determined by the computer, so any perceptions of self-agency were fallacious and entirely based on individuals' subjective experience. Unknown to participants, they were sometimes subliminally primed with a particular outcome (e.g., "purple," indicating an upcoming stop on the purple square) before it occurred. Consistent with the hypothesis, when participants were primed with the outcome just before it occurred, they reported

a greater experience of self-agency in bringing about the outcome than if they hadn't been primed. Importantly, this only occurred when the prime occurred immediately before the outcome (i.e., one second), but not if there was a greater time lag (i.e., 20 seconds), indicating that the concept needed to be activated at the time that the outcome occurred in order to have any influence on feelings of self-agency (see Wegner & Wheatley, 1999).

This result suggests that self-agency may have nonconscious antecedents—but is there evidence that the satisfaction of a nonconscious goal, in particular, can result in conscious feelings of agency? In a follow-up experiment, Aarts and colleagues essentially manufactured a nonconscious goal to achieve a particular outcome by closely pairing it with positively valenced words (e.g., “puppy,” “sunshine.”) Such pairings have been shown in previous research to foster relatively automatic approach behaviors and have been theorized to be an avenue through which nonconscious goals acquire their motivational significance (Custers & Aarts, 2005). In the current experiment, when the outcome was paired with positive affect, participants reported a greater sense of self-agency when they were primed with the concept, even after a significant time lag (20 seconds). This result is consistent with the evidence discussed earlier that suggests that, in contrast to semantic priming, which has been shown to have a particular steep decay function, a nonconscious goal remains activated until it is satisfied (see Bargh et al., 2001). These results thus provide evidence that the activation and subsequent satisfaction of a nonconscious goal may result in a greater conscious experience of self-agency, providing additional support for the contention that the outcome of a nonconscious goal pursuit has an influence on one's conscious experience.

### Functional Role of Consciousness

Given evidence that goal pursuit can seemingly operate largely without awareness, some have questioned whether consciousness makes any significant contribution whatsoever to goal pursuit and self-regulation. Bargh, for example, in his conception of the “selfish goal” (Bargh & Huang, 2009; see also Bargh, Green & Fitzsimons, 2008; Huang & Bargh, 2011)—a play on Richard Dawkins' 1976 bestseller *The Selfish Gene*, in which genes were posited to be the unit of natural selection rather than the organisms that hosted them—extricates the individual from the process of behavioral selection altogether, instead positing that goals, once

activated, selfishly operate to completion irrespective of the costs or benefits of this operation to their host. Under this conception, consciousness is unneeded and inconsequential.

Certainly, we have noted the benefits of a motivational system that can run unconsciously. Given the processing and capacity limitations of consciousness, meeting our motivational demands—much less being able to multitask—in a solely conscious manner would be highly inefficient. Instead, staying nonconsciously attuned and responsive to the possibly rewarding future routes of behavior suggested by the environment would seem highly functional and critically necessary. In addition, recent work shows that people seem to commence nonconscious goal pursuits only when those pursuits are desirable, self-relevant, and context appropriate (see Aarts et al., 2004; Ferguson, 2008), demonstrating that people pursue nonconscious goals in a functionally selective (not indiscriminate) manner.

So, is consciousness completely useless for goal pursuit? Does it offer any benefits? In this section, we consider contemporary theories of consciousness in social cognition and cognitive psychology and speculate about ways in which conscious thought may serve to facilitate subsequent goal-directed behavior. We consider whether consciousness might contribute to sequential planning, troubleshoot nonconscious goal pursuits that encounter obstacles or unexpected failures, and engender transcendence of the here-and-now through a unique ability to simulate the past and future, all of which may fundamentally alter the goals that we choose to pursue and the means that we adopt to pursue them.

