What is implicit about goal pursuit?

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Many of the iconic topics in social psychology – attitudes, stereotypes, decisions, moods and emotions – have been re-conceptualized over the last few decades from an implicit cognition perspective. This perspective assumes that mental phenomena and behavior operate according to processes that the perceiver is unable to identify or recognize (e.g., Bargh, 2007; Greenwald & Banaji, 1995; Nisbett & Wilson, 1977; Wilson, 2002; Wilson & Dunn, 2004). For example, cognitive psychological research has shown that people cannot accurately introspect on *how* certain memories or answers spring to mind. When asked who the Democratic vice presidential candidate was in the 1984 U.S. election, for instance, people may be able to report the answer but have limited or no access into the processes that gave rise to it. As applied to social psychological phenomena, this perspective has introduced a focus on how mental processes as well as behavior can occur without the person's intention or awareness. Practically, this focus has taken two directions in terms of empirical work. First, social psychologists have examined the *unintentional* downstream effects of intentionally activated constructs. Second, researchers have studied whether a construct, such as an attitude or stereotype, can itself be activated in memory without the person's intention or awareness. This implicit cognition perspective has ushered in a new wave of research on how human social behavior can proceed nonconsciously, without the traditionally assumed components of conscious control and guidance (for reviews, see Bargh, 2007; Bargh & Ferguson, 2000; Greenwald & Banaji, 1995; Hassin, Uleman, & Bargh, 2005), as the assortment of chapters in this current handbook attests.

Especially over the last ten to fifteen years, the implicit cognition perspective has extended to the topic of motivation, which is in many ways a quintessential example of what is assumed to be a consciously mediated, intentional phenomenon. According to the traditional social psychological literature, one of the hallmark characteristics of goal pursuit is its inherent

intentional and conscious planning, execution, and monitoring (e.g., Bandura, 1986; Carver & Scheier, 1998; Deci & Ryan, 1985; Gollwitzer, 1990; Locke & Latham, 1990; see also Mischel, Cantor, & Feldman, 1996 for a review). For example, much of the early and even some of the recent work on motivation emphasized how people intentionally set a goal, deliberately invest effort to pursue it, and then consciously and reflectively assess the progress and trajectory of the pursuit. In this chapter, we instead review research on goal pursuit from an implicit cognition perspective. Much of this work has occurred over the last two decades, though there are important and influential earlier traces of relevant ideas and empirical evidence. One characteristic, and strength, of the research conducted over the last two decades has been its reliance on more sophisticated methodology geared toward measuring implicit influence, and more refined theory on how human cognition works (e.g., see Ferguson, Hassin, & Bargh, 2008).

The two lines of empirical work in implicit social cognition mentioned earlier also exist with regard to the topic of motivation. The first line of work, that a conscious and intentional state – in this case, a goal – might lead to a variety of implicit or unintended effects, was clearly evident in the work of the New Look in the 1940's and 50's (e.g., Bruner, 1957; Bruner & Goodman, 1947) as well as in the work on need for achievement by McClelland and colleagues (e.g., De Charms, Morrison, Reitman, & McClelland, 1955; McClelland, Atkinson, Clark, & Lowell, 1953; McClelland, Koestner, & Weinberg, 1989). People may consciously want something and strive for it, and not realize or intend for that goal to subtly influence the way in which they perceptually decode an ambiguous stimulus in the environment. Surely, this kind of effect on perception is both unintended, and also largely escapes conscious detection. We do not realize that the drawing of the elderly woman we are looking at from across the room could also have been interpreted as a young woman, for instance. We review recent work showing how

conscious or explicit goal pursuit yields a variety of implicit effects in the first section of the present chapter.

The second line of work on how goals can be unintentionally activated was prefaced by early theoretical traditions espousing the possibility of nonconscious motivations – such as Freud's writings (e.g., Freud, 1901, 1920, 1923). Although there are important differences between the Freudian notion of the nonconscious, and the contemporary social-cognitive notion of the nonconscious (e.g., see Wilson, 2002), this theoretical work was an important forerunner to empirically-based social cognitive work on the same topic that has emerged over the last two decades. We review this contemporary work in the second section of the current chapter.

Implicit motivation is a burgeoning area of research within social psychology (see Shah & Gardner, 2008), and especially within social cognition, and at times the empirical findings have jumped ahead of the theoretical perspectives to explain or predict them. In the final section of the chapter, we raise what we consider to be some of the most pressing theoretical questions in this area. Many of these questions can be applied to implicit social cognitive phenomena in general, but some are specific to motivation and goal pursuit.

Finally, it seems necessary to briefly discuss the terminology we use in the chapter, especially because there are some differences in the way in which key terms are used across areas of social psychology, as well as across social and cognitive psychology. First, we adopt a fairly non-controversial social cognitive definition of a *goal* as a cognitive representation of a desired end-state that can influence evaluations, emotions, and behaviors (see Fishbach & Ferguson, 2007). However, we discuss this definition in more detail and raise some questions about it in the third section of the chapter. Second, we define the term *implicit* as a characteristic of a process or behavior that occurs unintentionally and at times without conscious awareness.

This definition is largely accepted across social cognition, but it should be noted that cognitive psychologists and some social psychologists tend to define *implicit* in a slightly different manner. Namely, an implicit memory is a memory that is influenced by experiences of which the perceiver is unaware (e.g., Greenwald & Banaji, 1995; Roediger, 1990; Schacter, 1987). This means that the cognitive definition assumes both a lack of intention *and* a lack of awareness. In contrast, the social cognition definition does not insist on the trace or influence being incapable of being recognized by the perceiver, it simply depends on the lack of intention. This means, for example, that an attitude might be classified as implicit simply because it was generated spontaneously, even if the perceiver is or can easily become aware of it once it has been activated (see Gawronski, LeBel, & Peters, 2007). Obviously, when a phenomenon or process is intentional, it will also be conscious. When a phenomenon is conscious however, it does not necessarily mean that it was intentional (e.g., mood or emotional states, or obsessive thought; see Loewenstein, 1996). Another way to state the same thing is that an unintended phenomenon can be conscious or unconscious. We attempt to point out when social cognitive researchers assume a lack of awareness *in addition* to a lack of intention when using the term implicit to describe a phenomenon.

Section I: The unintentional effects of intentional goals

A growing body of research shows that motivational states lead to a variety of implicit effects during goal pursuit. These effects include, but are not limited to, effects on perception, knowledge accessibility, attitudes, and behaviors. All of the following work relied on dependent measures that could capture such unintended effects. Often times, the measures were ostensibly about a task that seemed unrelated to the construct of interest (in these cases, a conscious goal).

Implicit effects on perception

As a forerunner to contemporary social cognitive research, Bruner and colleagues investigated the influence of internal (e.g., needs, beliefs) factors on what one perceives in the external world (e.g., Bruner & Goodman, 1947). These "New Look" theorists argued that one's reality does not simply exist as a given, but rather is constructed by many top-down factors, such as one's values. In a classic test of this hypothesis, Bruner and Goodman (1947) asked children to estimate the size of different coins using a light cast into a box that they could adjust accordingly. The researchers found that poor children tended to overestimate the size of the coins more than rich children. One explanation for these findings is that poor children valued money more than rich children (i.e., perhaps having a stronger goal to acquire money), and this difference in valuation resulted in a correspondent difference in the perceived size of the coins. In this way, the children may have been conscious and intentional about such a goal, but would have presumably not realized or intended that goal to influence their estimation of coin size. In other words, their conscious goal had an unintended effect on their perception of money-related stimuli in the environment.

