CHAPTER 3

Conscious and Unconscious

Toward an Integrative Understanding of Human Mental Life and Action

Roy F. Baumeister and John A. Bargh

Human consciousness is one of the wonders of the world. It integrates sensation, perception, emotion, and interpretation, often understanding events in sequences that include causal analyses and extended narrative structures. How inert bits of lifeless physical matter, such as protons, neutrons, and electrons, combine and organize so as to make conscious experience possible remains one of the most unassailable mysteries in the scientific understanding of the universe. Yet consciousness itself is, of course, no mystery for the billions of human beings who have and use it all day, every day.

We, the authors of this chapter, have found ourselves on opposite sides of debates about several important questions, including the efficacy of conscious thought and the scientific viability of free will. Still, we have followed each other's work over the years with interest, respect, and admiration, and this has enabled our programs of research to benefit and to be informed by each other's work. Moreover, we actually agree on far more than our periodic debates might suggest. Our purpose in this chapter is to explore and elucidate these areas of agreement.

POSSIBLE ROLES OF CONSCIOUSNESS

The relation of conscious thoughts to behavior has been depicted in multiple ways, running the full spectrum from complete control to complete irrelevance. Here we briefly delineate the range of possible views.

At one extreme is the commonsense impression that consciousness is in full control of behavior. People know they are conscious. They experience their actions as stemming from conscious choices. Almost by definition, they are unaware of unconscious influences on their behavior. (To borrow a metaphor from Jaynes, 1976, a flashlight in a dark room would mistakenly conclude that all the lights are on, because whichever way it turns to look, everything is illuminated!)

Concerning definitions, *conscious* and *unconscious processes* have been distinguished historically in terms of several different features (e.g., Bargh, 1994)—awareness, intentionality, efficiency, and controllability, with the former two at the heart of the terms in common usage. However, because of mounting evidence that motivations and

goal pursuits (roughly speaking, intentionality) operate unconsciously in much the same way as they operate consciously (e.g., Marien, Custers, Hassin, & Aarts, 2012; McCulloch, Ferguson, Kawada, & Bargh, 2008), the intentionality (purposive, goal-oriented) quality no longer differentiates conscious and unconscious processes. Thus, it is the awareness and reportability of a mental process that most clearly distinguish between what is considered a conscious versus an unconscious mental process or experience. Indeed, the most recent distinctions between conscious and unconscious processes have focused exclusively on the various forms of awareness people have about their mental content (Schooler, Mrazek, Baird, & Winkielman, in press).

The view that consciousness enjoys full control over behavior has mainly intuitive appeal these days. Few serious researchers endorse it, because the case for unconscious causation of behavior is overwhelming. Years ago, Freud (1933/1965) made a persuasive and extensive argument for the position that people are not fully aware of many causes of their behavior, including ones originating in their own unconscious mind. Modern social psychology has repeatedly shown that people are not aware of many situational cues and stimuli that can influence behavior. Nisbett and Wilson (1977) showed that introspection is often unable to furnish accurate accounts of the causation of behavior. Wegner (2002) showed that people's subjective experiences of initiating and controlling behavior can be mistaken in both directions; that is, sometimes people believe they have done something when they have not, and sometimes they believe they have not done something when they have. And, of course, one of us has devoted much of his career to demonstrating a great many ways in which situations cause behavior by means of unconscious, automatic processes, thus bypassing or circumventing any conscious control (Bargh, 1994, 1997, 2005).

A watered-down version of the theory of full conscious control holds that people are at least conscious of what they are doing, and that unconscious processes influence behavior by way of influencing conscious thoughts.

Opposite to the theory of full conscious control is the view that conscious processes have effectively zero impact on actual behavior. The view that consciousness is an *epiphenomenon,* which is to say a side effect of other processes and itself does not have true causal impact, has a long history. Thomas Huxley (1874) articulated the so-called "steam whistle hypothesis" that compared consciousness to the steam whistle on a train locomotive. The steam whistle's activity is caused by what is happening in the engine and may also reveal something about the inner state of the engine, but it does not move or steer the train. By analogy, consciousness may be a rich subjective experience of one's own life that derives from unconscious processes and reveals something about these inner states, but it does not have any influence on behavior.

More recent writers have continued to question the efficacy of conscious thoughts. Wegner (2002) wrote of the "illusion of conscious will," proposing that people's subjective awareness of deciding, controlling, and initiating actions is liberally subject to distortion and error. Dijksterhuis and Nordgren (2006) proposed that unconscious thought is generally superior to conscious thought, and although they conceded that conscious thinking can sometimes cause behavior, its effects are not very helpful, and people would be well advised to minimize its influence. Wilson (2002) likewise provided evidence of the fallibility of conscious thinking and recommended that people rely on unconscious processes rather than conscious ones (see also Gladwell, 2004).

In between the two extremes of seeing behavior as mainly conscious versus mainly unconscious, there are emerging new models that seek to regard conscious and unconscious processes as complementary instead of competing systems. One approach would accept that conscious thoughts are highly influential in guiding behavior, but that unconscious and automatic processes can have considerable influence by means of shaping the content of consciousness. This position is amenable to the commonsense view that conscious thoughts are ultimately in charge of action, but it assigns an important role to unconscious processes as providing support and input.