### Sequential Planning

Although consciousness is known for its exceedingly limited information processing capacity in comparison to the overwhelming parallelism achieved by the unconscious (e.g., Dijksterhuis & Nordgren, 2006), a number of researchers have suggested that conscious thought may be necessary for some subset of information processing tasks that are perhaps outside of the jurisdiction of nonconscious processes (e.g., Baumeister & Masicampo, 2010; Dehaene & Naccache, 2001; Hofmann & Wilson, 2010). One proposal is that conscious thought may be required in the novel processing of information, particularly in the construction of meaningful and novel sequences of thought extrapolated from one's existing knowledge. Although nonconscious processes appear to be especially good at managing a large volume of well-learned and heavily entrenched

associations, some scholars have argued that consciousness appears to be needed to take existing information and process it in new, unique ways, as is likely necessary in language and speech construction, counting and quantification, and logical reasoning, among other abilities (Baumeister & Masicampo, 2010).

The evidence on this front is still accumulating, but recent work challenges the notion that consciousness is required for these sorts of tasks. First, although earlier studies suggested that simple two-word phrases (e.g., “kill enemy”; Greenwald & Liu, 1985) cannot be meaningfully parsed and nonconsciously evaluated (see also Mackay, 1973), more recent work shows that negations (e.g., “no sunshine” should be less positive than “sunshine”) can in fact be processed and evaluated in a rapid and unintentional manner (see Deutsch, Kordts-Freudinger, Gawronski, & Strack, 2009; see also Deutsch, Gawronski, & Strack, 2006; Draine, 1997). These findings show that such negation seems to depend on working memory, which itself has recently been characterized as being able to operate without awareness (see Hassin, Bargh, & Zimmerman, 2006; Hassin, Bargh, Engell, & McCulloch, 2009). Even more importantly, recent work shows that when consciousness can be withheld (for roughly 2 seconds) from the processing of complex stimuli through the use of the method of Continuous Flash Suppression, people nevertheless solve simple subtraction (e.g., “5 - 7 - 2”) and addition problems, and read multi-word phrases (see Sklar, Levy, Goldstein, Mandel, Maril, & Hassin, 2012; see also Hassin, in press).

It also should be noted that although the complexity (or lack thereof) of information that can be visually or aurally processed without awareness may address limits on the amount of information we can process subliminally, or within very short temporal windows, it does not necessarily speak to the sophistication of nonconscious processing more generally. There are many examples in which information that is consciously attended to is then parsed, interpreted, and combined in impressively sophisticated—yet nonconscious—ways. One example would be implicit learning (e.g., see Frensch & Runger, 2003 for a review), whereby people attend to sequences of cues consciously, and yet grasp the rules connecting those stimuli only nonconsciously. Or, another example is reading: a process that (sometimes but not always; see Sklar et al., 2012) involves conscious attention to sequences of words, but a decidedly

*nonconscious* integration and interpretation of those words.

With respect to the processing of relatively *novel* information, however, there is neurological evidence that suggests that consciousness likely has an important role to play. Raichle et al. (1994), for example, found that activation of the prefrontal cortex and anterior cingulate—areas often activated when conscious control is necessary (Dehaene & Naccache, 2001)—occurs first during initial exposure to a task when novel processing is required, then slowly declines over time as the activity becomes more routinized, but then quickly rebounds to full activation if novel information is presented. This suggests that although nonconscious processes operate quite well on previously considered and well-established information and associations, they may be ~~less apt to process~~ novel stimuli (though see Eitam et al., 2007).

One implication of the claim that consciousness may be required for processing novel stimuli is that consciousness may play a central role in planning. Baumeister and Masicampo (2010) argue, for example, that even the simple act of successfully catching a flight is likely to rely on conscious sequential processing, beginning with the flight’s departure time and working backward through the series of events that we know are likely to take place in order to arrive at an appropriate time to commence the sequence of actions. Successful goal pursuit is not merely about exploiting opportunities that present themselves in one’s environment but also about anticipating and planning for particular contingencies that may present themselves in the future—operations that conscious thought may be particularly well suited to accomplish.