McClelland and colleagues further tested the effects of internal factors on perception (e.g., De Charms, Morrison, Reitman, & McClelland, 1955; McClelland, Atkinson, Clark, & Lowell, 1953; McClelland, Koestner, & Weinberg, 1989). Like Bruner and colleagues, these researchers argued that our perceptions depend upon both sensory inputs from the environment and our a priori beliefs and knowledge. For example, a word that is visually partially obscured will, in many cases, still be *perceived* as the word in its entirety because our knowledge of the word influences our perception (e.g., McClelland & Rumelhart, 1981). More to the point, however, is that included in the repertoire of a priori influences on perception are chronic motives. McClelland and colleagues tested this idea largely through the use of projective test

methodologies, such as the Thematic Apperception Test (TAT), in which participants are asked to interpret ambiguous images and stories. From this work, the researchers concluded that internal motives, and especially the need for achievement, could reliably be derived from individuals' perceptions on projective tests. Furthermore, behaviors consistent with these motives could reliably be predicted from performance on projective tests. These results suggest that people's achievement needs, which may at times (but not always) be consciously accessible and intentional, have unintended effects on the interpretation of ambiguous visual scenes and narratives.

In a recent set of experiments that represents a contemporary re-examination of the New Look thesis, Balcetis and Dunning (2006) demonstrated that temporary motivational states influence individuals' perceptions. Over the course of five studies, the researchers found that participants' current motivational states guided how they disambiguated visual stimuli. In one experiment, participants were told that their ultimate task would be to drink either a desirable or undesirable beverage, depending on the random assignment of the computer. Half of the participants were told that if the computer produced a letter, they would drink the desirable drink, while the other half were told that if the computer produced a number, they would drink the undesirable drink. In fact, all participants were shown an ambiguous figure that could easily be interpreted as either an uppercase "B" or the number "13". This ambiguous figure was shown only briefly before the computer ostensibly crashed. The critical measure was what participants reported seeing before the computer "crashed". A large majority of the participants reported seeing the image that would have allowed them to drink the desirable beverage. In a series of follow-up experiments, the researchers established the generality of this effect, as well as ruled out alternative explanations for these findings, such as participants' dishonesty. As Balcetis and

Dunning point out, these experiments are a quite literal illustration of the assertion that we see what we want to see—and suggest, more generally, that our (conscious and intentional) wants can unintentionally influence our lower-level perceptions (e.g., visual, auditory).

Implicit effects on knowledge accessibility

A number of early cognitive-motivational theories and models have posited that a relationship exists between motivational states and concomitant goal-related knowledge activation. Specifically, these theories claim that patterns of knowledge accessibility during goal pursuit are in the service of doing—that is, that the relationship between goal activation and knowledge accessibility is functional in nature (e.g., Ach, 1935; Bruner, 1957; Kuhl, 1983). For example, Bruner (1957) suggested that need states direct attention toward goal-facilitating objects, which in turn prepares one for action and enhances one's ability to attain a given goal. Likewise, Kuhl and colleagues (1983, 1987; Goshke & Kuhl, 1993) suggested that successful action-oriented goal pursuit is characterized by activation of goal-relevant memories. Indeed, contemporary work in social cognition has supported these contentions. Recent findings show that goal states lead to increased accessibility of goal-related knowledge and decreased accessibility (i.e., inhibition) of goal-irrelevant and goal-hindering knowledge (e.g., Aarts, Dijksterhuis, & De Vries, 2001; Fishbach, Friedman, and Kruglanski, 2003; Förster, Liberman, & Higgins, 2005; Moskowitz, 2002). Moreover, there is also evidence that the strength of activation of goal-related knowledge is related to the strength of the goal (Förster et al., 2005).

Aarts and colleagues (e.g., Aarts & Dijksterhuis, 2000; Aarts et al., 2001) were among the first to empirically show that there is heightened goal-related knowledge accessibility while in motivational states. In one experiment conducted by Aarts et al. (2001), some participants were made to feel thirsty during an initial task, while others were not. In an ostensibly unrelated

task, all participants were then asked to complete a lexical decision task in which they needed to quickly decide whether or not a string of letters formed a word, eight of which were drink-related words. As predicted, thirsty participants were significantly quicker to correctly classify drink-related stimuli as words than were participants in the control conditions. Thus, drink-related memories were more accessible for thirsty participants. In a second experiment, thirsty participants and control participants were placed in a room with several items, eight of which were related to quenching thirst. In a later surprise recall task, conducted in a different room, thirsty participants were better able to recall drink-related items than were control participants. In another set of studies, Moskowitz (2002) found that even when a task required participants to ignore goal-relevant objects, attention was directed toward goal-relevant information when the respective goal was activated. Taken together, these studies suggest that when in a conscious need state, people are more inclined to perceptually search for, and attend to, goal-related objects, even if it interferes with a focal task. These findings offer strong support for the contention that intentional motivational states at times unintentionally lead to increased accessibility of goal-related knowledge, which then guides attention toward goal-related objects.

There is converging evidence that conscious goals not only increase the accessibility of goal-relevant knowledge, but can also *reduce* the accessibility of goal-irrelevant and goal-hindering knowledge. Shah, Friedman, and Kruglanski (2002; Study 1), for example, found in one study that the conscious generation of one important goal inhibited the activation of other important, but interfering alternative goals. Shah et al. also found that the person's level of commitment to the focal goal, as well as reported tenacity to reach the goal, moderated this effect such that those with high commitment and tenacity showed a stronger inhibition effect. Importantly, participants were not trying to inhibit other goals, their focal task was to generate an

important goal, and an unintended consequence of this generation was the inhibition of competing goals.

Unlike knowledge activation due to other sources (e.g., semantic priming), recent findings suggest that this pattern of activation while in a conscious goal-state (i.e., enhanced accessibility of goal-related knowledge and reduced accessibility of goal-irrelevant knowledge) endures only until one has completed the goal (e.g., Förster et al., 2005; Goschke & Kuhl, 1993). Förster et al. (2005) conducted a series of six experiments in which they found that the accessibility of goal-related information was enhanced while conscious and intentional goal-pursuit was ongoing, but inhibited immediately following goal attainment. Additionally, both goal-related knowledge activation during goal pursuit and post-completion goal-related knowledge inhibition were related to the strength of the intentional goal, as measured by the expectation for successful goal completion as well as the value that the goal held. One reason that goal-related knowledge is inhibited post-fulfillment may be that in many cases another goal will become activated after the completion of a particular goal (e.g., Fishbach, Dhar, & Zhang, 2006), thus rendering knowledge related to the original focal goal irrelevant.

Implicit effects on attitudes

Intentional and conscious goal states lead not just to the activation (or inhibition) of goal-related knowledge, but also specifically to the spontaneous (i.e., unintended) activation of evaluatively positive goal-related memories, as well as the spontaneous inhibition of evaluatively negative goal-related memories (e.g., Brendl, 2001; Brendl, Markman, & Messner, 2003; Ferguson & Bargh, 2004; Markman & Brendl, 2000; Moors & De Houwer, 2001; Moors, De Houwer, Hermans, & Eelen, 2005; Payne, McClernon, & Dobbins, 2007; Seibt et al., 2007; Sherman, Rose, Koch, Presson, & Chassin, 2003; Waters, Carter, Robinson, Wetter, Lam, &

Cincirpini, 2007). As in the case of the selective accessibility of goal-related knowledge while in

a conscious goal state (see Bruner, 1957; Shah et al., 2002), there is a functional explanation for

the net evaluative positivity of memories associated with the goal (as well as the net evaluative

negative appraisal of objects that might interfere with the goal) while in a goal state (e.g., Lewin,

1936; Ferguson & Bargh, 2004). Indeed, evaluative appraisals of stimuli (i.e., evaluations or

attitudes) serve to characterize the corresponding stimuli as either desirable potential rewards

when evaluatively positive or as undesirable potential threats when evaluatively negative (e.g.,

Fazio, 1989; see also Ferguson & Bargh, 2004, 2008). In the former case, one will tend to

approach those stimuli while in the latter case one will tend to avoid them. Conscious goal

states, then, lead to functional (yet unintended) evaluations of goal-relevant stimuli, which

should then guide and shape behavior toward those stimuli in a goal-consistent manner.