The other compromise view, which both of us currently advocate, is that behavior is normally carried out by unconscious, auto-

matic processes, while consciousness can occasionally intervene to override, regulate, redirect, and otherwise alter the stream of behavior—often at a distance, with unconscious processes filling in. As Baumeister and Masicampo (2010) proposed, the idea that consciousness plays a supporting (but nonetheless powerful) role in human functioning has lacked traditional advocacy, intuitive appeal, and other advantages of the rival theoretical views, but it may provide the best fit to the currently available evidence. In the next section we spell out this view.

CONSCIOUSNESS AS NAVIGATIONAL SYSTEM

In the 1990s, the two of us engaged in a public exchange of views that we have come to remember as "the steering wheel debate." At this time Bargh, emboldened by early findings to move into what he later characterized as his "feisty period" (e.g., 1997), had shrugged off his initial, cautious view (e.g., 1989) that all effects of automatic and unconscious processes depended on influencing conscious processes in order to reach behavior. He began to speculate that the majority of behavior, and perhaps close to all of it, was the produce of unconscious processes rather than conscious ones.

At the same time, Baumeister had been emboldened in a different direction by his first findings about the importance of conscious control in self-regulation. Although his thinking about conscious control was in a sense the opposite of Bargh's thinking on automatic, unconscious control, both were largely in sympathy with the view that the majority of causes of behavior are in the latter category. Baumeister and Sommer (1997) proposed, however, that even if conscious control were directly responsible for only 5% of behavior, that 5% could make all the difference in long-term behavioral outcomes. By analogy, they suggested that although cars may be driven straight ahead 95% of the time, the 5% of the time that the steering wheel is used to change directions is inordinately important in enabling the car to reach the driver's preferred destination.

Contemplating the importance of a steering wheel dodges a couple of vital questions, including the extent to which conscious processes are themselves the product of unconscious ones. We find it hard to imagine where conscious thought could come from if not from unconscious processes (see Morsella & Bargh, 2010). For example, a person may read a poem or story and be transported into vividly imagined, emotionally rich responses. In order for these to happen, however, the unconscious must accomplish considerable work, including the transformation of the visual stimuli into meaningful words, the evocation of associated knowledge, and initiation of evaluative, emotional responses, perhaps complete with bodily arousal.

To revisit the car metaphor, therefore, we can ask what is the appropriate metaphor for conscious thoughts. The full conscious control metaphor would suggest that consciousness is the car's driver, who works the controls so as to direct the car toward his or her intended destination. The steam whistle view would depict consciousness as a passenger, perhaps in the back seat. The passenger may have a rich subjective experience of the journey but is simply seeing what happens, without having any influence on where the car goes.

In that context, our preferred metaphor would be that consciousness is akin to a fancy navigational system. Unconscious processes mostly drive the car, but occasionally they do not know how to get where they want to go, so they consult the navigational system, which can perform calculations that the driver cannot (see Bongers & Dijksterhuis, 2009). The driver is thus better off, and more likely to reach the destination, because of having used the navigational system, although the navigational system does not directly move or steer the car. Its influence is purely advisory—but quite adaptive and valuable.

In that view, consciousness is not needed for perceiving and understanding the immediate environment, nor is it responsible for the direct execution of action. But (among other things) consciousness can mentally simulate various possible courses of action and their likely, anticipated consequences. The unconscious can use these simulations in deciding what to do and in carrying out these plans for action. The result may well be superior outcomes that are more adaptive and successful than what would have

happened had the person simply responded unconsciously to the situation, without consciously imagining various courses of action.

HOW DOES BEHAVIOR ORIGINATE?

The question of how behavior starts has been a perennial bugaboo for action theory (see Morsella, 2009). Most theorists today accept that cognitions can cause behavior, but many cognitions occur without initiating any behavior, so the step from thinking to doing remains difficult to explain. (And thoughts, too, may be merely an intermediate step between the original causes and behavior.)

The approach emphasized by Bargh and his colleagues has been to see the origins of behavior as they occur in the social situation. External cues may activate automatic, often unconscious processes that produce behavioral responses, for example, in the automatic tendency to mimic or imitate what others in that situation are currently doing (Chartrand & Bargh, 1999). Conscious thoughts may be entirely irrelevant, or they may possibly play a mediating role. This view gets past the problem of how to leap from cognition to behavior, because the cognitions are mainly active in mediating between stimulus and response. The stimulus–response (S-R) link remains paramount, although the responses are driven by the particular mental representations activated by that stimulus, and these representations—the meaning of the stimulus for the individual—may vary from person to person, and from culture to culture.

Situational influences can be perceived consciously or unconsciously. They can initiate behavior. Along the way, many unconscious processes are indispensable, including the coordination of muscle movements that execute walking or speech or writing. Consciousness might possibly be entirely bypassed, but probably in the majority of cases it must at least cooperate with the unconscious execution. For example, walking to the corner store may be executed largely by unconscious processes—or *productions* (Wyer, Xu, & Chen, 2012) —that move first one foot and then the other. But consciousness must at least be sympathetic to the project of walking to the store, to support the unconscious operation of the production of walking. It seems implausible that a person would walk to the store by entirely unconscious causation even while his or her conscious mind was screaming at the feet to turn around.