Furthermore, a plan of action may be especially necessary when one adopts a goal for the first time. Although many chronic, long-term goal pursuits can rely on the relative success or failure of past attempts to inform current pursuits, new goal pursuits are especially likely to require the kinds of novel, sequential processing of information at which conscious thought may excel. Similarly, conscious thought may also play a role in the derivation of plans when attempting to effectively juggle multiple goal pursuits—that is, in adaptively prioritizing goals in ways that allow us to make sufficient progress on as many of our aspirations as possible. Such prioritizations are likely to require both an assessment of the feasibility of obtaining a goal right now and an assessment (i.e., the anticipation and prediction) of the feasibility of obtaining the goal

later in the future—assessments that are likely to require not only sequential planning but also the ability to simulate future consequences which may (or may not; see Fukukura, Helzer, & Ferguson, in press) require consciousness.

Importantly, once a plan has been consciously derived and the sequential steps required to attain the goal have been determined, conscious thought may no longer need to be recruited to actually implement the strategy. Indeed, the most efficient and effective way for goal pursuit to proceed may be in the conscious derivation of a sequential plan of action followed by the subsequent nonconscious implementation of the strategy. Gollwitzer's extensive program of research on implementation intentions (i.e., if-then contingencies for goal pursuit) supports this contention (see Parks-Stamm & Gollwitzer, 2009, for a review). Numerous studies have shown that when individuals consciously consider the goal-directed behaviors that they might engage in when certain situational cues present themselves (i.e., they derive a plan of action to be executed given a particular set of environmental constraints, e.g. "If I get home early from work, I will go for a run"), they are significantly more likely to achieve their goals. For example, Gollwitzer and Brandstätter (1997) found that when participants had formed an implementation intention for a difficult personal project that they wanted to accomplish over the Christmas break, they were three times more likely to accomplish the goal than if they hadn't formed one. Importantly, Brandstätter and colleagues (2001) found evidence to suggest that once an implementation intention has been derived, the goal-directed action (i.e., the "then" part of the if-then statement) acquires features of automaticity, meaning that its actual implementation can proceed with relatively little further conscious intention or awareness when the appropriate environment conditions are present. Thus, planning may serve to facilitate a kind of "strategic automaticity" in which an intention serves to create or modify the automatic associations that foster the relatively nonconscious pursuit of the goal.

### ***Consciousness as a Troubleshooting Device***

Anyone who has ever faced a road closure on a preferred morning route to work has likely experienced a (formerly nonconscious) goal pursuit rather abruptly making its way into consciousness. This is an interesting observation because it suggests that there are indeed times when our nonconscious goals may become available to conscious awareness, and

the times when this occurs may offer clues as to when consciousness may be a useful tool in furthering progress on our goals. One long-standing suggestion (see Arievitch & Van Der Veer, 2004, for a historical review; see also Bongers & Dijksterhuis, 2009; Gollwitzer, Parks-Stamm, & Oettingen, 2010) that has garnered recent empirical support (Bongers, Dijksterhuis, & Spears, 2010) is that consciousness might be seen as a kind of troubleshooting device that comes to the aid of nonconscious processes when those processes fail or encounter an impasse. When nonconsciously activated goals are proceeding smoothly, consciousness is rather superfluous to self-regulation; after all, if one is making good progress without conscious intervention, then the exceedingly limited capacity and resources of consciousness might be more adaptively directed toward other endeavors. However, when nonconscious goal pursuit encounters difficulties, the goal is more likely to become available to conscious awareness. Importantly, this eruption into awareness has been proposed, at least under certain circumstances, to be adaptive (see Arievitch & Van Der Veer, 2004; Gollwitzer, Parks-Stamm, & Oettingen, 2010) in that it allows us to properly interpret our behavior and the resulting outcome and consciously derive new strategies to overcome the impasse (e.g., to simulate a new route to work, given that the road closure has made the typical route impossible).