As one example of this work, Ferguson and Bargh (2004) manipulated participants' thirst

such that half the participants were thirsty and half were not. The researchers then used a

sequential evaluative priming task (e.g., Fazio et al., 1995; Fazio et al., 1986) to determine

participants' implicit attitudes toward goal-relevant versus goal-irrelevant objects. In the task,

participants briefly saw a prime consisting of either a goal-relevant word (e.g., *water*) or a goal-

irrelevant word (e.g., *trees*). The prime was followed by a target word that was either positive or

negative. Participants were instructed to categorize the target word as either positive or negative

as quickly as possible. If they evaluated the prime as positive, then they should be quicker to

correctly categorize a positive versus a negative target word, whereas if they evaluated it as

negative, they should be quicker to correctly categorize a negative versus a positive target word.

As predicted, thirsty participants evaluated goal-relevant primes more positively than goal-

irrelevant primes, whereas nonthirsty participants did not show this pattern. In addition, thirsty

participants showed the greatest implicit positivity toward highly goal-relevant objects (e.g., *water)*, followed by weakly goal-relevant objects (e.g., *coffee)*, then goal-irrelevant objects (e.g., *trees*). This last finding suggests that people's goal-driven attitudes are sensitive to the *extent* to which objects could be helpful to the goal.

Research on the effect of intentional, conscious goals on unintended attitudes also demonstrates that the effects exist only as long as the goal is active, such as is the case when participants are in a state of temporary deprivation (Ferguson & Bargh, 2004; Payne et al., 2007; Sherman et al., 2003; Waters et al., 2007). In the thirst study just described, the predicted effects in thirsty participants emerged in comparison to those participants who had been thirsty minutes earlier but who had sated it by drinking water and juice before the implicit attitude measure. These findings complement research on addiction, which has shown that habitual heavy smokers who had not recently smoked, as well as those who explicitly reported feeling withdrawal symptoms, implicitly evaluated smoking-related items (e.g., a pack of cigarettes) more positively than smokers who had recently smoked or who were not experiencing withdrawal symptoms (Sherman et al., 2003; see also Payne et al., 2007; Waters et al., 2007).

Recent findings have established that the activation of a conscious goal will not necessarily always lead to more positive implicit attitudes toward stimuli that might foster goal pursuit. Instead, only those who have some level of skill at the goal, and some motivation to approach the goal, will exhibit such an effect (Ferguson, 2008). This means that when the goal is easy to attain (e.g., sating thirst), then most people should have plenty of experience succeeding at the goal, and should demonstrate more positive implicit attitudes toward goal-facilitating stimuli whenever the goal becomes active. However, when the goal is more difficult (e.g., academic achievement, dieting), then only those who are generally successful at the goal will

show the effect on implicit attitudes. For example, when participants had the conscious goal to academically achieve (versus not), they implicitly evaluated school-related stimuli as more positive only if they had a relatively high GPA (Ferguson, 2008).

It is important to note that one assumption of the functional argument here is that any goal-driven increase in the positivity of implicit attitudes toward goal-facilitating stimuli will actually lead to behavioral changes. That is, implicit attitudes are assumed to possess predictive validity for behavior, a claim that is supported by a burgeoning literature (e.g., Wittenbrink & Schwarz, 2007). And yet, it seems reasonable to expect that one's implicit attitudes toward certain goal-relevant stimuli are more predictive under some circumstances rather than others. For example, recent work shows that when people are under cognitive fatigue or deficit (e.g., from alcohol, ego-depletion), their implicit attitudes toward temptations are more likely to predict their behavior, compared with when they are not under such duress (e.g., Hofmann & Friese, 2008; Hofmann et al., 2007, 2008). In one study, participants were either under the influence of alcohol or were not, and were asked to sample some candy (Hofmann & Friese, 2008). Interestingly, alcohol-impaired participants' implicit attitudes toward candy strongly predicted their consumption, while control participants' implicit attitudes toward candy did not. Of course, one critical question is whether control participants' behavior might have been predicted by their implicit attitudes toward some other type of stimuli (perhaps related to their long term dieting goals). This line of work raises intriguing issues concerning the types of implicit versus explicit attitudes that ultimately drive behavior depending on circumstances, especially those related to self-control resources.

Implicit effects on behavior

If conscious goals lead to unintended effects on attitudes toward goal-related stimuli, then goal states should also influence unintended approach and avoidance behaviors in a similar fashion. A number of studies have employed variations of a lever-based tool for measuring approach and avoidance behaviors (e.g., De Houwer, 2003; Markman & Brendl, 2005; Fishbach & Shah, 2006; Seibt, Hafner, & Deutsch, 2007; Fitzsimons & Shah, 2008). These measures share several methodological procedures. For instance, in all cases participants are presented with stimuli, typically on a computer screen. In response to these stimuli, participants are asked to either pull a lever (or joystick) toward them or push it away from them. To the extent that pulling is done more quickly one is said to have an approach orientation toward that object or construct.[1] Likewise, to the extent that pushing is done more quickly, one is said to have an avoidance orientation relative to that object or construct. This measure captures behavioral effects that are subtle, in that although participants are obviously aware that they are pushing and pulling the lever, they are presumably not aware of pushing (or pulling) the lever slightly faster in response to some stimuli, in some situations, for instance. In this way, this work suggests ways in which a conscious goal can subtly alter the force or duration of an intended behavior without the person realizing it (see also Aarts, Custers, & Marien, 2008).

As one example of this work, in a study by Fishbach and Shah (2006) in which a variant of this lever task was used, participants first listed both a chronic goal and a temptation relative to that goal. Next, participants were presented with strings of letters that were one of the following: the goal-related word, the temptation-related word, one of several control words, or one of several non-word strings of letters. Half of the participants were asked to *pull* the lever if

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[1] Work by Eder and Rothermund (2008) suggests that lever-based approach-avoidance tools depend upon the successful mapping of affective codes to motor behaviors, and thus similar effects can be produced with, for example, right and left lever movements when these movements are affectively labeled.

the string of letters formed a word and half of the participants were asked to *push* the lever if the string of letters formed a word, as quickly as possible. The researchers found that participants asked to pull the lever did so more quickly for the goal word than the temptation word, while the reverse was true for participants asked to push the lever. These effects show that simply perceiving a stimulus that is consistent with one's conscious goal facilitates approach arm movements, just as perceiving a disruption to that goal facilitates avoidance arm movements.

If these behavioral movements are due to goal states, then one should expect that they are strongest when there is an active goal. Conceivably, in the Fishbach and Shah (2006) experiments described above, participants' chronic goals were activated by the individual words, thus producing the behavioral results. However, Seibt, Hafner, and Deutsch (2007) explicitly tested the extent to which behavioral orientations (as indicated by arm movements) vary by goal state. In one experiment, they measured participants' behavioral orientations toward food-related and food-unrelated stimuli before and after eating lunch. The results showed that individuals in an unsatisfied need state (those who had not yet eaten lunch) pulled the lever more quickly than they pushed it for food-related stimuli. Those who were no longer in a hunger need state also showed this effect, though to a smaller degree. These results suggest that conscious goal states do indeed influence approach and avoidance behaviors in a goal consistent fashion.

It seems reasonable to expect that conscious goals yield unintended modifications of many different behaviors. Even while a person may be at some level aware of a given behavior, they may not be aware of -- or intend -- all aspects of that behavior (e.g., variations, duration, frequency, strength, etc.). This suggests that once a conscious goal has been activated, people who are knowingly pursuing a goal-consistent behavior may nevertheless unintentionally *enact* that behavior in a more versus less goal-consistent manner. This raises the issue of the many

levels at which a behavior might be identified, and the variation in the (conscious) accessibility of those levels of behavioral identification for the person (e.g., Vallacher & Wegner, 1989). For instance, a person may be consciously trying to "socialize" with a new acquaintance and this conscious attempt at an abstract behavior may also entail more specific, unintentional nonverbal behaviors such as eye-gazing, body orientation, and voice inflection. To study the potential effects of a conscious goal on unintended behaviors of this kind, it would be necessary to first identify which unintentional aspects of any given intentional behavior are goal-consistent, and then test whether the activation of a goal increases their enactment.