To be sure, often extensive inner processing mediates between the stimulus and the response (Bargh & Ferguson, 2000). Automatic stereotype effects on judgment and behavior depend on the particular content of the stereotype; different stereotypes of the same social group produce automatic different effects (cf. Devine, 1989; Lepore & Brown, 1997). Perhaps even more important, motivational tendencies within the individual may moderate the impact of stimulus on response. The simple formula that the stimulus causes the response glosses over the fact that the organism's attitudes and values dictate whether any response is called for in the first place. If the person has no relevant motivation—if one really does not care a fig either way—then the situation or event is unlikely to spark action. Insofar as the situation is relevant to the goals, values, fears, and desires of the individual, it will stimulate behavioral responses.

This *asymptote*—apparently unreachable limit—of unconscious effects of stimuli on behavior and other higher mental processes was recognized early on, first by Koestler (1967) and Neisser (1967), then by Bargh (1989) and Srull and Wyer (1986): Although automatic stimulus effects could influence perceptual interpretation, orienting of attention, and other early-stage processes, they could not directly drive responses to the environment, because those were the purview of the particular goal active at that moment. Responses back to the environment, loosely defined to include judgments, as well as behaviors, were determined by the person's current purposes. The classic examples of automatic processes such as typing and driving were, of course, dependent on the person wanting to type something or to drive somewhere in the first place; once that goal was active, then the movement of the fingers to type or the complicated attentional–motoric processes involved in driving operated automatically. Traveling a bit too fast around a curve and suddenly seeing a stop sign ahead causes one's right foot to kick out and slam on the brakes without need for any conscious intention or deci-

sion. But viewing that same stop sign while meandering on a pleasant walk along the sidewalk does not cause one's leg suddenly to kick out, fortunately for any fellow pedestrians nearby. The same stimulus (stop sign) has dramatically different effects depending on one's currently active goals.

Faced with this situation, Bargh (1989) was ready to pack up shop and call it quits regarding the extent of automatic influences of the environment. They seemed, as Neisser (1967) had originally argued, to be limited to early attentional and perceptual processes (pattern detection, figural synthesis) with an asymptotic limit at directly controlling any actual responses. But one last chance of direct environmental control had to be examined before he closed the books on the potential automaticity of higher mental processes: What if the goals themselves could be triggered and put into motion directly by environmental stimuli?

This idea was the heart of the "automotive model" of unconscious motivation, which Bargh (1990) originally presented as just a hypothesis with no supporting data. Soon, however, in collaboration with motivational psychologist Peter Gollwitzer and then-graduate student Tanya Chartrand, a series of studies showed that goals such as achievement and cooperation, activated (primed) outside of awareness by goal-relevant environmental stimuli, produced the same effects on judgment and behavior as when they were consciously pursued (Bargh & Gollwitzer, 1994; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Chartrand & Bargh, 1996). Yes, the goal in place did determine the effects of stimuli on responses, but the goal in place—akin to the steering wheel in the earlier analogy—itself could be automatically activated, and put into motion, by external environmental stimuli. This automatic goal activation was argued to occur in the same way as for other mental representations, such as stereotypes (Bargh, 1990). Conscious intent and awareness of the goal pursuit were not necessary to produce goal-directed behavior, extended over time, a conclusion borne out by much subsequent research (Aarts, Custers, & Marien, 2008; Custers & Aarts, 2010; Dijksterhuis & Aarts, 2010).

So far, so good—and no need for consciousness. Consciousness is entirely dispensable, except perhaps as route of input for situational influences. Remember, behavior happens all the time in animals, without needing anything approaching the sophistication of human conscious control, without requiring our whole, big human frontal cortex. Consciousness is not needed to originate behavior. It can perhaps intervene to change the course of action, to steer it, as it were, but there is no reason at all to assume that actional impulses originate in consciousness. (Note, however, that consciousness *is* needed to understand sentences [but not single words or concepts], so all meanings that come in by sentences require consciousness first to parse them for meaning in order to influence behavior.)

But this is hardly the extent of conscious activity, to enable the unconscious to receive complex messages from the world. (Though it is extremely important given the use of culture as human biological strategy.) The demonstrations of environmental priming effects on higher mental processes such as social perception (including stereotyping), judgment, behavior (as in imitation or emotional contagion), as well as goal pursuit (see reviews in Bargh, 2007), all focus on just one priming effect at a time. This is the nature of laboratory research in which a single phenomenon is isolated for study. But in the buzzing, booming real world out there, multiple primes are constantly present. People are arguably constantly barraged by potential priming influences. Although this huge set of potentials is winnowed down somewhat by the currently active goal, which directs attention toward goal-relevant stimuli and away from others (Neuberg, Kenrick, Maner, & Schaller, 2004), people still face a surplus of riches regarding the prediction of priming effects in busy, real-world environments (see Bargh, 2006). Note that this is the same problem of ecological validity that Skinner and his behaviorist colleagues faced when attempting to generalize the S-R model from the extremely simple rat laboratory environments to the complex social world of human beings (see, especially, Koestler, 1967).