### **AFTER FAILURES**

The notion that frustrated or incomplete goals are more likely to be consciously mulled over has enjoyed a long history in psychology. For example, early explorations of the idea demonstrated that when people are asked to recall a series of tasks that they have worked on during an experimental session, they are considerably more likely to recall the tasks that were not completed (Ziegarnik, 1938). Similarly, Martin and Tesser (1996) posit that frustrated or incomplete goals are more likely to unintentionally intrude into consciousness, and these intrusions are thought to continue to occur until some resolution is achieved, either by meeting the goal or by choosing to abandon it.

In a recent set of studies, Bongers, Dijksterhuis, and Spears (2010) sought evidence for the notion that frustrated nonconscious goals are likely to seep into conscious awareness. In one study (Bongers, Dijksterhuis, Spears, 2010, Study 1), participants were first subliminally primed with either an achievement goal or not and then subsequently asked to complete a memory game in which they

had to identify matching pairs of cards by flipping two cards at a time. Some participants were allowed to satisfy the primed goal by being given sufficient time to complete the memory game (12 minutes). Others saw their achievement goal frustrated by being given a very short amount of time to complete the task (only 3 minutes, which was insufficient to identify all matching pairs). In the primary dependent measure, participants did a sentence completion task (e.g., “I...”, “I am...”, “I wished...”, “The memory game...”, etc.) that was meant to tap into their current conscious thoughts. Results revealed that participants who were primed with an achievement goal but had their goal frustrated in the memory game had significantly more conscious achievement goal-related sentence completions than participants in any of the other three conditions.

Of course, one might argue that the dependent measure in this first study tapped activation of the goal rather than conscious thought. Thus, in a second study, participants were once again primed with an achievement goal, and then had this goal frustrated (or not) by being asked to complete a version of the Remote Associates Test (Mednick, 1962) that was either difficult or easy to complete. While completing the test, participants were asked to report their online conscious thoughts by thinking out loud, with the number of goal-relevant thoughts serving as the primary dependent measure. Results once again suggested that participants for whom an achievement goal was primed but then frustrated were more likely to have goal-relevant thoughts while thinking aloud.

These studies provide empirical support for the notion that frustrated nonconscious goal pursuits are more likely to intrude into consciousness. But is there any evidence that such intrusions are adaptive? It is compelling to conclude that an eruption into consciousness may serve a regulatory function, allowing consciousness to perhaps alter the course of self-regulatory efforts in order to overcome the difficulty (Arievitch & Van Der Veer, 2004; Gollwitzer et al., 2010). However, as Bongers, Dijksterhuis, and Spears (2010) point out, there are likely to be a number of important moderators at play with respect to whether such intrusions are adaptive. The relative difficulty of overcoming the existing obstacle may be one such moderator. Bandura (1997) has shown that motivation is a product of expectancies about both the desirability and feasibility of attainment of a possible end state. To the extent that conscious awareness of a failed nonconscious goal pursuit is

perceived to be indicative of low feasibility of goal attainment, people may just as soon reduce effort or abandon the goal rather than seek new ways to pursue it. Of course, goal disengagement in these contexts might, under some circumstances, be adaptive in that one might consciously determine that one's efforts are better spent on other pursuits. It remains to be seen whether intrusions into consciousness of this sort are generally beneficial or more often detrimental to self-regulation. Nonetheless, these recent studies hint at the possibility that consciousness may be well suited to a troubleshooting role in self-regulation and serve as an important platform for future research.

#### **WHEN REGULAR MEANS OF PURSUIT BECOME INVALID**

Another situation in which nonconscious goal pursuit is likely to be frustrated occurs in situations in which the typical means of pursuing a goal are no longer viable. For example, when one's immediate environment changes, such as when one is traveling away from home on business, the usual means of pursuing a goal (e.g., stopping at the gym on the way home from work) must be temporarily abandoned, and new means to goal attainment must be derived (e.g., making use of the hotel gym facilities in between meetings). In such situations, we might expect that, in much the way that frustrated goals seep into conscious, so, too, do goals for which the regularly adopted means become untenable.