Conclusions

In this section, we have reviewed evidence that intentional, conscious goals can lead to a range of effects that are either partially or largely unintended (i.e., spontaneous, implicit). It is important to note that many of the effects described above emerged despite participants' engagement in a non-goal related focal task. For example, the participants in the studies by Moskowitz (2002) were intentionally trying to ignore the goal-relevant distractors and were less able to do so when the respective goal was (consciously) active. Also, the participants in the studies on implicit attitudes (Ferguson & Bargh, 2004; Sherman et al., 2003) were not evaluating the goal relevant words themselves, they were rather trying to evaluate the goal-*unrelated* target words, and their speed in doing so was unintentionally influenced by the goal-relevant primes that preceded those targets. These kinds of effects are easily classified as implicit in that they were unintentional and spontaneous, but they may have been available to consciousness if participants had been asked (e.g., see Gawronski et al., 2007). In contrast, in other research, such as in the studies by Balcetis and Dunning (2006), participants were presumably not aware of the effect of their conscious goal on their perception of the ambiguous figures, which also of course

means they did not intend such effects. In this case the term implicit therefore indicates a lack of intention *and* awareness.

Section II: Evidence for unintentional goal activation

Section I demonstrates that goals that are activated consciously and intentionally elicit effects that are themselves implicit and likely exist, at times, outside of the person's awareness. Such effects clearly illustrate how an implicit cognitive perspective is pertinent to even conscious goal pursuit. Since the early 1990's, however, researchers in social cognition have also revealed that goals can be nonconsciously and unintentionally activated from memory and influence downstream behaviors. This work is reviewed below.

It should be noted that even though a given goal can be activated in memory largely without the person's intention or conscious awareness of that activation, this does not of course mean that conscious processing is irrelevant or unrelated to the activation. Participants are typically consciously engaged in the implicit priming technique, whatever it is, but simply do not report any increased awareness or importance of the goal state, or that they have been primed in some way. Thus, even though participants may be consciously and actively reading and processing words related to the goal within a crossword puzzle, for instance, they do not consciously realize or experience *the effects* of those words on their motivational level or behavior or attitude. In each area below, we consider the empirical evidence suggesting the implicit nature of the goal whenever possible.

Evidence from information processing

The first empirical paper in the social cognition literature on implicit goal activation was by Chartrand and Bargh (1996). In this work, the authors tested whether an impression formation goal can be activated using standard implicit priming techniques. They conceptually

replicated two classic studies on conscious impression formation. These earlier studies tested whether people with the goal to form an impression of another person on the basis of a series of behaviors (vs. to memorize the behaviors) would exhibit greater organizational processing of the behaviors. Instead of consciously activating the goal to form an impression, Chartrand and Bargh asked participants to unscramble groups of words into sentences and some of the sentences contained words related to forming an impression (e.g., *interpret, judge*) whereas for other participants some of the words were related to memorization (e.g., *memory, retain*). The results across two studies showed that even though participants in the impression condition did not realize that they had been primed with an impression formation goal, they showed greater organizational processing of the behaviors compared with those in the memorization condition. For example, they showed significantly greater clustering around the personality traits that corresponded to the behaviors of the target person, a trademark of impression formation.

This first evidence of implicit goal activation demonstrated that a subtle prompt from a perceiver's immediate environment can shift the way in which the perceiver absorbs and organizes social information about another person. Although participants were consciously processing the primes themselves (e.g., *judge, interpret*), they did not report any awareness of those primes on the way in which they completed the person impression task.

Recent work has again examined an implicit impression formation goal (McCulloch, Ferguson, Kawada, & Bargh, 2008). A series of experiments tested more closely which mental operations relevant to impression formation emerged for those implicitly primed with impression formation or not. These findings showed that those who had been implicitly primed with impression formation (versus not) were significantly faster at analyzing the trait implications of behaviors, and were also more likely to form associations in memory between behaviors and the

traits that corresponded with them. Other evidence from this paper showed that those who had been implicitly primed showed more sensitivity to whether incongruent trait information was applicable versus inapplicable to the actor's underlying personality.

The research on implicit impression formation reveals the mental processes that commence when a goal has been activated implicitly, but what about actual social behavior? Research published since Chartrand and Bargh (1996) has focused on this and other theoretically relevant questions, such as: What kinds of stimuli might activate a goal without the perceiver's awareness? How do we know a goal per se is being activated rather than a semantic construct? What is the evidence that the goal is operating outside of conscious awareness and intentions? We review below some of the pertinent literature on these questions.

Evidence from behavior

The next empirical piece to be published on implicit goal activation was by Bargh et al. (2001). This paper described a series of studies that examined the effects of priming a goal on actual behavior. These studies also, importantly, identified the distinction between the activation of a motivational versus perceptual or semantic construct. Earlier literature on motivation revealed certain signatures of motivated behavior, including persistence at the goal, resumption of the goal after an interruption, and an increase in the strength of the goal over time until it is met (Atkinson & Birch, 1970; Gollwitzer & Moskowitz, 1996; Lewin, 1936; McClelland, Atkinson, Clark, & Lowell, 1953). Bargh and colleagues showed that an implicitly activated goal led to behavior that met these classic signs of motivation. For example, in one study, participants were primed with achievement or not and then worked on a word puzzle for a few minutes, at which point the overhead projector that was displaying the puzzle information was rigged to break down. The experimenter told the participants that because of the time lost from

the projector breaking down, participants had to choose whether to continue with the word puzzle (an achievement related task), or move on to the other task in the experiment, which was judging the humor of cartoons (not particularly achievement related). Those who had been primed with achievement (versus not) were significantly more likely to continue working on the puzzle rather than the normatively more enjoyable cartoon task. Most convincingly, another experiment showed that the strength of the implicitly primed achievement goal increased over several minutes, an effect that is inconsistent with the typical decay rates of semantic priming (see Higgins, Bargh, & Lombardi, 1985; Srull & Wyer, 1979). These experiments together demonstrated persistence at the goal, resumption after an interruption, and an increase in strength over time (for a recent review of how goal priming is distinguished from non-goal priming, see Förster, Liberman, & Friedman, 2007).

The evidence in this paper that the activation was implicit comes from the debriefing data. Participants did not report any awareness of any relation or relevance between the initial priming task and the later crossword puzzles. But, one might ask whether the level of participants' conscious awareness of the goal predicted their goal-related behavior. Bargh and colleagues tested this in a different experiment in which participants were implicitly primed with cooperation or not, and were consciously primed with cooperation or not. The dependent variable was the degree to which participants behaviorally considered the greater good in a common resources dilemma game (i.e., a fishing game where the lake had to be kept stocked). Those who were primed implicitly showed more cooperation than those in the control group, and those who were primed explicitly also showed the same effect. Importantly, however, participants were also asked at the end of the experiment how much they had cooperated. The level of cooperation reported by those in the explicit goal condition significantly predicted their

cooperative behavior, whereas the level of cooperation reported by those in the implicit goal condition was completely unrelated to their cooperative behavior. This evidence suggests that participants were not aware of the implicit goal (see also Aarts, Gollwitzer, & Hassin, 2004; Eitam, Hassin, & Schul, 2008; Ferguson, 2008).

Multiple articles have since been published on implicit goal activation effects on behavior. These articles have focused largely on the different kinds of cues in the environment that can activate goals implicitly. Fitzsimons and Bargh (2003) and Shah (2003) have examined how relationship partners can trigger the goals that a perceiver associates with them. Shah (2003), for example, showed that when participants were primed with close relationship partners (vs. not), they tended to pursue the goals that those partners had for them. Interestingly, this effect was moderated by participants' reported closeness to those partners. So, the closer participants reported being with their mother, for instance, the stronger the effect of being implicitly primed with their mother on their reported commitment to the goals their mother had for them. Shah (2003) also showed that the perceived value of the goal to the relationship partner also mattered for the nature of the priming effect such that for those who were close to their father, only those who perceived a goal as being of high value to their father showed an increased commitment to it after being primed with their father. Those who perceived the goal as being of low value to their father showed a decrease in commitment after being primed. Participants did not report any awareness of the priming measures or any relation between the priming measures and the dependent variables.