Not only that, but a given stimulus can have multiple priming effects, be relevant to competing goals, and have multiple features triggering conflicting responses. Here is where consciousness, and especially the con-

sciousness bottleneck, comes in very handy. A prominent idea that is gaining consensus today regarding the purpose of consciousness is that it alone is capable of integrating and managing the different response outputs generated by the variety of sensory, information-processing, and motivationally relevant systems housed within the human skin (Morsella, 2005). Take as an example the classic Stroop task, in which words are presented in a variety of colors and one's task as experimental participant is just to name the color of the word as quickly as possible. The single stimulus word *red* presented in blue ink has two task-relevant features (the word meaning and the word color), both processed automatically (one does not consciously have to figure out the meaning of the word *red*, and one immediately recognizes without any deliberation that its color is blue). So to make the correct response "blue," one has to manage the competing responses, select "blue" and inhibit "red." We can all do this (there are very few errors typically made on this task), though it takes a bit longer here (compared, e.g., to the word *five* presented in blue) because of the additional effort to inhibit the competing response.

Now, what if the experimenter comes into your cubicle and tells you from now on you are to say the word itself out loud, and not its color. Again, you can do this at a near perfect level, making few if any mistakes. It might again take you longer to say "red" when that word is presented in blue color, but you still manage to stifle the competing response and make the correct answers. The telling point here is that the stimulus—the word *red* in blue color—is identical in the two versions of the task. The stimulus alone did not drive the response. Moreover, this single stimulus generated two different, competing, task-relevant responses, "red" and "blue," yet you were able to get it right. And even more than that, the task instructions were given to you verbally by the experimenter, not by some internal goal or motivation you had internal and private to yourself. Even for such a simple experimental task as the Stroop effect, there is a whole lot for which consciousness is absolutely necessary and that could not be done without it.

Without consciousness the experimenter could not tell you what to do (see Dennett, 1991). You might have learned the correct responses if there were feedback after each trial (as there often is in the dangerous, real world in which you quickly learn not to touch a hot stove), but this would likely take some floundering around to learn the rule; if someone tells you the rule instead, performance is nearly perfect from the get-go (Dulany, 1968). This illustrates one huge domain of consciousness—that people can share information with each other about the correct responses to make, and that they can thus hand down this information generation by generation. Other animals have to reinvent the wheel during each lifetime and cannot, as humans do, build on the hard-won gains of their ancestors and stand on their shoulders. That consciousness is needed to parse sentences is thus no small potatoes.

In what might be a telling example of ontogeny recapitulating phylogeny, young children first "think aloud" before thinking silently to themselves (Vygotsky, 1934/1986). They use their emerging skills of communicating with others to begin to communicate with themselves; after a few months they can do this silently. Thus, internal conscious thought is born out of social communication, taking oneself as the object or target of the communication instead of another person. The phylogentic implications are transparent, suggesting again that conscious thought processes emerged as a functional outgrowth of members of our species' ability to communicate (especially verbally) with each other.

WHAT ABOUT FREE WILL?

At a 2009 conference, the two of us staged a lively debate about whether the notion of free will is scientifically viable. Although some in the audience seemed to have gotten the impression that our views were miles apart (and even that we disliked each other!), our respective positions were probably much closer than it appeared. It is perhaps unfortunate that terms such as "free will" and "determinism" have acquired multiple meanings and connotations. Although these help to attract multidisciplinary attention, they can mislead and confuse, because different theorists use different definitions and therefore argue past each other.

One traditional understanding of free will is an exemption from causality. Neither of us thinks that that view is promising, particularly for a scientific theory. Indeed, scientific theories are causal theories. Hence, we both assume that all behavior is caused. Baumeister thinks free will is simply a different kind of causation, as compared to physical or billiard-ball causation. There are many forms of causation, so having one more is hardly a major concession or adjustment, especially given that the behavior of humans, unlike the deportment of inanimate physical objects, may be influenced by contemplation of moral principles, legal constraints, anticipated future consequences, socially shared understandings, and other factors not easily reducible to Newtonian physics.

Bargh thinks similarly, that the will is caused and not "free" from causation, and that different answers are given to the question of whether free will exists mainly because of where people choose to cut off the causal chain. For political scientists, external constraints on the individual will, such as use of force or coercion (as in totalitarian regimes), are what matter, and when those are not in play, free will (free from external constraint) is said to exist. (Indeed, as Hannah Arendt, 1978, once said, without the existence of free will in this sense the field of political science itself could not exist.) The causal chain is not traced any farther back than this. For psychologists, however, internal constraints are fair game, so behavior is considered less free, for example, in the case of strong addictions, or difficult-to-overcome compulsions such as hoarding or hand washing. Provocations, too, are understood as mitigating circumstances, such as when angry behavior produced by a strong insult is considered as partially outside the person's control or free will.