One might conceive of this claim as essentially an extension of the argument that consciousness is required in sequential planning. In much the way that consciousness may contribute to meaningful and novel sequences of thought when deriving plans of action before the initiation of goal pursuit, the self-regulatory apparatus may similarly rely on these planning faculties when the current plan is no longer viable or appears to be unsuccessful. It should be noted, however, that the claim here is not that it will always be the case that consciousness will be required when a typical means of goal pursuit becomes untenable. These situations represent points at which a new plan of action may need to be developed in order to further goal pursuit, but to the extent that an alternative plan is readily available in the current environment, consciousness need not be recruited to adopt it. The findings of Hassin, Bargh, and Zimmerman (2008) on the relative flexibility of nonconscious goal pursuit speak to this assertion. In one study, participants were nonconsciously primed with an achievement

goal (or not) and then completed a variant of the Iowa Gambling Task in which they drew cards from one of four piles that resulted in them either gaining or losing a small or large amount of money. Unknown to participants, two of the decks were “bad” in that they had negative expected values, whereas two of the decks were “good” in that they have positive expected values. The usual result using such paradigms is that participants implicitly learn which decks are good and which are bad. However, also unknown to participants, in Hassin and colleagues’ experiment, the locations of the four decks were altered halfway through the experiment, such that what was once a “good” deck may have abruptly become a “bad” deck, and vice versa. The hypothesis of interest was that people nonconsciously primed with an achievement goal would be more flexible in their goal pursuit and switch decks once they were no longer achieving the desired ends. Consistent with this hypothesis, participants primed with achievement gave up more quickly on the newly created “bad” decks, and switched more quickly to the newly created “good” decks than control participants. In other words, when the current strategy was no longer valid, a nonconsciously activated achievement goal led participants to adapt more quickly to the new circumstances, and consciousness was unnecessary in promoting this flexibility. However, it should be noted that in these experiments, the behavior that was necessary once the old strategy became invalid was readily available (i.e., attempting to sample more frequently from the other decks) to participants and thus did not require any conscious intervention to derive. It remains to be seen whether nonconscious goal pursuit is similarly flexible in situations in which the new strategy or means of goal pursuit is not so readily available.

An important implication of the results of these studies is that consciousness may not be necessary if any of one’s preferred means are readily available in the current environment. For example, if we often pursue our fitness goals through a combination of running on a treadmill and playing basketball (and both are considered to be equally effective in meeting the goal), then the breaking of the treadmill during a particularly intense running session may not necessarily result in the recruitment of conscious planning strategies if one still has an opportunity to play basketball at the times when one might have run on the treadmill. Rather, it will likely only be in situations in which a new plan or alternative means is not readily available for pursuit, thus making the

sequential planning faculties of consciousness likely to be beneficial.

In summary, conscious sequential planning may be beneficial not only when one first adopts a goal but also in the midst of goal pursuit if a means that was previously effective becomes untenable. In line with the findings of Bongers, Dijksterhuis, and Spears (2010), we would expect that when a preferred means of goal pursuit is unavailable, a nonconscious goal will be more likely to seep into conscious awareness, and that this eruption into conscious awareness may be adaptive in that it allows for the development of a new, more effective plan for attaining the goal.

#### WHEN GOALS CONFLICT

Nonconscious goal pursuit may also be likely to seep into conscious awareness when we hold multiple conflicting goals. Although much of the early (and even more recent) goals literature largely focused on the activation and operation of single goals (but see Fishbach & Ferguson, 2007, for a review of recent exceptions), we know quite well that we often attempt to juggle many different goals at any one time, and that these goals can often require diametrically opposed behaviors in order to achieve them (e.g., a fitness goal that requires the purchase of expensive exercise equipment or a monthly gym membership and a financial goal that requires that we save our disposable income rather than spend it). Consciousness may be especially well suited to overcome such conflicts (see Morsella, 2005; Morsella, Krieger, & Bargh, 2009) by, for example, deriving a unique multifinal means (i.e., one which allows for both goals to be met simultaneously, e.g., the development of an exercise program that makes use of one’s own body weight for resistance so that expensive free weights are not required; see Kruganski et al., 2002), or by means of prioritization, perhaps by choosing to temporarily emphasize one goal over another, and then some time later reversing this emphasis so that sufficient progress can be made on each.