There are different ways in which one's relationship partners might be associated with relevant goals. One way is when a partner wants the person to pursue a goal, and this is what Shah (2003) examined. However, another way is when one tends to pursue a certain goal when

with a specific partner, and this is what Fitzsimons and Bargh (2003) examined. They showed that participants who had a goal in the context of a certain relationship partner were more likely to pursue that goal after being subtly primed with that partner. For example, participants who reported a goal of trying to achieve in order to impress their mothers performed better on a verbal task after being implicitly reminded of their mother, compared with those who were not primed and also those who did not report having such a goal in the context of their relationship with their mother. In another experiment, importantly, they demonstrated that the goals that one tends to pursue within certain interpersonal relationships can be orthogonal to the partner's own standards or goals (Shah, 2003). In all of this work, participants did not report an awareness of any relation between the priming task and the central dependent measures, suggesting that they had been unknowingly and unintentionally influenced by the partner primes.

Beyond one's relationship partners, what other kinds of cues in the environment might implicitly activate goals? In addition to reading highly goal-relevant words within puzzles or sentence tasks, and reading about one's relationship partners, recent work has shown that reading about a stranger's goal pursuit can unknowingly influence one's own goal pursuit (Aarts, Gollwitzer, & Hassin, 2004). In one experiment, participants read a vignette about a guy trying to pick up a woman in a bar. The authors expected that this would activate among the male participants the goal to seek causal sex. Participants were then asked to provide feedback on a computer task to either a male or female experimenter. Those who were primed with the sex vignette provided significantly more help to the female (but not male) experimenter, compared with those not primed. And, critically, there was no difference between those in the primed condition and control condition in terms of their awareness of a helping intention, suggesting that

the goal was influencing their behavior toward the female experimenter in a subtle, nonconscious manner.

Aarts et al. (2004) also tested whether an undesirable goal can be activated implicitly. Participants read the same casual sex vignette as described above, or one in which the information that the guy had a new baby at home was added to the story, making it normatively undesirable (according to pilot testing). Other participants did not read any sex-related vignette. The results showed that whereas those who read the original sex vignette showed the same goal-relevant behavior, those in the undesirable condition did not, compared with the control condition. This suggests a boundary condition for implicit goal activation – undesirable goals may not be able to be activated implicitly. As a final note, it is worth mentioning that recent work even suggests that reading about another's *effortful* goal pursuit can lead to depletion effects in the perceiver (Ackerman, Goldstein, Shapiro, & Bargh, 2009), also a presumably unintentional effect (see also Dik & Aarts, 2007).

Beyond examining the types of cues that might lead to implicit goal effects on behavior, recent research has addressed the mental contents involved in a goal representation that might underlie such effects. That is, what is it about a goal representation that allows it to direct behavior without one's awareness or intention? Aarts and Custers and colleagues have argued that in addition to information about the relevant behaviors, the underlying mental representations must also include positive affect that can serve as reward cue for performing those behaviors (see Aarts & Custers, 2007; Aarts, Custers, & Holland, 2007; Custers & Aarts, 2005). Aarts et al. (2008) recently tested this claim by asking participants to squeeze a handgrip whenever the word "squeeze" appeared on a computer screen. However, participants first completed a computer paradigm in which the word squeeze was subliminally presented by itself,

subliminally presented and paired with positive (unrelated) words, or not presented at all. Those participants for whom the behavioral instruction had been subliminally paired with positive (reward) cues differed from the other two groups when subsequently squeezing the handgrip: they squeezed more quickly and also exerted their maximum force more quickly.   This work shows that positive affective information may be a crucial ingredient in goals that allows them to direct and shape behavior implicitly (see also Ferguson, 2007).

Researchers have also recently examined whether implicit goal activation might in fact explain effects that have been assumed to emerge due to non-motivational mechanisms (Cesario, Plaks, & Higgins, 2006). Many papers have demonstrated that priming participants with a behavior (e.g., rudeness), stereotype (e.g., the elderly), norm (e.g., quiet in a library), or even smell (e.g., lemon cleaning scent) leads to corresponding effects on behavior (e.g., Aarts & Dijksterhuis, 2003; Bargh, Chen & Burrows, 1996; Dijksterhuis & van Knippenberg, 1998; Holland, Hendriks, & Aarts, 2005). Typically these effects have been interpreted as resulting from the perception of the construct, whatever it is, having direct effects on the likelihood of behaving in line with that construct (i.e., an ideomotor account; see Dijksterhuis, Chartrand, & Aarts, 2007). However, Cesario et al. (2006) argued that at least in some of these cases, especially when the prime invokes a group of people, the perception of the group triggers one's motivation to interact with that group, which can differentially influence the likelihood of behaving in line with that group's stereotypical behaviors. For example, they reasoned that people who show an implicit positivity toward the elderly are motivated to interact with them. Thus, when primed with that group, such people should walk more slowly. Those who show implicit negativity toward the group, on the other hand, should be motivated to avoid interacting with them and should walk more quickly after being primed with the group. Their results

supported this claim. (They also argued that even though people may have a different motivation toward a given group, they should all nevertheless have the same kinds of stereotypes and information about them, which rules out the possibility of an ideomotor account of their findings.)

Evidence from judgments of others

How else might we detect the implicit activation of a goal? Kawada and colleagues (Kawada, Oettingen, Gollwitzer & Bargh, 2004) examined whether people who have been implicitly primed with a goal are more likely to see that goal in other people's behavior, which they interpret as an implicit form of transference (e.g., see also Anderson & Chen, 2002). In one study, participants were implicitly or explicitly primed with the goal of competitiveness, or not primed, and then were asked to read about two fictitious characters playing a prisoner's dilemma game, and rate how likely the characters were to play competitively. The results showed that those who had been primed either implicitly or explicitly with the goal rated the characters as significantly more likely to behave competitively, compared with those in the control condition (there was no difference between the two goal conditions). But, importantly, how do we know that a goal was being primed and not simply the construct of competitiveness? Previous work in the conscious goal literature suggests that the strength of a goal may increase especially when the pursuit becomes difficult (e.g., Brehm & Self, 1989; Brunstein & Gollwitzer, 1996; Förster et al., 2007; Gollwitzer & Kirchhof, 1998; Gollwitzer & Wicklund, 1985; Wright, 1996). Thus, in their next study, participants were primed implicitly, explicitly, or not at all with the goal of competitiveness, and then played a game that was slightly competitive (a word-guessing game) and received either success or failure feedback about their performance. Participants then completed the same ratings task concerning the two fictitious characters in the prisoner's

dilemma vignette. The results showed an interaction between the priming condition and the type of feedback received. Only for those who received failure feedback, those in the two priming conditions rated the characters as significantly more likely to be competitive, compared both with those in the control condition, and all of those who received success feedback. This is suggestive that a goal construct, whose strength should be influenced by goal-relevant feedback, was likely activated initially, rather than merely the trait of competitiveness, for example.

Evidence from knowledge accessibility

Just as researchers have shown that an intentional, conscious goal can influence the accessibility in memory of knowledge related to the goal, some work has tested how an implicitly activated goal leads to similar knowledge accessibility effects. For example, Aarts and Dijksterhuis (2000) tested whether the activation of a goal increases the accessibility of habitual behaviors related to that goal. In one study, participants who were habitual or non-habitual bicycle riders were subtly primed with the goal of traveling (around town). They then completed a task that measured the accessibility of the word bicycle. The results showed that only for those who had first been implicitly primed with a travel goal, habitual bike riders showed enhanced accessibility for bikes compared with non-habitual bike riders. Interestingly, habitual and non-habitual bike riders did not differ in the accessibility of bike when the travel goal had not been primed. This demonstrates that for people who have repeatedly used a particular means to meet a goal, such as riding one's bike in order to get from point A to point B, that means information can become more accessible in memory after the goal has been primed. It should be noted however that these studies did not differentiate between a goal in particular being primed, versus a non-motivational construct (semantic knowledge, procedural knowledge, etc.).