The key distinction seems not to be free will per se but the role of conscious processes in producing the behavior. Conscious processes are just as causal as unconscious processes. But for many, especially in the field of psychology, conscious causation is equated with free will and unconscious causation, with the lack of same. This is a long-standing historical position dating back to Watson (1912) and the rise of behaviorism; not for nothing was B. F. Skinner's 1971 book titled *Beyond Freedom and Dignity*. Bargh believes that conscious processes are just as caused as are unconscious processes (see especially Bargh & Ferguson, 2000), so both are equally "free" or "not free" depending on how one defines *freedom*; yet psychologists are not really as interested in the "freedom" question as much as they are interested in the question of whether conscious states themselves are causal (see Bargh, 2013).

Baumeister is interested in the social reality of free will, which includes how behaviors such as self-control, rational choice, and initiative are executed. The implications of belief in free will are also important; as a growing body of work has documented, differences in beliefs about free will contribute to various behavioral outcomes. He thinks that humans do have some traits that differentiate them from other animals—and that most of these, including whatever inner processes commonly go by the name of free will, are adaptations to facilitate culture (see Baumeister, 2005). Hence, his interest is in whether the behaviors associated with free will and beliefs about free will are largely conducive to the effective operation of cultural systems (and helpful to the individuals who seek to survive, reproduce, and otherwise flourish in them).

In any case, we agree that human action is best explained in causal terms. For Baumeister, the issue of free will is whether humans actually make choices from among multiple options that are genuinely possible, which strict Laplacian determinism rules out. (Laplace insisted that there is only one possible future, which is precisely the same as what will actually happen, so there cannot be multiple alternative possibilities.) For Bargh, who believes that these choices, as well as the will itself (goal pursuits), are driven mainly by unconsciously operating processes, the particular flavor of "free will" that matters to psychologists and laypeople alike (but seemingly not to philosophers) is whether choices and behaviors are influenced by what is "now playing" in the conscious Cartesian theater of the mind.

Regardless of the philosophical niceties and the unfortunately emotional connotations of terms such as *free will,* we agree on key issues. The production of action in humans differs in some fundamental ways from the production of action in other ani-

mals. Human action takes into account many factors, such as man-made laws, moral principles, symbolism, expressive meaning, and other factors that are generally presumed to be absent from the causation of animal behavior. Humans are in crucial ways able to conceptualize alternatives to current reality and alternative scenarios in which their own various possible courses of action lead to different (and differentially appealing) consequences, and to use these conscious simulations to inform their own behavior. The challenge for psychology is to elucidate the processes that produce those actions.

DOES CONSCIOUSNESS CAUSE BEHAVIOR?

As we have said, psychology's dominant views about how conscious thoughts influence behavior have ranged and oscillated widely. At some points, the reigning assumption has been that conscious thoughts enjoy extensive control over behavior, and unconscious thoughts have at best indirect effects that depend on influencing the conscious thoughts. At other points, conscious thought has been regarded as a dubious side effect of other processes, lacking scientific viability and pragmatic efficacy.

In recent decades, one of the most influential but also controversial lines of work to impugn conscious control was provided by Libet (1985, 2004). The experiments instructed people to decide arbitrarily when to make a meaningless physical movement and to record the moment of that decision. Findings indicated that brain activity showed an uptick about half a second before the movement and (more important) about 300 milliseconds before the conscious decision. Skeptics of conscious control have used those findings to argue that a conscious decision is not a cause of behavior, because the response is already in motion before the conscious event.

To respond to that interpretation of Libet's findings, Baumeister, Masicampo, and Vohs (2011) conducted a literature search for evidence of conscious causation of behavior. Specifically, they sought experimental work in which the (manipulated) independent variable was a conscious event or state, and the dependent variable was genuine behavior (as opposed to a cognition or emotion). By the logic of experimental design, such findings would generally be regarded as evidence that conscious thoughts cause behavior.

That search yielded a broad variety of findings. The efficacy of conscious states for causing behavior is difficult to dispute in light of that evidence. The patterns of findings reviewed in that work include the following (for full review, see Baumeister et al., 2011). When people consciously imagine future actions, they become more likely to perform them. Mentally practicing difficult or skillful actions improves the quality of subsequent performance. Making specific plans improves likelihood and efficacy of behavior. Rehearsing, ruminating about, or reinterpreting recent events alters how one responds subsequently. Performance on logical reasoning tests is heavily dependent on conscious thought. Taking other people's perspective and empathizing with their feelings or desires alters how one treats them, as does imagining the constraints, pressures, and stereotypes that may impinge on their behavior. Trying to override specific automatic or habitual responses is sometimes effective in altering behavior. Altering views of self can alter how one reacts to subsequent challenges and opportunities. Setting particular goals or interpretively framing issues in a particular way can alter how one deals with them.

None of this evidence contradicts the findings of Libet (2004)—only the (mis)interpretation that Libet's findings disprove the efficacy of conscious thoughts. Baumeister et al. (2011) reported no findings that indicated direct control of muscle movements, independent of unconscious processes, which is perhaps what Libet was searching for. Indeed, Libet's (1985) experimental participants were specifically instructed not to plan when to respond, which arguably eliminated the only role that conscious thought could play in that situation.