Interestingly, we know very little about *when* conflict will seep into the conscious mind. Recent work demonstrates that goal conflict can exist at a nonconscious level, with the conflict manifesting only in increased decision times, increased decision variance, and increased arousal (see Kleiman & Hassin, 2011). This work shows that conflict among one’s goals does seem to exist below our conscious radar, which raises the question of when—as well as whether—goal conflict enters awareness.



## Simulation

The very notion of a goal implies the realization of one (presumably desirable) future over many other (presumably less desirable) futures that might have occurred. But how is it that we determine precisely which futures we wish to bring about and which ones we do not? That is, how do we decide exactly which goals to adopt? Most of us have never won the lottery, yet we know that a future in which we are holding a comically oversized check while celebrating with a glass of champagne is likely to be more enjoyable than a future in which we become bankrupt, thus making the goal of achieving financial independence considerably more commonly held than that of bankruptcy. We need not experience these outcomes in order to make a determination about their desirability because we are able to imagine what these futures might be like before they ever occur, and to avoid the consequences of those futures before they ever happen (Gilbert & Wilson, 2007). One of the primary ways by which we come to pursue one goal over another, then, is through the simulation of possibilities for our futures, and seeing how these simulations make us feel.

This process of simulating consequences before they occur is rather different from the way that other animals determine which behaviors to pursue. Although most animals can learn to predict consequences they have experienced at one time in the past as the result of a particular antecedent behavior (i.e., through operant conditioning), the simulation and anticipation of consequences that one has never experienced before appears to be a uniquely human ability (Gilbert & Wilson, 2007; Suddendorf, 2006), and—more to the point—has been argued to be exclusively available to conscious processes (Baumeister & Masicampo, 2010; cf. Fukukura et al., in press).

Of course, merely simulating a desirable end state does not make it so. If simulation of the future is to contribute to effective goal pursuit, it must ultimately change our actions in the present. One important means by which it may do this is by modifying one's automatic associations and evaluations of the simulated objects and outcomes (see Baumeister & Masicampo, 2010; Ferguson & Wojnowicz, 2011). For example, by simulating the accolades one might receive if one's latest research idea were to be reported in a well-respected media outlet, one may systematically retool the positivity one experiences both toward the goal of completing the paper and toward objects related to the pursuit of completing a paper related to these research ideas

(e.g., libraries). In other words, the ability to consciously envision new sources of reward may lead one to strategically adopt a new goal, which may then alter the implicit value (positivity, negativity) associated with the means to get there (Ferguson & Wojnowicz, 2011). Such changes in the implicit associations toward the goal itself as well as to the stimuli associated with the goal might then, in turn, initiate the kinds of nonconscious self-regulatory processes that are necessary for attaining it. In this way, although consciousness may not be directly involved in the moment-to-moment guidance of behavior, it may nonetheless have a hand in the process by influencing some of the processes that *do* directly control behavior.

Another way that simulation of the future may translate into behavior in the present is by fostering a strong commitment to one's goals or by changing our beliefs about the feasibility of attaining those goals. Oettingen and colleagues (see Oettingen & Stevens, 2009, for a recent review) have shown in numerous studies that one of the most effective self-regulatory strategies to foster goal achievement is in the mental contrasting between a desirable future and the present reality in which the desirable outcomes have not yet been realized. By making both the (simulated) fantasy and the present reality simultaneously accessible, individuals are made aware of the ways in which the present reality is standing in the way of achieving a desirable end state. The ultimate result is increased motivation to change the present reality in order to bring about the imagined end state as well as corresponding increased beliefs in the feasibility of attaining the goal, leading to strong goal commitment.