Another line of work that is related to implicitly activated goals and effects on knowledge accessibility is by Shah and colleagues (Shah et al., 2002). Across multiple studies, these authors showed that the implicit (in this case, subliminal) activation of one important goal inhibited the activation of other important, but interfering alternative goals. They also found that participants' reported commitment to the goal and tenacity to reach the goal mattered such that those high on both dimensions showed a stronger inhibition effect (as mentioned earlier, Shah et al. also found this effect when the goal was activated consciously). This work shows that the implicit activation of a goal can lead to inhibition effects that should serve to facilitate the focal goal, in that potential distractions automatically (i.e., spontaneously) become less noticeable.

From a slightly different perspective, Fishbach and colleagues (Fishbach et al., 2003) examined how various distractions and temptations themselves might influence the accessibility of the goal they would undermine. They tested whether the perception of short-term temptations (e.g., TV) that would undermine a longer-term goal (e.g., doing well in school) automatically activated the goal itself. In one study, within a sequential priming paradigm, participants were first subliminally primed with a temptation or goal-related word. They then had to make a lexical decision about a subsequent target word, which was a temptation or goal related word. The main finding was that subliminally perceived temptation primes facilitated relevant goal words, whereas the opposite was not true. That is, when someone perceives the word TV, the goal with which TV might interfere – academics – automatically becomes more accessible in memory. However, when someone sees a word related to academics, the temptations that might interfere with that goal do not seem to spring to mind automatically. One way to interpret this work within the perspective of this chapter is that the heightened accessibility of the goal is evidence that the goal was activated, and that the triggers themselves (the temptations) were

implicit. Another important finding from this work was that this effect was most evident among those participants who most valued the long-term goal, and those who were the most successful at the long-term goal. This provides suggestive evidence that the effects were due to a goal being activated, but of course it is always possible that those who most value a goal and who are successful at it have different kinds of semantic knowledge structures concerning the goal.

More generally, Fishbach and colleagues have conducted a comprehensive line of research on the implicit processes underlying self-control dilemmas, which can be thought of as a special type of goal pursuit. Namely, self-control involves a conflict between an attractive immediate goal that interferes with a longer-term goal. This work has identified the variety of ways in which people handle such dilemmas implicitly, at times according to their skill level, commitment to the goal, and conscious motivation to achieve the goal (see also e.g., Fishbach, Dhar, & Zhang, 2006; Fishbach & Shah, 2006; Fishbach & Zhang, 2008; Koo & Fishbach, 2008). This research is beyond the purview of the current chapter, but is reviewed in detail elsewhere (see Fishbach & Converse, in press; Fishbach & Ferguson, 2007).

Evidence from attitudes

How else might researchers detect whether a goal has been activated implicitly? Work on the effect of intentional goals on implicit attitudes, reviewed earlier, shows that a goal leads to more positive implicit attitudes (Ferguson & Bargh, 2004; Sherman et al., 2003; Seibt et al., 2007) and sometimes explicit attitudes (Cabanac, 1971; Fitzsimons & Shah, 2008) toward those stimuli that might best facilitate the goal (see also Brendl, 2001; Brendl, Markman, & Messner, 2003; Markman & Brendl, 2000). As discussed, this kind of effect should be functional given that those who regard such facilitating objects in a more positive light should be more likely to approach them and potentially reach the goal. Also critically, this work has shown that such

effects are due to goal activation rather than mere semantic priming. When the goal had been met, even minutes earlier, the effect on implicit attitudes disappeared (see Ferguson & Bargh, 2004; Sherman et al., 2003). If a semantic construct had been activated, meeting the goal should have, if anything, made the effect stronger, or left it unchanged (see also Forster et al., 2007).

Does this type of goal-driven reappraisal of the stimuli in our environment occur even when the goal is activated outside of awareness and intentions? Recent work examined this issue (Ferguson, 2008). Across a series of experiments, participants were implicitly primed with words relevant to a goal (e.g., achievement, dieting, cooperation), and then completed an implicit attitude measure. The implicit attitude measure consisted of attitude objects that were subliminally presented. The results showed that those primed with the goal exhibited significantly more positive implicit attitudes toward those stimuli that were highly relevant and helpful to the goal. For example, those implicitly primed with the goal to be thin displayed significantly more positive implicit attitudes toward *gym* and *salads*.

This effect was most likely to emerge for those with some chronic success at the goal. For example, the effect just described emerged only for those who were at least moderately successful at the goal to be thin, and not for those who had the goal but who were largely unsuccessful at meeting it. Furthermore, the effects also tended to emerge for those for whom the primed goal was most currently important or relevant. For instance, in one study, participants were implicitly primed with the goal to eat, and then completed a task measuring their implicit attitudes toward the words *food, eat,* and *snacks*. However, the time that had passed since participants had last eaten moderated the effect of the goal priming condition. Among those who were primed, the more time had passed, the more they displayed highly positive attitudes toward the food-related stimuli. It is also important to note that across all of

these studies, the participants who were implicitly primed with a goal did not report any increased awareness or interest in the goal compared with those in the control condition, suggesting that the goal was *not* more consciously available for these participants.

Recent work has also examined the effect of implicit goals on the (explicit) positivity toward partners within interpersonal relationships. Fitzsimons and Shah (2008) have shown that when a relationship partner can no longer instrumentally facilitate a currently activated, implicit, goal, that partner is devalued on a variety of measures. Across a series of experiments, this work suggests the intriguing possibility that our regard and affection for relationships partners may, at least in some circumstances, be contingent on the degree to which those partners are seen as being able to facilitate our currently active goals, even if we are unaware of the goals themselves.

Beyond the effect of a *temporarily activated* implicit goal on implicit attitudes, research has also examined whether *chronic* implicit goals can be measured with implicit attitudes (e.g., Ferguson, 2007; Glaser & Knowles, 2007; see also Moskowitz et al., 1999; Park et al., 2008). For example, Glaser and Knowles (2007) reasoned that people who have a chronic implicit motive to be egalitarian might in fact possess greater implicit negative attitudes toward prejudice. And, indeed, for those with such negative implicit attitudes, their stereotypes about race did not guide or shape their race-related behavior. Only those participants who did not have such negative implicit attitudes toward prejudice showed evidence of allowing their race-based stereotypes to guide their behavior. This work suggests that people's implicit attitudes may reflect not only recently activated goals, but also chronic motivational tendencies.

Conclusions

As this second section of the chapter shows, there is a substantial and increasing social-cognitive literature on the implicit activation of goals. This work has started to identify the many

ways in which goals might be activated implicitly from the environment – whether by words,

relationship partners, or a stranger's behavior – as well as the types of evidence that might be

used to detect goal activation – from behavior to knowledge accessibility to attitudes to person

impressions. Still, given the range of findings on the implicit effects of intentional and conscious

goals, there would seem to be many interesting avenues for detecting implicit goal activation.

For example, implicit goal activation should lead to effects on perception. Such evidence would

suggest that not only does what people *consciously* want influence how they parse ambiguously

related percepts, what people *nonconsciously* want similarly shapes and guides their perceptions.

Additionally, although some work has addressed how implicitly activated goals influence

knowledge accessibility (Aarts & Dijksterhuis, 2000; Fishbach et al., 2003; Shah et al., 2002), it

would be helpful if we knew that such effects corresponded to the established trajectories of

motivated knowledge accessibility, such as those we reviewed earlier in the chapter (see Förster

et al., 2005; Förster et al., 2007). We now turn to a more specific discussion of various

outstanding questions that arise when considering goal pursuit from an implicit cognition

perspective.

Section III: Outstanding theoretical questions

Among the most pressing theoretical concerns within the area of implicit goal pursuit is

definitional. Namely, what is a goal? Because recent work in implicit cognition has obviated

what used to be a central component of the definition a goal – conscious intention and drive – it

is necessary to specify a definition of a goal that is not dependent on conscious or intentional

processing. Of course, this assumes that that what we talk about when we talk about goals is

operating at both the explicit and implicit level. But, such a definition would not necessarily

imply that implicit and explicit goals are exactly alike, apart from the differential role of

conscious processing. It could be that both implicit and explicit goals meet the minimal criteria we identify as being crucial to the goal construct, but nevertheless differ in some additional characteristics. This topic has yet to be addressed comprehensively within the social cognitive literature.