The findings are also consistent with Bargh's (1997) assertion that the direct, immediate causes of behavior are almost always unconscious and automatic. They suggest a view in which the unconscious carries out the moment-to-moment execution of behavior, with conscious operating at a remove but offering helpful guidance and insights (akin to the navigational system

model we outlined earlier). Baumeister et al. (2011) pointed out that none of the findings they reviewed indicated causation by conscious thoughts alone. Rather, they depict conscious and unconscious processes working together. Indeed, they speculated that almost every human behavior is the result of both conscious and unconscious processes.

There was also no evidence in all the work reviewed by Baumeister et al. (2011) that behaviors originate in consciousness. They cited a great deal of work, but it was all congenial to the auto-motive theory's account that action begins when external cues activate unconscious motivations and tendencies. Thus, behavior starts with an interaction between the external situation and the internal but unconscious motivational tendencies. Still, it makes a difference whether the possible action is first contemplated and simulated consciously.

Unconscious processes may accomplish the specific execution of specific behaviors in the here and now. Indeed, unconscious processes seem to correspond to "old brain" systems of dealing constantly with present-time dangers and needs, just in order to survive to the next present moment. The various automatic processes discovered in social cognition research over the past quarter-century or so have all been found to lead directly, and unconsciously, to overt behavioral responses (Bargh & Morsella, 2010)—exactly what would be expected if these processes were selected by evolutionary processes because of their adaptive value, because natural selection can only operate on overt behavioral responses. This is why, for example, internal automatic processes, such as automatic attitude activation, have been found to produce immediate muscular, behavioral predispositions to approach versus avoid the attitude object (Chen & Bargh, 1999), and automatic social perceptual activity such as trait concept and stereotype activation have also been found unconsciously to produce behavioral tendencies to act in line with the content of the trait concept or stereotype.

Unconscious processes therefore evolved to guide behavior in adaptive ways in the present moment, and this has the happy advantage of freeing conscious processes to "time-travel" into the past or future, comparing present events to past occurrences through memory processes, and making plans for future circumstances (Bargh, 1997). This would not be a safe thing to do unless unconscious processes were home "minding the store" while consciousness was away in time. Conscious thoughts are therefore very useful in coordinating past, present, and future, such as when contemplation of future goals influences present selection of actions (Trope & Liberman, 2003), or when interpretation or reinterpretation of past events alters how one will respond to a similar situation in the future. The literature review by Baumeister et al. (2011) concluded that one major pattern of conscious causation was indeed the integration of past, present, and future.

Planning is a useful example. Behavior does not originate with a plan, because the very making of a plan is occasioned by some combination of inner motivation and external constraint or opportunity. One only makes a plan because one wants to reach a goal, and reaching it is not guaranteed. For all its powers and merits, the unconscious is probably not capable of making a complex plan itself, so it uses consciousness in order to make the plan. This is probably why people are often kept awake at night, against their will and their strong desire to get back to sleep, thinking about their uncompleted tasks or the yet-unsolved major problems in their life (Morsella, Ben-Zeev, Lanska, & Bargh, 2010). When the conscious mind does form a plan to take care of these unresolved issues, the unconscious stops nagging consciousness about them (Masicampo & Baumeister, 2011).

Once again, in the case of planning, however, conscious and unconscious processes are found to work most effectively together. When consciousness does make a plan, it turns out that the most effective and reliable plan in terms of probability of success at reaching the desired goal is to form "strategically automatic" mental associations concerning future behavior. Gollwitzer (1999) described the most effective type of plan (at least in terms of what has been proven), implementation intentions, as delegation of control to the environment. Plans are, in essence, specification in advance of what one wants to do given a reliable future event or situation. Implementation intentions work by specifying in concrete detail those future circumstances and linking one's

intended course of action to them, so that when the future event occurs, the intended behavior is triggered automatically.

Note in both of these scenarios, in which consciousness sets a goal and the unconscious works to find a path to it (as occurs in incubation or tip-of-the-tongue effects, in which the sought-for answer pops into consciousness only much later; Koriat, 1993; or a future situation–behavior contingency that then unfolds unconsciously upon the future event), that conscious and unconscious processes are working together. Implementation intentions require conscious processes to set them in the first place but, once established, produce the intended behavior efficiently, reliably, and automatically. Plans require conscious work to establish the desired end state and then allow unconscious processes to work out a way to that goal.

Another, related way that conscious and unconscious processes work together is demonstrated by how conscious attentional processes are automatically directed to unusual, unexpected, or (to a lesser extent) novel events, as noted early on by Mandler (1975) in his model of emotion and by Taylor and Fiske (1978) in their work on attentional salience effects in social cognition, and perhaps especially in Shiffrin and Schneider's (1977) pioneering work on the interaction of controlled (i.e., conscious) and automatic (i.e., unconscious) information processing. The unconscious is continually building a model of the world, using mechanisms such as priming and concept accessibility (both chronic and temporary) with fluent processing (low attentional demand) given to events that fit that model (Higgins & Bargh, 1987); this leaves more of one's limited attentional capacity for those events that do not fit the current model. Given these limits, the unconscious monitoring of the world that generates expectancies, explicit and implicit alike, helps conscious resources to be automatically directed where they are most needed and can be the most helpful.