Oettingen and colleagues contrast this self-regulatory strategy with that of merely simulating a positive future ("fantasizing") or merely considering the negative reality in which a goal is not realized ("dwelling"), neither of which strongly compel an individual to act, in part because of a misalignment in individuals' high goal commitment with their beliefs about the low feasibility of goal attainment. For example, in one study, Oettingen, Pak, and Schnetter (2001) manipulated whether freshman in a mathematically intensive college program engaged in mental contrasting, fantasizing, or dwelling on their math ability. Two weeks after the exercise, teachers were asked to provide subjective ratings of effort for each student as well as the students' grades for the previous two weeks. The results showed that students who completed the mental contrasting exercise exhibited a positive relationship between their expectations

for success and their corresponding investment of effort and math achievement during the previous two weeks. However, students in the fantasizing and dwelling conditions showed no such relationship. In other words, those who fantasized or dwelled on math achievement exhibited increased commitment to the goal of math achievement, but this did not translate into increased effort or success in achieving the goal.

One important way that mental contrasting—and by extension, simulation—may facilitate goal achievement is through the thorough consideration of the potential obstacles that may disrupt goal pursuit. By contrasting the current reality with the desired future, one is encouraged to simulate potential current impediments to goal attainment, thus giving one an opportunity to prepare for these setbacks should they occur. This ultimately increases the likelihood of overcoming obstacles, by encouraging individuals to either develop a plan to handle them (i.e., an implementation intention, e.g., “If I feel tired after work, I will put on my running shoes and go for a walk”), or to engage in anticipatory counteractive control strategies to prevent them from occurring at all (e.g., “I won’t buy any fattening snacks on this grocery store trip so that I can’t indulge during CSI: Miami”; see Fishbach & Trope, 2007, for a review of this kind of counteractive self-control).

Thus, one primary role that conscious simulation may play in effective goal pursuit is in its ability to anticipate. Successful self-regulation is not merely about taking advantage of present opportunities but is also about anticipating and exploiting opportunities that are yet to come. Consciousness may contribute to our ability to effectively take advantage of these future opportunities by allowing us to prepare for them. Gollwitzer and colleagues’ (Parks-Stamm & Gollwitzer, 2009) work on implementation intentions bears this out. To the extent that we can correctly anticipate future opportunities that may become available to us (“If I finish work early...”) and can consciously derive a suitable plan to take advantage of those opportunities (“... I will go to the gym before dinner”), we are more likely to engage in effective self-regulation strategies and have a greater chance of success in our goal pursuits (e.g., Brandstätter, Lengfelder & Gollwitzer, 2001; Gollwitzer & Brandstätter, 1997). Thus, the ability of our conscious processes to anticipate may help to put in place the appropriate automatic associations in memory (finish work—go to the gym) that ultimately allow nonconscious processes to effectively exploit the current environment without further conscious intervention.

## Conclusion

In this chapter, we critically reviewed evidence in the social cognition literature suggesting that everyday goal pursuit requires considerably less conscious intention and deliberation than classic theories of self-regulation assume. Although this evidence is impressive, and mounting, we also identified caveats to thinking about goal pursuit as simply either conscious or nonconscious. We argued that both conscious and nonconscious processes likely play a role in effective goal pursuit and self-regulation, and that the challenge for future research will be to identify precisely *when* different types of conscious versus nonconscious processes are necessary and sufficient for successful goal pursuit. Such questions about the functionality of consciousness in goal pursuit mirror similar questions about consciousness across all other domains of human behavior: How much do we need to be (consciously) aware of our own lives in order to live them? The answer so far from the social and cognitive literatures seems to be “not much,” but, as always, the devil is in the details. If the consensus is that consciousness is rarely necessary, it becomes all the more intriguing to find the exceptions to that rule.

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