What is a goal?

As mentioned in the introduction to the present chapter, early research on motivation tended to define goal pursuit as behavior that is consciously and intentionally directed toward a desired end-point (for a review see Elliot & Fryer, 2008). Much of the emphasis from this perspective is on the conscious setting of a goal, and then the conscious monitoring of its progression. There has historically been less emphasis on *how* a goal might be represented in memory, although certainly even early work acknowledged that it was (e.g., Hull, 1931; Tolman, 1932). We mentioned at the outset of the chapter that we adopt a contemporary, social-cognitive definition of a goal as a cognitive representation of a desired end-point that impacts evaluations, emotions, and behaviors (e.g., see also Bargh, 1990; Ferguson & Porter, 2009; Fishbach & Ferguson, 2007; Gollwitzer & Moskowitz, 1996; Higgins & Kruglanski, 2000; Moskowitz, Li, & Kirk, 2004; Sorrentino & Higgins, 1986). Both structural as well as content characteristics of a goal have been identified and are discussed in more detail elsewhere (Ferguson & Porter, 2009; Fishbach & Ferguson, 2007) but will be briefly summarized here. In terms of structural characteristics, a goal is assumed to fluctuate in accessibility across time, person, and situation, a goal is assumed to consist of a diverse array of interconnected memories (e.g., evaluative, procedural, episodic, and semantic knowledge), and the memories related to a goal are assumed to operate according to the basic information processing principles of facilitative and inhibitory processes. In terms of content characteristics, a goal is assumed to consist of information about

the end-point, information about means to reach the end-point, and evaluative or affective information.

It is useful to note that the evaluative information associated with a goal is what presumably gives it its motivational force and influence (Carver & Scheier, 1981; Custers & Aarts, 2005; Kruglanski et al., 2002; Peak, 1955; Pervin, 1989; Shah et al., 2002; Young, 1961). But what exactly is it about affective information that accomplishes this? Interestingly, recent work by Berridge and colleagues have identified two kinds of reward-based brain circuitry in rats. One they have termed "liking" and the other "wanting" (Berridge, 2003; Berridge & Kringelbach, 2008; Berridge & Robinson, 2003; Winkielman & Berridge, 2004). Liking refers to behavioral expressions of pleasure common across many mammals, such as pursing and protrusions of the lips and tongue when experiencing a bitter or disgusting taste, and licking of the lips when experiencing a sweet or sugary taste. Wanting, on the other hand, refers to effortful attempts to acquire something, such as food pellets. Berridge and colleagues have found that these two reward-based behaviors can be dissociated in rats, and appear to be based on at least partially independent neural substrates in the nucleus accumbens. After region-specific administered lesions or drug inhibitors, rats show the behavioral manifestations of liking, but are incapable of wanting behavior, as well as the reverse. It is important to note however that such dissociations are probably rare in natural circumstances, and it is unclear how such a dissociation might map onto human behavior (though see Aharon, Etcoff, Ariely, Chabris, O'Connor, & Breiter, 2001; Robinson & Berridge, 2008). Perhaps the positive evaluative or affective information involved in goal pursuit is more closely dependent on the "wanting" type of reward processing, but we reiterate the potential difficulty of experimentally investigating this in humans. For example, it would not be sufficient to demonstrate that

pleasure ratings of some stimulus are dissociated from effortful behavior to acquire that stimulus, given that differences between method and response scale can introduce variability and dissociation that does not reflect different underlying processes. Still, this work suggests interesting future research directions for understanding how exactly affect is involved in goal representations, pursuit, and the associated underlying neural circuitry.

Mechanism

The topic of mechanism for many of the effects we have thus far reviewed is of course related to the previous discussion of what we consider to be the minimal criteria for a goal. However, the language of the previous discussion was admittedly underspecified in terms of cognitive architecture and process. In part, such generality seems necessary so that goal-related phenomena can be appreciated (and tested) by researchers without them committing to the assumptions, terminology, and methods of a particular model of cognition. In this way, scholars who have different allegiances to cognitive models can attempt to explain and test various hypothesized components of a goal using the language and methodology of her or his model of choice.

What are the possible cognitive models that might be used to explain goal pursuit? We view this as one of the most pressing theoretical questions in this area. As with much early and even contemporary social cognition work, many goal-related phenomena are assumed to operate according to classic associative networks (e.g., Collins & Loftus, 1975), though there have not been many attempts to model phenomena formally. Dual-process models, which have been successfully applied to many classic social psychological constructs (e.g., see Gawronski & Bodenhausen, 2006), have seldom been applied to goal pursuit. Standard dual-process models assume that the brain operates according to two different processes – one primarily based on an

associative network guided by the temporal and spatial contiguity and semantic similarity among stimuli, and the other a propositional knowledge base that operates by logical analysis and reasoning (e.g., Deutsch & Strack, 2006; Gawronski & Bodenhausen, 2006; Rydell & McConnell, 2006; Sloman, 1996; Smith & Decoster, 2000; Strack & Deutsch, 2004). The latter process is assumed to enable conscious endorsement and logical analysis (e.g., computing the truth of a proposition). Goal pursuit is an especially interesting phenomenon because it classically involves what is assumed to be some type of executive functioning, and often involves conscious and intentional decision-making and reasoning (e.g., "willfully" overcoming temptations). At the same time, as we have argued in this chapter, goal pursuit (always) operates according to a variety of implicit mechanisms and processes which have often been explained in the context of dual-process models by associative processes. There are therefore many interesting questions about how two such different types of goal-relevant processes might interact, and the role of consciousness in each (see Hassin, 2005).

One of us has argued elsewhere that additional models of cognition may be useful in trying to explain goal-related phenomena (Ferguson & Wojnowicz, 2008; see also Wojnowicz, Ferguson, Dale, & Spivey, in press). A dynamical systems approach assumes one underlying "process" whereby any mental state is assumed to reflect one of many possible (nonlinear) trajectories through a high dimensional state space (e.g., see Spivey, 2007 for a review; see also Conrey & Smith, 2008). Rather than a stage-based process whereby initial representations are discretely discarded or endorsed, this perspective assumes that any thought, action, utterance, etc., is the end-result of a *continuous* (and nonlinear) process of competition. Research has shown that this perspective can explain both low-level perceptual and cognitive processing, such as word analysis and visual attention (e.g., Abrams & Balota, 1991; Gold & Shadlen, 2000;

McClelland & Rogers, 2003), as well as high-level cognition, such as decision-making (McKinstry, Dale, & Spivey, 2008; Roe, Busemeyer, & Townsend, 2001; Townsend & Busemeyer, 1989) and evaluation (Wojnowicz et al., in press). Given that this perspective can be applied to high-level, seemingly discrete decisions, it might be helpful in addressing the mechanisms that enable people to resolve choices between two goal-relevant alternatives (e.g., self-control dilemmas).

A dynamical systems perspective would also suggest a different way of thinking about a person's "free-will", which is a construct regularly invoked in research on goal pursuit. Namely, rather than assuming an executive controller that hierarchically controls lower-order sub-processes, a dynamical systems perspective is consistent with self-organizing principles, which are commonly espoused across the nature sciences (e.g., Gisiger, 2001; Kaufmann, 1995). Such principles can explain how many different interacting components of a system can organize into a stable pattern or structure without invoking an orthogonal executive controller. We argue that in the search for an underlying cognitive model for goal pursuit, an inclusion and consideration of multiple cognitive models and perspectives would be useful and productive, just as such a comparative analysis has been generative in other areas of cognitive science.

Development

The developmental trajectory of goal pursuit has traditionally been conceptualized in terms of the question of *when* humans first show signs of understanding goal pursuit, at least in terms of being able to infer it in others. Classical work in social psychology shows that people are remarkably ready to infer goal states in even animated geometrical figures, as well as in other people (e.g., Heider, 1944; Heider & Simmel, 1944; see also Hassin, Aarts, & Ferguson, 2005). For example, developmental psychologists have argued that humans infer goal states in others

starting at least at the age of 12 months (e.g., Csibra, Gergely, Biro, Koos, & Brockbank, 1999; Kuhlmeier, Wynn, & Bloom, 2003; Premack & Premack, 1997). This work implies that some understanding of goal pursuit seems to emerge very early on, at least to the extent that an understanding of goal pursuit can be assumed to emerge as soon as one shows a readiness to infer goal pursuit in others.