FUNCTIONS OF CONSCIOUSNESS IN AN AUTOMATICALLY DRIVEN PERSON

Thus far we have argued that automatic, unconscious processes are the direct and original causes of most actions—yet conscious thoughts do play a causal role. If behavior starts with impulses originating in the unconscious, and if it is executed by unconscious processes that control movement, what does consciousness do? The answer suggests that conscious thoughts work closely with unconscious ones to produce the optimal behavioral outcomes.

Conscious thoughts can facilitate decision making in several ways. Conscious thoughts are mentally constructed simulations, and as such they can simulate various courses of action and their probable outcomes. These imagined future events are constructed with the help of extensive unconscious work, including retrieval of relevant knowledge from similar past experiences. Also, crucially, the selection among the various options is informed by comparing the affective reactions to each scenario, and these depend on automatic activation of affective associations. People learn from experience partly by having emotional responses to how things turn out, and these leave emotional traces that are activated when they encounter or imagine similar experiences later (see Damasio, 1994, on somatic markers; also see Baumeister, Vohs, DeWall, & Zhang, 2007, on how emotion guides behavior).

Conscious self-regulation (aka self-control) is another possible mechanism by which conscious thoughts can influence behavior. Morsella (2005) argued persuasively that inner response conflicts that involve skeletomotor muscles—thus, ones about physical action—prompt conscious awareness. This suggests that consciousness is important for mediating between conflicting motivations. Several common types of motivational conflict pit a so-called "lower impulse," such as that stemming from animalistic needs and desires, against higher ones, such as moral principles and long-range goals. Self-control typically operates in service of the higher impulse.

Self-control is typically understood as a conscious process, though there are undoubtedly some unconscious forms of self-regulation (e.g., for maintaining bodily and even social and emotional homeostasis; see Bargh & Shalev, 2012, and, of course, we continue to think and insist that conscious processes are themselves constructed by unconscious ones. One way that conscious-

ness can benefit self-control is by simulating the long-term outcome, which can then exert a motivational pull to compete with the more immediately tempting stimulus for the short-term impulse. Thus, the person is tempted by the cake, the drug, the drink, the insulting provocateur, or whatever, any one of which could lead to impulsive action that might be briefly satisfying but regretted in the long run. To enable the higher impulse to prevail, it is helpful to imagine future outcomes that would be thwarted by indulging, such as the fashionably slim self, the nonaddicted self, the nonhungover self, or the nonjailed self. A vivid conscious thought of these desired outcomes can bolster the otherwise feeble wish to do the right thing.

CONSCIOUS THINKING IS FOR TALKING

Our views about the role of consciousness in the genesis of action have changed several times and no doubt may evolve further. But a different approach to the question of what consciousness is for was proposed by Baumeister and Masicampo (2010). One crucial function of human conscious thought may be for communicating (see also Dennett, 1991). Although many things can be done while conscious thought is directed elsewhere, talking does not appear to be one of them (nor does writing!).

Cognitive psychologists and others have long used reportability as a methodological indicator of consciousness. That is, to establish whether some thought is conscious, one ascertains whether the participant can report on it. But few researchers seem to have seriously contemplated the possibility that reportability may be far more than a handy methodological tool—that it may be precisely the central purpose of consciousness in the first place.

The assumption that communication is one central purpose of conscious thought offers a useful solution to several thorny dilemmas. The question of why humans would have evolved their advanced capacity for conscious thought is vexing if one seeks to use it to explain improved control over behavior. As we have said, we both think automatic and unconscious processes do a fine job of executing almost all behavior. There is no evidence that consciousness can dispense with unconscious processes in action. There is no reason to think that natural selection would have favored early humans who were able to be more conscious of their own actions than were their rivals.

In contrast, the adaptive benefits of communication seem uncontroversial. Sharing information is something humans do extensively and deliberately, far more frequently, more extensively, and more effectively than any other species. Early human kin-based groups that could communicate better than others could well have enjoyed profound advantages, so that natural selection might relatively quickly have favored communicative abilities. The idea that communication was the basic human trait that set our ancestors off on their uniquely human evolutionary past can integrate much of what is known. This includes the fact that upright posture (freeing the hands for gestural communication, which preceded speech) preceded the increase in brain size, contrary to early views that the emergence of the large brain was the original basis for distinctively human evolution. Our ancestors began to share information by gesturing, and the gradual but huge increase in information available in the social environment would certainly have created a selection factor favoring increases in intelligence and brain size.

Earlier we noted evidence (e.g., DeWall, Baumeister, & Masicampo, 2008) that logical reasoning seems to require conscious thought (though, as always, in conjunction with automatic and unconscious processes). The presumptive advantages of reasoning would seemingly constitute a possible explanation for why consciousness evolved. With reasoning, too, however, there is a strong case that the driving force has been interpersonal communication and interaction rather than solitary or solipsistic ratiocination. Mercier and Sperber (2011) reviewed the evidence about common lapses, errors, and flaws in human reasoning, and pointed out that these are only flaws if one assumes that the purpose of reasoning is a solitary, dispassionate search for the truth. Instead, they proposed that reasoning evolved primarily for the sake of arguing, in which case many of those seeming flaws appear instead as helpful to the cause of survival.

For example, the *confirmation bias* is a tendency to attend more to evidence supporting one's hypothesis than to evidence contradicting it. Many writers have deplored this as a sad lapse, and an invitation to bias and error. And, of course, scientists who ignore contrary evidence will likely end up with mistaken theories. But people are not intuitive scientists so much as they are intuitive lawyers who want to argue for their position (see Tetlock, 2002). In that case, supportive evidence is much more useful than contrary evidence. A defense lawyer who brought up evidence of her client's guilt would be less successful than one who focused on the facts that supported his innocence. Mercier and Sperber have also suggested that reasoning is for evaluating the arguments made by others—in which case people have a *disconfirmation bias,* which is to say they look eagerly for flaws in the reasoning used by their adversaries in an argument.

There would seem to be clear adaptive advantages in being able to argue in one's own defense within one's social group, as argued in Tetlock's (2002) model of evolved social mindsets. Take as a starting point Gazzaniga's (1985) prescient idea based on hypnosis, as well as early neuroscience research, that impulses to action arise unconsciously and are then interpreted consciously to form a coherent narrative account of what one is doing and why. He noted that people's behavior under posthypnotic suggestion, in which they found themselves down on the floor on all fours because of the hypnotist's command, or getting up from the chair and leaving the room, found immediate rational explanations and justifications ("I lost an earring down here"; "I'm thirsty and want to get some water"). One can imagine how helpful to maintaining one's good graces with one's group, back in the day when ostracism was a certain death sentence, it would be to have readily at hand a positive spin for whatever one was doing or had just done. Without this ready explanation and ability to communicate it effectively, one could be seen as personally responsible and as having intended all of the accidental mishaps (spilling the jar of water on the long walk back from the well, falling asleep and letting the sheep wander away, picking some poisonous berries on a foraging run) that can occur to any of us given the vagaries and uncertainties of life. Indeed, given the strong evidence of the correspondence bias or fundamental attribution error, each of us would be likely to be seen as intending each of these bad outcomes, and situational or circumstantial causes would tend to be dismissed by the group. Thus, we can see a clear case for the adaptive, survival value of being able to give quickly and argue effectively for a positive, pro-group version of whatever one has just done.

Logical reasoning and planning can also be helpful in guiding behavior toward optimal, desired outcomes, and these appear to require conscious thought. As one example, most travelers engage in calculating simulations so as to get to the airport with sufficient time to make their plane (but without so much lead time as to require sitting for many hours in the airport). Knowing one has a 1:35 P.M. flight departure time might dictate arriving at the airport by 12:35 (earlier for big, busy airports), which in turn may require being in the taxi by 12:15, which requires being at the taxi stand by 12:05, which requires being checked out of the hotel room and into the elevator by noon, which requires being fully packed by 11:45 in time to check the room again for potentially forgotten items, which means having an early lunch, and so forth.

CONCLUSIONS

Whatever we may have thought and seemed to say in the past, at present we both think that most human behavior comes from a blend of conscious and unconscious processes working together to meet the person's critical needs and facilitate important goal pursuits. Baumeister et al.'s (2011) survey of the literature turned up no convincing evidence that any action is caused entirely by conscious processes, and it is doubtful that this would even be possible. In principle, a few behaviors could be produced entirely independently of consciousness, and the direct execution of behavior is probably the result of unconscious and automatic processes, but in most cases, consciousness may have some say in the matter, especially with regard to upstream influences such as planning, logical reasoning, interpreting, and communicating.

The unconscious evolved primarily to produce adaptive responses in the immediate present. Conscious processes evolved to do other things. They are necessary for people to time-travel away from the immediate present, especially to anticipate, simulate, and plan for the future. They are necessary to communicate verbally with others, thus gaining a huge competitive advantage for our species in the capacity to share knowledge with others and coordinate individual efforts effectively. One prime adaptive advantage of being able to communicate with others seems to have been the production of good arguments, both to persuade others to help one pursue one's own important goals (or at least not hinder one's pursuits) and perhaps especially to defend one's sometimes deleterious behaviors to one's social group, to avoid retribution and ostracism. Insofar as consciousness evolved to facilitate communication, and human communication continues to take new forms and present new challenges and opportunities, it is tempting to speculate that human consciousness itself may continue to evolve. The mental state that defines human waking activity may be a work in progress.

The two of us have worked separately for many years to emphasize the positive benefits and utility of conscious processes on the one hand, and unconscious processes on the other. We have managed to convince each other of our respective positions, so that we have come to share the view today that both conscious and unconscious processes are important in their own right and in their own domains, but more than that, they need each other to work at all. Neither conscious nor unconscious processes can do it all by themselves: They must rely on each other in much the same way that individual humans do.

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