But, how exactly does a *particular* goal develop? Though there has been scarce research on this question, some recent work suggests that behavioral activities can become more goal-relevant when paired with positive affect. Aarts and colleagues have found that when behaviors (e.g., puzzle) are paired repeatedly and subliminally with various, semantically unrelated positive affective cues (e.g., sunshine, happy), participants exert more effort to begin the behavior (see Aarts et al., 2008; Custers & Aarts, 2005), even though they report no awareness of having done so. These authors argue that the inclusion of positive affective information in the representation of an end-point is a crucial determinant of whether someone will nonconsciously strive toward that end-point. Whereas multiple researchers have argued that positive affect is a driving force for (conscious) goal pursuit generally (Carver & Scheier, 1981; Custers & Aarts, 2005; Kruglanski et al., 2002; Peak, 1955; Pervin, 1989; Shah et al., 2002; Young, 1961), Aarts and colleagues have argued that it explains how one might demonstrate classic motivated behavior toward an end-point *without* conscious intention or guidance. The implicit detection of the positive connotation of a stimulus can provoke (and predict) effortful and persistent behavior toward that stimulus, perhaps in a way that one's conscious estimation of that positivity cannot (see also Ferguson, 2007).

One direction for future research might be to further utilize the method of conditioning a stimulus in order to identify the components necessary to elicit classic, motivated behavior

toward that stimulus. For example, instead of adding positive affect to known and highly familiar behaviors or events (e.g., puzzle) that may themselves already be associated with procedural, semantic, and reward-related information in memory, one could condition a novel stimulus with different kinds and degrees of affective, semantic, behavioral, and procedural (means) information. This would consist of a comprehensive building process whereby the sufficiency and necessity of various types of knowledge for motivated behavior could be causally and individually (and interactively) tested. Such an approach would not only help to reveal the critical ingredients of a goal, it could be harnessed to develop strategies to improve the influence of some (desirable) goals, while dampening or mollifying the force of other (undesirable) goals.

Dissociation and boundaries

Another obvious and still largely unanswered question in this area is the degree to which intentional goals differ from unintentional ones. In other words, of what use is conscious intention in the arena of motivation? The consensus seems to be at this point that beyond the obvious phenomenological difference, there are no functional or process differences. This has been concluded based on a handful of studies showing that an implicitly activated goal leads to the same kinds of downstream effects, in nature and degree, as does an explicitly activated goal (e.g., Bargh et al., 2001; Chartrand & Bargh, 1996; Kawada et al., 2004; McCulloch et al., 2008). For example, Mc Culloch et al. (2008) found that an impression formation goal led to the same specific mental operations concerning the associations between traits and behaviors regardless of whether it was induced implicitly or explicitly. However, such work represents only the preliminary empirical testing of this idea. Just as conscious versus nonconscious processing leads to considerably different outcomes across domains (e.g., Betsch, Plessner, Schwieren, &

Gutig, 2001; Dijksterhuis, 2004), we argue here that the role of conscious and intentional activation and guidance in a given goal pursuit may introduce a host of implications that differ in kind and intensity from an unintentionally activated pursuit. If so, the question remains as to whether and *where* such differences emerge, and, importantly, how influential they are on the person's goal progress, reactions, flexibility, etc. In other words, if such differences exist, in what ways are they influential with regard to the pursuit? This question of course also raises interesting connections with the cognitive science literature on the functionality of consciousness more generally (e.g., Baars, 1997, 2002; Damasio, 1999; Morsella, 2005).

We also think it is important to stress the importance of continuing to finesse the methodological tools used to empirically establish unintentional goal pursuit. Any comparison of intentional versus unintentional goal activation and operation of course presupposes accurate measurement of each. And, as is the case with other social psychological constructs that have been deemed "implicit" (e.g., see Gawonski et al., 2007; Gawronski, Hofmann, & Wilbur, 2006), there is often some confusion in the meaning of the term, as we discussed at the outset of the chapter, as well as great variety in the methods that are used to ensure a lack of intention (and sometimes consciousness). At the least, this area of research would benefit from a more rigorous measurement of people's conscious awareness of a goal throughout a given experiment, from the priming phase *through* the dependent measure (see Uhlmann, Pizarro, & Bloom, 2008).

Another important question concerns the boundaries and moderators of implicitly activated goals. One especially striking version of this question is which goal-relevant cue in the environment will win out over others and succeed in driving one's motivated behavior (see Bargh, 2006)? The impetus for this question is undoubtedly the observation that any given environment contains a multitude of potentially goal-relevant cues, and the literature has indeed

shown that many different kinds of cues can implicitly trigger goal pursuit, as we reviewed earlier. But, it is useful to note that even though the environment *seems* bountiful and unlimited, people of course only process a small portion of the available stimuli and cues. For example, we selectively narrow down the seemingly infinite cast of cues according to factors such as relevance, accessibility, salience, and convenience.

A different version of the "selectivity" question is how might implicitly triggered goal pursuits interact with consciously, intentionally chosen ones? The extant work mentioned earlier that has compared the same goal activated either implicitly or explicitly has not found strong evidence for additivity (e.g., Bargh et al., 2001), but these comparisons are rare in number, and the findings may or may not be conclusive. Especially interesting is the question of what happens when implicit goal pursuit *conflicts* with explicit goal pursuit? Which one will win out? There has been surprisingly little research on this question, and yet it seems like one of the more interesting and relevant questions to explore. For example, what happens when we enter into a situation and are consciously trying to cooperate but are exposed to implicit competitive cues? When do the cues wash out and cancel one another? Is there is a distinct temporal profile of the influence of each? Does the conflict between the two increasingly mean that the person becomes aware of the competitive cues (i.e., consciousness is triggered by the conflict)?

Another way to address the question of boundaries is to identify the moderators that matter for both the explicit and implicit pursuit of a goal. There has been some progress on this front. For example, researchers have shown that a person's explicitly reported commitment and valuing of a relationship partner should influence the extent to which that partner implicitly triggers any associated goals (e.g., see Shah, 2003; see also Shah et al., 2002). Researchers have also shown that one's expectancy and valuing of a conscious goal will determine the nature of

the unintended effects of that goal on the accessibility of knowledge (Förster et al., 2005).

Additionally, it seems that a person's expertise at a given goal moderates a variety of implicit

effects of that goal (Ferguson, 2008; Fishbach et al., 2003; Fishbach & Shah, 2006). Finally,

some work has shown that the desirability of a goal, whether normative (Aarts et al., 2004) or

situational (Ferguson, 2008), influences whether that goal can be activated implicitly.

Normatively or situationally-undesirable goals are less likely to influence motivated behavior

implicitly. This work has started to reveal the kinds of factors that predict implicit goal pursuit,

and so far it suggests important limitations on when and how a goal can be activated and then

influence downstream behaviors without conscious intention or awareness.

Conclusions

We have reviewed how motivation is understood and empirically studied from an implicit

social cognitive perspective. We organized the existing empirical literature into two lines. In the

first, we summarized the work showing that an intentional, conscious goal state can lead to a

variety of effects on perception, knowledge accessibility, behavior, and attitudes that are

themselves unintended and sometimes nonconscious. In the second, we reviewed the evidence

that goals can be activated unintentionally, and perhaps nonconsciously, according to a number

of downstream consequences similar to the unintended effects reviewed in the first section.

Finally, we raised a number of theoretical questions that remain unanswered, though we did not

provide an exhaustive list. The "bottom line" of this literature unequivocally calls for a re-

conceptualization of the meaning or definition of goal pursuit. The construct is now divorced

from its historical reliance on conscious intention and monitoring, and many exciting questions

remain to be answered.

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